MATHEMATICA
Policy Research

Evaluation of the Comprehensive Primary Care Initiative

Fourth Annual Report

May 2018

This page has been left blank for double-sided copying.

Evaluation of the Comprehensive Primary Care Initiative

Fourth Annual Report

May 2018

Lead authors:

Deborah Peikes
Grace Anglin
Stacy Dale
Erin Fries Taylor
Ann O'Malley
Arkadipta Ghosh
Kaylyn Swankoski
Jesse Crosson
Rosalind Keith
Anne Mutti
Sheila Hoag
Pragya Singh
Ha Tu
Thomas Grannemann
Mariel Finucane
Aparajita Zutshi
Lauren Vollmer
Randall Brown

Contributing authors (in alphabetical order):

Patrick Balke
Bryan Bernecker
Karen Bogen
Nancy Clusen
Jared Coopersmith
Annie Doubleday
Nancy Duda
Claire Dye
Michael Fields
Tyler Fisher
Jonathan Gellar
Kristin Geonnotti
Sabitha Gopalsamy
Mary Harrington
Shannon Heitkamp
Tricia Higgins
John Holland
Tessa Huffman
Jasmine Little
Rachel Machta
Nancy McCall
Shira Mitchell
Norberto Morales
Nikkilyn Morrison
Brenda Natzke
Victoria Peebles
Dmitriy Poznyak
Eugene Rich
Brianna Sullivan
Xiaofan Sun
Derek Winsor

Submitted to:

U.S. Department of Health and Human Services
Centers for Medicare & Medicaid Services
7500 Security Blvd.
Baltimore, MD 21244-1850

Project Officer: Timothy Day
Contract Number: HHSM-500-2014-00034I\HHSM-500-T0010

Submitted by:

Mathematica Policy Research
P.O. Box 2393
Princeton, NJ 08543-2393
Telephone: (609) 799-3535
Fax: (609) 799-0005

Project Director and Principal Investigator: Deborah Peikes
Deputy Project Director and Principal Investigator: Erin Taylor
Co-Principal Investigators: Stacy Dale and Randall Brown
Reference Number: 50319

This page has been left blank for double-sided copying.

CONTENTS

TABLES

FIGURES

This page has been left blank for double-sided copying.

EXECUTIVE SUMMARY

In October 2012, the Center for Medicare & Medicaid Innovation (CMMI) of the Centers for Medicare & Medicaid Services (CMS) launched the four-year Comprehensive Primary Care (CPC) initiative. The goal of CPC was to improve primary care delivery, health care quality, and patient experience, and lower costs. CPC also aimed to enhance clinicians' and staff members' experience. CMS leveraged the support of 39 other public and private payers to target the transformation of primary care delivery in nearly 500 primary care practices in seven regions across the United States. These practices included more than 2,000 clinicians and served around 3 million patients.

CPC required practices to transform across five key care delivery functions: (1) access and continuity, (2) planned care for chronic conditions and preventive care, (3) risk-stratified care management, (4) patient and caregiver engagement, and (5) coordination of care across the medical neighborhood. CMS specified a series of Milestones to help move practices along the path of implementing the five functions, and it updated the requirements for each Milestone annually to build on practices' progress in the prior year. CMS assessed whether practices met targets set within the Milestones, which were considered minimum requirements to remain in the initiative. Although the CPC Milestones overlap with many of the activities typically included in existing patient-centered medical home (PCMH) recognition programs, CPC did not require practices to have or obtain PCMH recognition, although nearly 40 percent did have this recognition when they applied to CPC. CPC supported practices' transformation with: (1) prospective care management fees and the opportunity to earn shared savings in addition to their usual payments; (2) data feedback on cost, utilization, and quality; and (3) learning support.[1]

This fourth and final report to CMS covers the full CPC intervention period (October 2012 through December 2016). The report examines: (1) who participated in CPC; (2) the supports practices received; (3) how practices implemented CPC and changed the way they delivered health care; (4) the impacts of CPC on clinicians' and staff members' experience; and (5) the impacts of CPC on patient experience, cost, service use, and quality-of-care outcomes for attributed Medicare fee-for-service (FFS) beneficiaries. (See Taylor et al. 2015, Peikes et al. 2016a, and Peikes et al. 2016b, respectively, for results from the first three years of the initiative.)

This Executive Summary provides a brief overview of findings and a more detailed summary of findings in each chapter of the final report.

---

[1] The CPC change package (https://innovation.cms.gov/Files/x/cpcidiagram.pdf) describes the underlying logic of CPC, including the primary and secondary drivers to achieve the aims of CPC and the concepts and tactics that support the changes.

OVERVIEW OF FINDINGS

Effects on Outcomes for Attributed Medicare FFS Beneficiaries

- **CPC reduced hospitalizations and emergency department (ED) visits for Medicare FFS beneficiaries attributed to the CPC practices more than for beneficiaries attributed to comparison practices.**
    - The rate of ED visits and hospitalizations for Medicare FFS beneficiaries grew for both CPC and comparison practices, but growth in ED visits and hospitalizations was 2 percent less for attributed beneficiaries in CPC practices than for those in comparison practices. The favorable difference for ED visits was more pronounced in the last two years of CPC.
- **Medicare expenditures for attributed beneficiaries grew less for CPC practices than for comparison practices, but the savings were not enough to cover Medicare's CPC care management fees.**
    - Medicare expenditures without factoring in CPC care management fees increased for both CPC and comparison practices, but the increase was $9 per beneficiary per month (PBPM) (1 percent) less for Medicare FFS beneficiaries attributed to CPC practices than for beneficiaries attributed to comparison practices. This difference was not statistically significant, and estimated effects became less pronounced over time.
    - After including care management fees, Medicare expenditures increased by $6 PBPM more for CPC practices than for comparison practices. The difference was not statistically significant.
    - There is a 94 percent probability that CPC generated some reduction in Medicare expenditures (excluding the care management fees) during the intervention period. However, our analysis indicates the likelihood that those savings were greater than the average $15 PBPM fee that Medicare paid over the four years is less than 1 percent. In other words, although CPC did reduce Medicare Part A and B expenditures slightly relative to expenditures in comparison practices, it is highly unlikely that these Medicare savings generated by CPC were enough to cover the CPC care management fees Medicare paid.
- **CPC had minimal effects on the limited claims-based quality-of-care process and outcome measures examined.**
    - Differences on most claims-based quality-of-care measures for Medicare beneficiaries were not statistically significant over the course of CPC, except for a small (3 percent) reduction in the likelihood of an ED revisit within 30 days of an outpatient ED visit relative to the comparison group.
- **CPC had little impact on beneficiaries' experience of care.**
    - Findings for Medicare FFS beneficiaries in CPC and comparison practices were comparable on most measures of patient experience, except for an increase in transitional care for beneficiaries in CPC practices.

Effects on Care Delivery

- **Practices engaged in substantial, challenging transformation and improved how they delivered care over the course of CPC.**
  - Overall, the largest areas of improvement were in risk-stratified care management, expanded access to care, and continuous improvement driven by data. Based on data from the annual practice survey, CPC practices' approach to risk-stratified care management was more advanced than that of comparison practices. CPC practices' approaches to other aspects of care delivery were slightly more advanced than those of comparison practices.
  - Practices faced barriers to change, including burden associated with quality monitoring and reporting for CMS and other payers, existing incentives in the FFS payment system that encourage volume of services over efficient use of services, and lack of infrastructure for comprehensive and efficient health information exchange between providers.

Effects on Clinician and Staff Experience

- **Clinicians and staff in CPC practices had largely favorable views of CPC. Although CPC required an intensive amount of work for practices, it did not affect burnout, control over work, alignment of work with training, and job satisfaction among clinicians and staff, favorably or unfavorably.**
  - Eighty percent of responding physicians at CPC practices reported that CPC had improved the quality of care or service they provide to their patients, and if they could do it again, 79 percent would support their practice's participation in CPC. Only 12 percent of physicians would oppose participation in CPC and 9 percent reported not knowing enough about CPC to answer. However, physicians at CPC practices, regardless of whether they would support their practice's participation in CPC, indicated that CPC administrative reporting presented a burden and that the transformation work in CPC was difficult (reported by 44 and 34 percent of physicians that would support CPC participation, respectively).

Supports Provided to Practices

- **CMS and other participating payers provided substantial support for CPC practices and, in general, practices found these supports helped them accomplish the required work.**
  - Medicare FFS and other payers prospectively paid care management fees to practices totaling $479 million over the four-year initiative. Medicare FFS paid 58 percent of the total care management fees to CPC practices. Other payers contributed the remaining care management fees. In the final year of CPC (2016), this funding translated to a median of $179,519 per practice ($50,189 per clinician). These payments accounted for a median of 10 percent of 2016 practice revenue.
  - CMS and 32 of the 36 non-CMS payers that participated throughout the initiative provided data feedback to practices; depending on the payer, the feedback included cost, utilization, and/or quality data reported at the practice level, patient level, or both. Payers in three regions—Colorado, Ohio/Kentucky, and Oklahoma—achieved data aggregation,

producing a single tool that aggregated data across payers each quarter (non-Medicare FFS payers aggregated data first in late 2015 or 2016 and then Medicare FFS integrated its data into those efforts in mid- to late-2016).

  - CMS and its contractors provided practices with a variety of group learning activities, including webinars and all-day, in-person meetings. Regional learning faculty (RLF) also provided individualized coaching to practices they identified as needing additional support. On the 2016 CPC practice survey, 56 percent of practices reported that they had received in-person coaching at their practice site from RLF in the prior six months.

Participation

- **Payer and practice participation remained relatively stable throughout the initiative.**
  - Only three small payers left CPC during the initiative, and by the end of the initiative, 439 (or 87 percent) of the original 502 practices were still participating. Most commonly, practices that left the initiative did so to join Medicare accountable care organizations (ACOs), because CMS did not permit practices to participate in CPC and a Medicare ACO.
  - Many of the payers and practices that participated in CPC are participating in Comprehensive Primary Care Plus (CPC+), another primary care model that began in January 2017 and builds on lessons learned from CPC and other PCMH models. Of the 36 payers that remained in CPC throughout the initiative, 28 joined CPC+. Moreover, 412 of the 422 practices that remained through the end of CPC and were located in CPC+ regions (as well as 15 of the 57 practices that withdrew or were terminated from CPC for reasons other than closing and were located in CPC+ regions) decided to join CPC+.

In the rest of this executive summary, we provide a detailed summary of the key results for each chapter of this report.

DETAILED SUMMARY OF FINDINGS

ES.1. Participation remained relatively stable (Chapter 2)

Payer participation. CMS and 39 other payers, which included private health plans in all CPC regions and state Medicaid agencies in five regions, committed substantial public and private resources to redesign primary care in CPC's seven regions.[2,3] Over the course of CPC, payer participation remained steady in all seven regions—only three small payers left CPC during the initiative (Figure ES.1).[4] In general, payers remained engaged in and committed to the

---

[2] Payers that participated in more than one region were counted separately for each region in which they participated. At the start of CPC, 31 distinct payers participated in CPC in addition to Medicare.

[3] New Jersey and New York were the two regions whose Medicaid agencies did not participate. In addition, the Oklahoma Health Care Authority participated in the Oklahoma region and was counted as a Medicaid participating payer, although it did not provide care management fees to participating practices.

[4] In addition to withdrawals, one participating payer acquired another participating payer (thus subtracting one payer from the total). Moreover, one national payer that was participating in two CPC regions joined in a third region during the first year of the initiative (thus adding one payer to the total).

initiative—most reported sustained or increasing commitment to primary care redesign and to alternative payment more generally during interviews conducted in the summer and early fall of each program year. Demonstrating their continued interest, 28 of the 36 payers that remained in CPC throughout the initiative also joined CPC+, which CMS launched in January 2017 and builds on lessons learned from CPC.

Participating payers included most of their lines of business in CPC, but varied on whether they included self-insured clients. Many of the 26 payers with self-insured clients initially struggled to enroll these clients in CPC. Through concerted efforts to engage self-insured clients, the number of payers reporting that all or nearly all of their self-insured clients participated in CPC doubled from 7 to 14 during the initiative.

Practice participation. CMS selected 502 diverse practices to participate in CPC. These practices included independent and system-owned practices, some practices that were recognized as medical homes and others that were not, and practices of different sizes. Practice participation remained relatively stable throughout the initiative—only 1.8 percent (9 practices) were terminated from the initiative and another 11.2 percent (56 practices) voluntarily withdrew. Among practices that withdrew, the most common reason was to join a Medicare ACO, since CMS did not allow concurrent participation in CPC and any of its shared savings models (29 of the 56 practices), or due to challenges meeting CPC requirements (13 practices). In addition, 5 practices voluntarily withdrew after assessing the terms and conditions of CPC participation early in the initiative, and 6 practices closed.[5] By the end of the initiative on December 31, 2016, 439 practices remained in CPC. Of the 422 of these practices located in CPC+ regions, 412 (98 percent) applied and were selected by CMS to join CPC+, as did 15 of the 57 practices that withdrew or were terminated from CPC for reasons other than closing.[6]

Patient participation. CPC was designed to transform whole practices; as such, CPC practices were expected to deliver the same care to all patients they saw. This included patients of participating payers that were attributed to their practice (for which practices received care management fees), patients of participating payers who were not attributed to the practice, patients of nonparticipating payers, and uninsured patients. The numbers of attributed and total patients were substantial, with attributed patients estimated at 1.1 million (321,000 of these were Medicare FFS beneficiaries), and total patients estimated at 3.1 million across all participating practices in 2016.

---

[5] Several CPC practices also changed their composition during the initiative. Five CPC practices each split into two practices (adding five CPC practices to the total count). Three CPC practices merged with other CPC practices (subtracting three CPC practices from the total count).

[6] Three counties (Putnam, Rockland, and Westchester counties) that were included in the Capital District-Hudson Valley Region in New York for CPC were not included in the region for CPC+. Seventeen CPC practices were located in these counties and thus ineligible to apply for CPC+.

Figure ES.1. CPC regions, Non-Medicare payers, practices, and patients

Changes in CPC participation

Payers
2012: **39**
2016: **36**

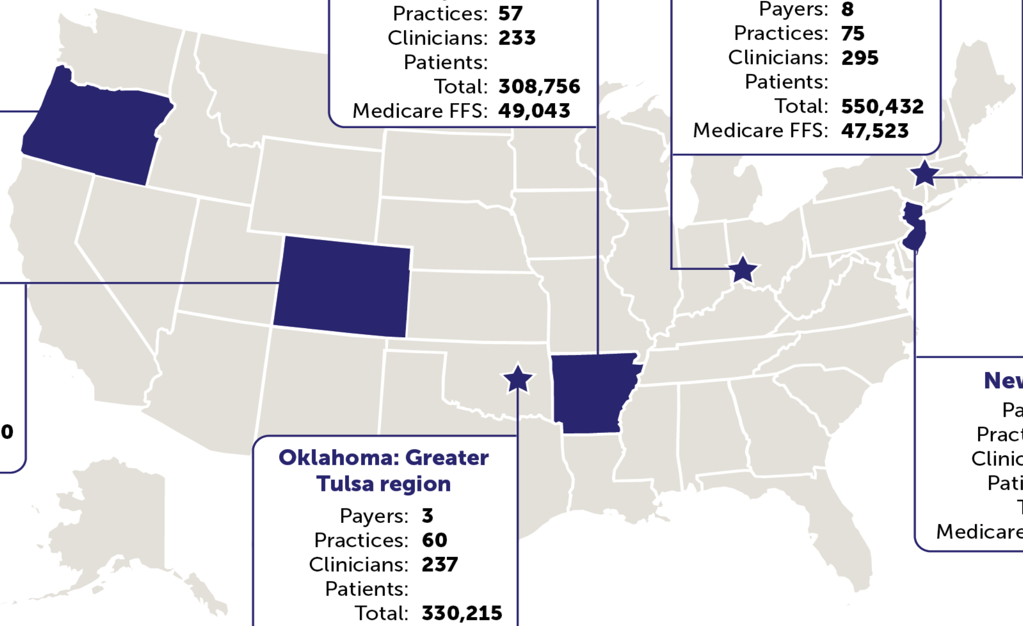
Practices
2012: **502**
2016: **439**

Clinicians
2012: **2,172**
2016: **2,159**

Patients

	Total	Medicare FFS
2013:	**2,544,272**	**326,100**
2016:	**3,053,659**	**320,713**

CPC participation as of December 2016



Oregon
Payers: **5**
Practices: **64**
Clinicians: **551**
Patients:
Total: **532,453**
Medicare FFS: **52,925**

Arkansas
Payers: **4**
Practices: **57**
Clinicians: **233**
Patients:
Total: **308,756**
Medicare FFS: **49,043**

Ohio/Kentucky: Cincinnati-Dayton region
Payers: **8**
Practices: **75**
Clinicians: **295**
Patients:
Total: **550,432**
Medicare FFS: **47,523**

New York: Capital District Hudson Valley region
Payers: **4**
Practices: **63**
Clinicians: **276**
Patients:
Total: **296,460**
Medicare FFS: **39,341**

Colorado
Payers: **8**
Practices: **67**
Clinicians: **366**
Patients:
Total: **408,220**
Medicare FFS: **48,617**

Oklahoma: Greater Tulsa region
Payers: **3**
Practices: **60**
Clinicians: **237**
Patients:
Total: **330,215**
Medicare FFS: **46,099**

New Jersey
Payers: **4**
Practices: **53**
Clinicians: **201**
Patients:
Total: **627,123**
Medicare FFS: **37,165**

Note: Number of payers above reflects non-Medicare payers. Medicare FFS also participated in all regions.

ES.2. CPC delivered substantial financial support, data feedback, and learning supports to practices (Chapter 3)

CMS and other participating payers provided significant support to CPC practices and, in general, practices found that these supports helped them accomplish the work required for CPC. In addition to traditional payments, Medicare FFS and other payers provided substantial non-visit-based financial support for participating practices. CMS and most other payers also provided data feedback to participating practices and, in five regions, payers aligned or aggregated that data feedback across payers in the region. Many practices considered CPC's data feedback useful, but some found it challenging to incorporate into their improvement efforts. Many practices also considered CPC learning supports, which included group learning activities and—for a subset of practices—individualized coaching, important for achieving the aims of CPC.

Financial supports. Medicare FFS and all but 2 of the 36 other participating payers that remained throughout the initiative provided monthly, non-visit-based care management fees to CPC practices, in addition to usual payments for services, to support enhanced, coordinated care.[7] CMS care management fees for Medicare FFS attributed beneficiaries averaged $20 PBPM for the first two years of CPC and $15 PBPM for the last two years.[8] CMS paid higher care management fees in the first two years of the initiative to support upfront investments in practice transformation. Among other payers, care management fee amounts varied considerably but most were lower than Medicare FFS amounts.

According to Medicare FFS payment data and practice-reported data on payments received from other payers, care management fees to practices from Medicare FFS and other payers translated to a median of $7.95 per member per month (PMPM) per *attributed* patient (that is, for patients attributed to practices by CPC payers) or $3.55 PMPM per active patient (that is, patients attributed by CPC payers *and* nonattributed patients).

For the median practice, CPC care management fees totaled more than $175,000 per year, in addition to their regular revenues. This represented more than $50,000 per clinician per year.

Together, this funding totaled $479.1 million over the four-year initiative. Reflecting the decrease in care management fees over time by Medicare and 30 percent of other payers, the median payments to practices (in addition to their regular revenues) were higher in 2013 ($227,849) and 2014 ($203,949) than in 2015 ($175,774) and 2016 ($179,519). Similarly, median payments per clinician

---

[7] One payer provided capitated payments instead of PMPM payments. One payer did not contribute enhanced payments to practices.

[8] CMS paid $20 PBPM in care management fees during Quarters 1 through 9 of CPC (through December 2014), and it paid $15 PBPM from January 2015 onward (for the last eight quarters of CPC). Therefore, over the 17 quarters of CPC, the average PBPM care management fee paid for patients still attributed to a practice was approximately $18. However, the average PBPM fee received in the intent-to-treat (ITT) analysis sample used to estimate the effects of CPC was $15, because we retained all beneficiaries after they were first attributed, even if a practice did not receive fees for them because they were no longer attributed.

decreased from $70,045 in 2013 to $50,189 in 2016.[9] Depending on the year, these payments accounted for 10 to 20 percent of practice revenue. Medicare and about two-thirds of other participating payers also provided practices the opportunity to share in any savings accrued during each of the last three years of the initiative (program year [PY] 2014, PY2015, and PY2016). Medicare FFS calculated savings at the regional level (that is, it compared total costs of attributed Medicare FFS beneficiaries across all CPC practices in a region to an expenditure target); other payers that offered the opportunity of shared savings calculated savings in a variety of ways (including at the regional, system, or practice level, or among groups of unaffiliated practices). CMS's shared savings calculations serve a different purpose than the evaluation and, as such, use a different approach.[10]

Medicare FFS and other payers reported the following shared savings results:

- For PY2014 performance, Medicare FFS found that CPC generated savings in one region—Oklahoma. Medicare FFS shared savings payments to Oklahoma practices totaled $658,129. Across all regions, 10 of the 20 non-Medicare FFS payers that reported results of their shared savings calculations for PY2014 found that CPC generated savings.
- For PY2015 performance, Medicare FFS found that CPC generated savings in four regions—Arkansas, Colorado, Oklahoma, and Oregon. Medicare FFS shared savings payments to practices in these regions totaled more than $13 million. Across all regions, 10 of the 15 non-Medicare FFS payers that reported results of their shared savings calculations for PY2015 found that CPC generated savings.
- For PY2016 performance, Medicare FFS found that CPC generated savings in two regions—Arkansas and Oklahoma. Medicare FFS shared savings payments to practices in these regions totaled more than $10 million. Non-Medicare payers did not report results for this performance year in time for inclusion in this report.

More than three-quarters of practices reported on the CPC practice surveys in 2014, 2015, and 2016 that CPC payments—including care management fees and, when relevant, shared savings payments—were adequate or more than adequate relative to the costs of implementing CPC.

Data feedback. By PY2015, CMS and 32 of the 36 non-CMS payers participating at that time provided data feedback to practices. At the outset of CPC, payers primarily provided practices with individual payer reports.[11] The payers designed the content and structure of this feedback individually, often based on data feedback they were already providing to practices before CPC. Largely in response to practices' input on data feedback, most payers took steps

---

[9] Payments in PY2013 were higher than in PY2014 because PY2013 included several months of CMS payments in late 2012.

[10] See Chapter 3 for information on Medicare and other payers' shared savings methodologies for CPC. See Chapter 8 for information on the methodology used for and results from the CPC impact evaluation.

[11] As part of its evaluation contract, Mathematica Policy Research produced the Medicare FFS data feedback reports and patient-level data files for CMS.

over the four-year initiative to provide new or additional forms of data feedback to practices or to improve existing reports.

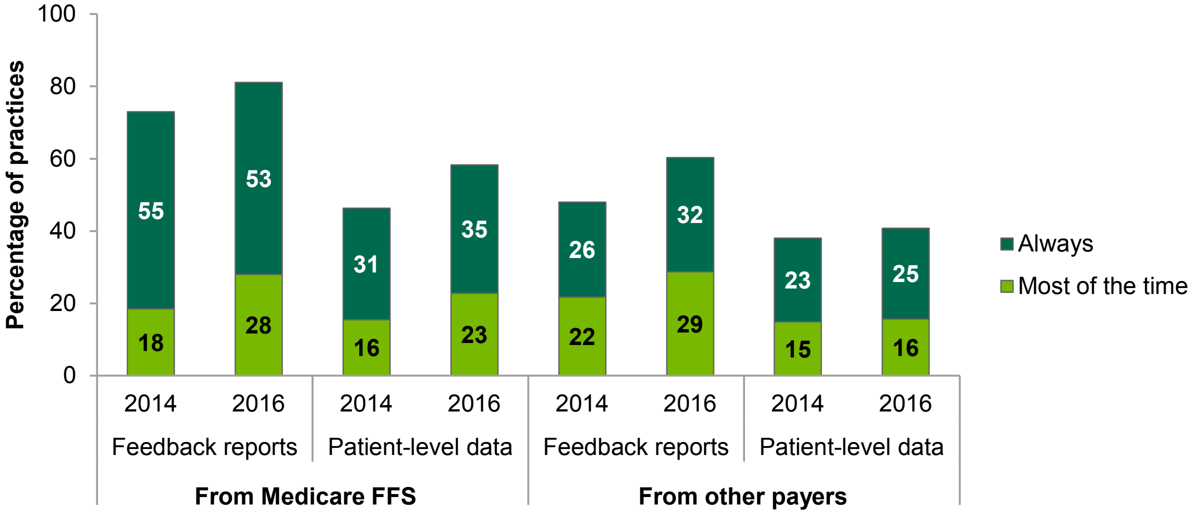
In addition, by the end of CPC, payers in five regions were using a common approach to data feedback. Payers in Arkansas and Oregon took steps to align the cost and service use measures included in individual payer feedback reports with each other and with Medicare FFS. Payers in Colorado, Ohio/Kentucky, and Oklahoma achieved data aggregation—producing a single tool to aggregate data across payers each quarter (non-Medicare FFS payers aggregated data first in late 2015 or 2016 and then Medicare FFS integrated its data into those efforts in mid- to late-2016).

Medicare and almost all other participating payers provided practices with data feedback during CPC.

While important progress was made on providing feedback and refining it over time, areas for improvement include educating practices on using feedback and making feedback more timely and actionable.

Although most practices reported that they had reviewed data feedback, the frequency with which practices reviewed reports varied by report type and over time (Figure ES.2). During interviews with deep-dive practices—a set of 21 CPC practices selected for intensive study throughout the initiative—some of these practices reported that they had used CPC data feedback to identify goals for their quality improvement (QI) work or to improve identification of high-risk patients.

Figure ES.2. Percentage of practices that reported receiving and reviewing CPC data feedback all or most of the time, PY2014 and PY2016



Source: CPC practice survey, administered April through July 2014 and April through August 2016.

Through interviews with deep-dive practices and CMS contractors, and surveys of CPC practices and clinicians, we identified several challenges practices faced using data feedback. Some practices:

- Reported that only staff at the health system level (and not the practice level) reviewed feedback reports; this was reported by health system-owned practices
- Viewed data feedback as complex and difficult to understand
- Lacked the time or skills to use data feedback effectively
- Viewed factors driving high costs as out of their control

Learning support. CMS contracted with TMF Health Quality Institute to provide learning supports to CPC practices. CMS, TMF, and its subcontractors—referred to as regional learning faculty (RLF)—provided practices with a variety of group learning activities, including webinars and all-day, in-person meetings. CMS and its contractors adapted learning activities over time to encourage additional peer-to-peer learning, emphasize the use of data for practice improvement, and engage practices in implementing small tests of change.

Although CPC provided a variety of learning supports, participating practices found in-person learning activities and opportunities for peer-to-peer learning to be the most valuable.

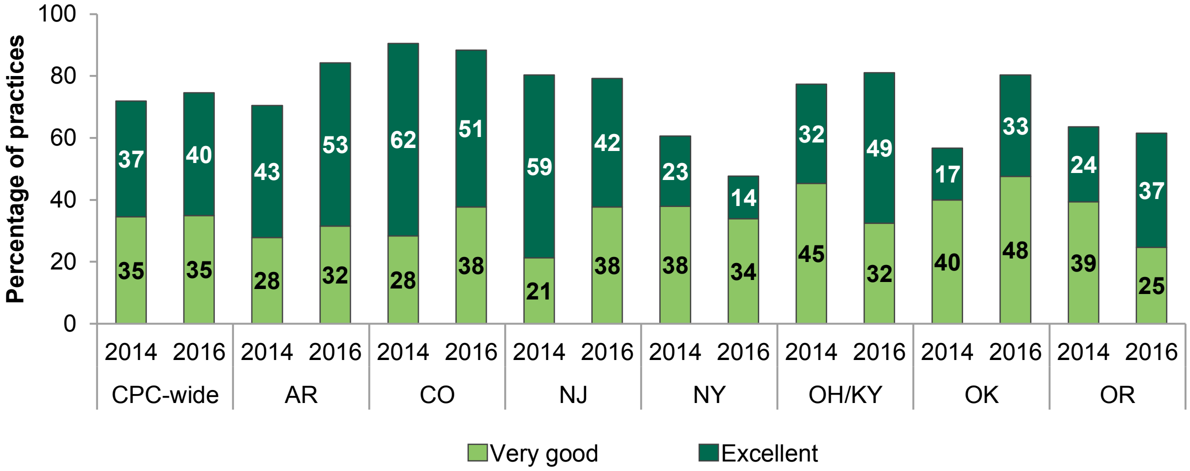
RLF also had limited resources to provide a subset of practices with individualized coaching. RLF selected practices to receive this coaching and adjusted the intensity depending on practices' progress toward CPC Milestones and their performance on quarterly Medicare feedback reports. On the 2016 CPC practice survey, 56 percent of participating practices reported that they had received in-person coaching at their practice site from RLF in the prior six months.

According to the 2016 CPC practice survey, non-Medicare payers also provided coaching or assistance to 71 percent of participating practices in the prior six months. The percentage that reported that they had received this assistance varied considerably by region, from 52 percent of practices in Oregon to 96 percent in Ohio/Kentucky.

In 2016, 75 percent of practices CPC-wide rated their RLF as excellent (40 percent) or very good (35 percent) at meeting their CPC-related needs. The proportion of practices that rated their RLF as excellent, however, varied across regions and over time (Figure ES.3). Most notably, RLF in Colorado consistently received some of the highest ratings, whereas New York RLF generally received some of the lowest ratings, though their ratings still were fairly high.

Practices found that in-person learning activities and opportunities for peer-to-peer learning were the most valuable forms of learning support, according to the practice survey and interviews with deep-dive practices. Although practices valued learning, deep-dive practices also indicated that finding time to participate in learning activities was challenging and some activities (in particular, webinars) were repetitive or were not tailored to meet different practice needs. Practices also noted that electronic health record (EHR) vendors did not participate in learning activities and this limited practices' ability to resolve EHR-related issues.

Figure ES.3. Percentage of CPC practices that rated their RLF as excellent or very good at meeting their CPC-related needs, in PY2014 and PY2016, by region



Source: CPC practice survey, administered April through July 2014 and April through August 2016.

ES.3. CMS and other payers formed collaborative relationships with each other and with practices and other stakeholders to implement CPC (Chapter 4)

CPC was one of the largest and most substantial multipayer initiatives ever tested. For the initiative, CMS, state Medicaid agencies, and private payers committed to providing practices enhanced payment to promote comprehensive primary care. Payers also agreed to work together to develop an approach to align and coordinate data feedback for participating practices. This work required a tremendous amount of coordination and collaboration among participating stakeholders. By bringing together payers and other stakeholders, CPC enabled payers to accomplish several collaborative outcomes, including aligning quality measures, goals, and financial incentives; coordinating common approaches to data feedback; and coordinating CPC with other regional efforts.

Most payers remained committed to CPC and actively engaged in collaborative discussions for the duration of the initiative. Payers generally reported that they established productive, positive working relationships with other payers in their region. According to payers, the following factors facilitated collaboration: prior experience working together, strong facilitation by a neutral payer convener, and leadership from payer champions who spearheaded collaborative efforts and encouraged other payers to commit the needed time and resources to accomplish goals.

From the start of the initiative, CMS encouraged payers to engage practices and patients or patient advocacy groups in their collaborative work and, by PY2015, multistakeholder meetings were the most common forum for discussing CPC. Most payers valued the opportunity to discuss CPC with practices, and to hear more directly about the challenges and successes that practices experienced in implementing the CPC requirements and transforming care. However, in several regions, payers reported that active, sustained practice engagement in multistakeholder meetings was difficult to attain. Payers indicated that multistakeholder meetings would have been more useful if they had more clearly delineated goals for engagement, focused on engaging stakeholders with the time and skills needed to contribute to discussions, and worked to build trust among payers and other stakeholders earlier in the initiative.

> *For successful multipayer collaboration, it is important to clarify the role of various stakeholders and build trust among participants.*
>
> *Adapting an initiative to regional contexts, when possible, is also useful in building support and gaining buy-in from regional stakeholders.*

Most payers viewed CMS as a critical partner in efforts to transform primary care, recognizing its role in encouraging practices to participate in transformation efforts and bringing additional financial and technical support to each region. However, CMS's dual role as initiative convener and participating payer at times made collaboration challenging. CMS was able to build trust with other payers over time by clarifying which parts of CPC could be adapted to regional contexts and deferring to other payers for these decisions, increasing opportunities for payers to meet with CMS representatives, and committing to build on the successes and lessons of CPC in CPC+.

ES.4. CPC changed how participating practices delivered care (Chapter 5)

CPC required participating practices to make many complex, interconnected changes in how they deliver care to their patients, by focusing on five key functions: (1) access and continuity, (2) planned care for chronic conditions and preventive care, (3) risk-stratified care management, (4) patient and caregiver engagement, and (5) coordination of care across the medical neighborhood. To promote progress on these functions, CMS specified a series of Milestones at the start of CPC, and updated the Milestone requirements annually to build on practices' progress in the prior year (Table ES.1). Some Milestones straddle more than one function.

Table ES.1. CPC Milestones for program year (PY) 2016

1. **Budget.** Complete an annotated annual budget with PY2015 revenues/expenses and projected CPC initiative practice revenue flow for PY2016 at the start of the year and report actual revenue/expenses for PY2016 at the end of the year.
2. **Care management for high-risk patients.** Maintain at least 95 percent empanelment to provider and care teams. Continue to risk-stratify all patients, maintaining risk-stratification of at least 75 percent of empanelled patients. Expand care management activities for highest risk patients who are likely to benefit from longitudinal care management and those not otherwise at high risk but requiring episodic care management. Provide information about the care plans that are used for both longitudinal care management and episodic care management. Maintain the implementation of and further refine one of three strategies (behavioral health integration, medication management, or self-management support).
3. **Access by patients and enhanced access.** Enhance patients' ability to communicate 24 hours a day, 7 days a week with a care team that has real-time access to their electronic medical records. Continue to implement asynchronous forms of communication (for example, patient portal and email) and ensure timely responses. Measure continuity of care by measuring visit continuity quarterly for each provider and/or care team in the practice.
4. **Patient experience.** Assess patient experience through patient surveys or patient and family advisory council meetings and communicate to patients (using electronic, poster, pamphlet, or similar communication methods) about resulting changes the practice is making.

Table ES.1 *(continued)*

5. **Quality improvement.** Continue to perform continuous quality improvement using electronic health record (EHR)-based clinical quality measures (eCQMs) on at least three of the measures that practices report annually. Review at least one payer data feedback report (CMS Practice Feedback Report or other payers' reports) to identify a high-cost area and a practice strategy to reduce this cost while maintaining or improving quality.
6. **Care coordination across the medical neighborhood.** Track patients by implementing two of three options: follow up via telephone with patients within one week of emergency department (ED) visits; contact at least 75 percent of hospitalized patients within 72 hours of discharge; and enact care compacts with at least two groups of high-volume specialists.
7. **Shared decision making.** Use at least three decision aids to support shared decision making (SDM) for three preference-sensitive conditions and track patient eligibility for and use of the aids.
8. **Participating in learning collaborative.** Participate in regional and national learning offerings and communicate with regional learning faculty.
9. **Health information technology (IT).** Attest that each eligible professional in the practice is engaged with and working toward attestation for Stage II Meaningful Use in the timelines set by the Meaningful Use program.

Source: CPC PY2016 Implementation and Milestone Reporting Summary Guide.

Across the CPC Milestones, multiple data sources provide clear evidence that practices undertook substantial, challenging transformation and improved how they delivered care over the course of CPC. In the first year of CPC (PY2013), practices worked to set up staffing, initial care processes, and workflows. In PY2014, practices made meaningful progress on each CPC Milestone, demonstrating that they were indeed changing care delivery. PY2015 and PY2016 brought additional refinements to practices' care processes and workflows. Findings across data sources indicate that CPC practices improved most in their work on risk-stratified care management, access to care, and continuous improvement driven by data. However, practices faced challenges in implementing some of the Milestones and, even at the end of the initiative, there continued to be room for improvement in how the practices, and their patients' other providers, delivered care.

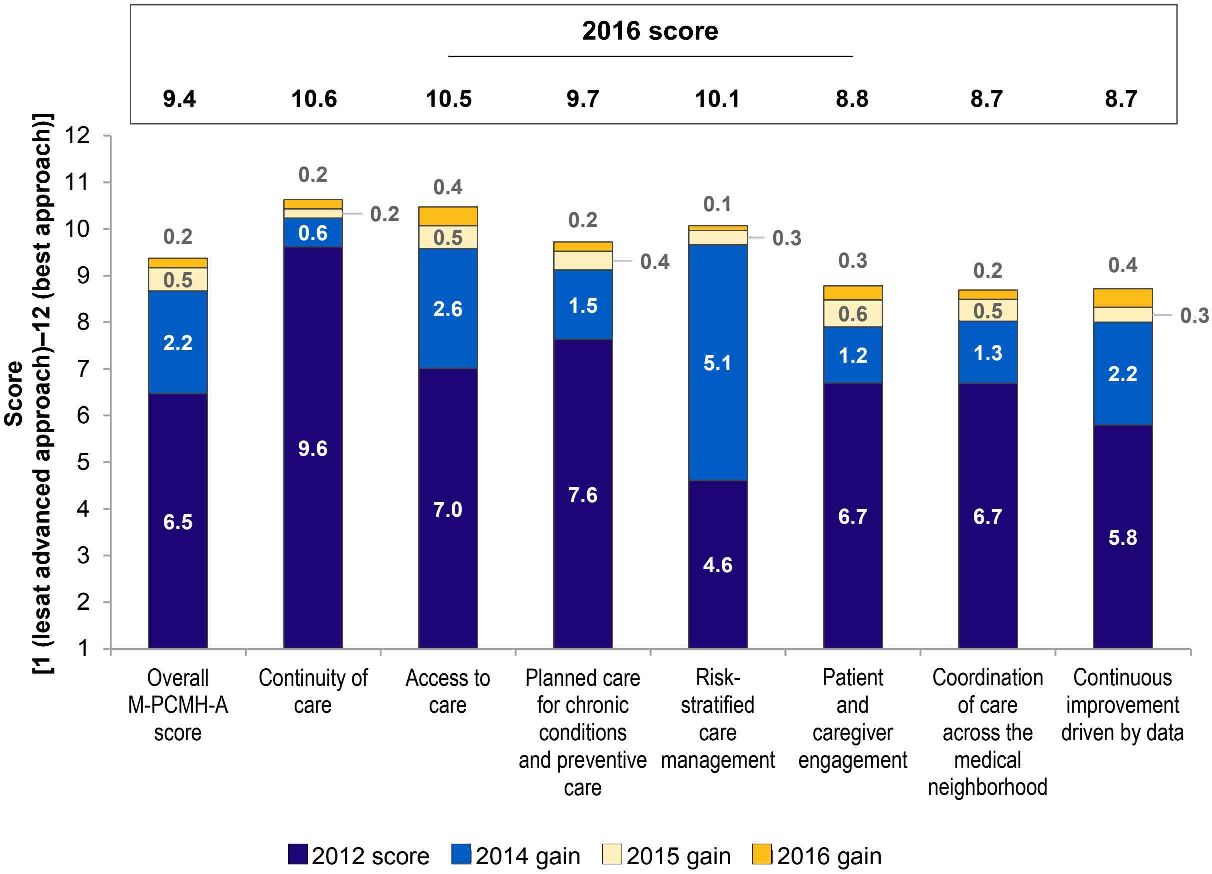
Practices undertook substantial, challenging transformation and improved how they delivered care over the course of CPC.

The largest improvements were in risk-stratified care management, access to care, and continuity of care.

Below are key findings about CPC practices' care delivery approaches from the final year of CPC and notable changes over the course of the initiative:

- **Overall primary care approaches.** As measured by the annual practice survey, CPC practices' approaches to primary care delivery improved each year of the initiative (Figure ES.4). Overall scores on the modified PCMH assessment (M-PCMH-A) included in the survey indicate that CPC practices achieved their largest gains in care delivery between 2012 and 2014. In the final two years of the initiative, they achieved more modest improvements.

Figure ES.4. CPC practices' mean 2012 M-PCMH-A scores, with 2014, 2015, and 2016 gains, for the seven domains and overall

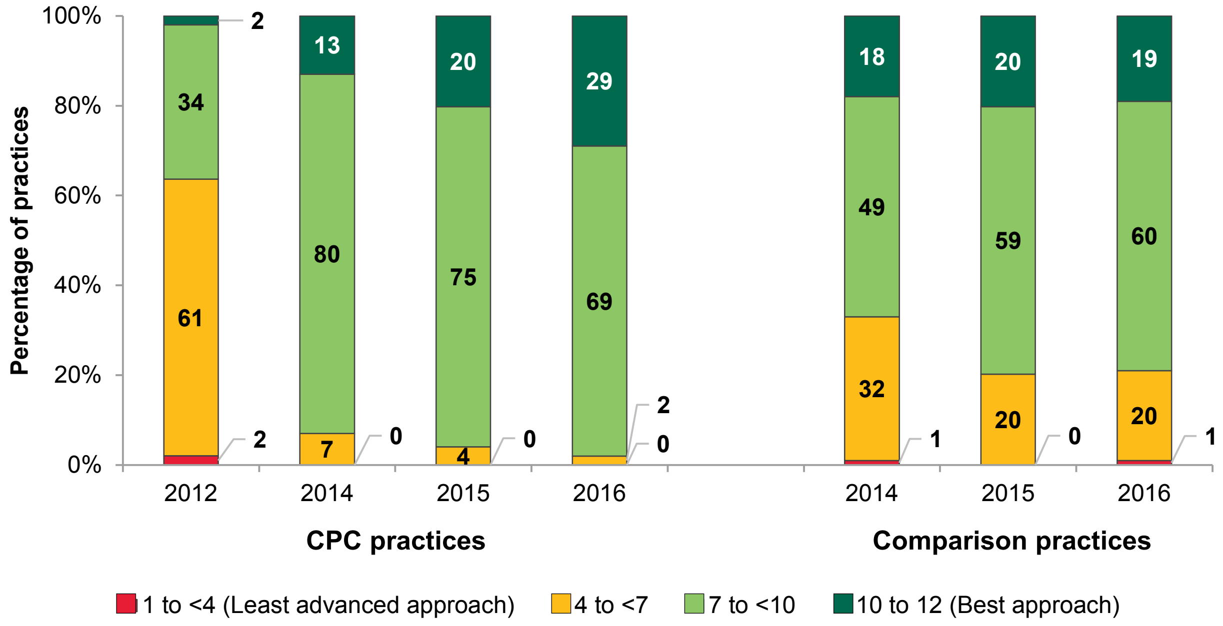


Source: Mathematica analysis of the 2012 CPC practice survey administered October through December 2012, and the 2014, 2015, and 2016 CPC and comparison practice surveys administered April through July 2014, April through August 2015, and April through August 2016. We did not administer the 2012 practice survey to comparison practices.

Note: Scale: 1 [least advanced approach] – 12 [best approach]. We weighted comparison practice responses to ensure CPC and comparison samples were similar and to adjust for nonresponse.

- **Areas of greatest improvement.** Between 2012 and 2016, CPC practices had the largest improvements in risk-stratified care management, access to care, and continuous improvement driven by data. In the remaining four domains—continuity of care, coordination of care across the medical neighborhood, planned care for chronic conditions and preventive care, and patient and caregiver engagement—scores improved to a lesser extent. Gains in each domain increased most during the first two years of the initiative. Comparison practices also showed improvements, though to a lesser degree than CPC practices. In 2016, the last year of CPC, 29 percent of CPC practices had overall scores indicating the most advanced approaches to care delivery (scores of 10 to 12) compared to 19 percent of comparison practices (Figure ES.5).

Figure ES.5. Distribution of CPC and comparison practices' overall M-PCMH-A scores over time



Source: Mathematica analysis of the 2012 CPC practice survey administered October through December 2012, and the 2014, 2015, and 2016 CPC and comparison practice surveys administered April through July 2014, April through August 2015, and April through August 2016. We did not administer the 2012 practice survey to comparison practices.

Note: Scale: 1 [least advanced approach] – 12 [best approach]. We weighted comparison practice responses to ensure CPC and comparison samples were similar and to adjust for nonresponse.

- **Correlation with practice characteristics.** As in prior years, patterns of care delivery reported on the practice survey by CPC practices in 2016 generally did not correlate with practice characteristics (such as practice size, practice ownership, rural/urban status, and how the practice compensated clinicians) or with CPC funding per clinician.
- **Types of practices that improved the most.** CPC appears to have helped some practices improve their approaches to care delivery more than others between 2012 and 2016. The three types of practices that showed the most improvement are those that (1) had lower scores on the practice survey at baseline, (2) were not a recognized PCMH before CPC, and (3) were rated in the bottom two-thirds of CMS scores for their application to participate in CPC (Dale et al. 2016). All three groups had lower average scores in 2012 than CPC practices overall; therefore, these practices may have achieved larger increases because they had more room for improvement.
- **Care management for high-risk patients (Milestone 2).** Increased capacity to provide care management services to high-risk patients was perceived as the biggest benefit of CPC participation and was the area of greatest transformation for CPC practices. Most of this progress occurred between 2012 and 2015.

- By 2016, CPC practices had stopped making major changes to their risk-stratification methodologies. Similar to 2015, practices used a combination of data sources to risk-stratify their patients, most commonly clinical intuition and clinical algorithms.
- In the second half of CPC, practices increasingly integrated care managers' work with clinicians, which had been a challenge earlier. Clinicians developed trust in care managers to handle patient follow-up after observing how care managers' efforts improved patients' adherence to recommended treatments, reduced the need for clinicians to handle this task, and allowed clinicians to focus on more complex clinical care.

  As in previous years, challenges with care management remained, such as:

  - Care managers in several deep-dive practices performed numerous tasks in addition to the activities under Milestone 2. In some cases, this resulted in turnover because care managers felt overwhelmed.
  - Although CPC did not require practices to develop or maintain care plans, they were asked to provide information about care plan use for longitudinal and episodic care management. The use of care plans remained uneven, and clinicians and care managers in most deep-dive practices continued to report limited EHR functionality for supporting care plans and care management.
  - A few respondents were frustrated about multiple guidelines and different requirements for care plans from various payers and medical home initiatives.
  - Duplication of patient outreach by practice-based care managers and those affiliated with hospitals, health systems, health plans, or visiting nurses associations continued to confuse patients and frustrate care managers in both CPC and comparison practices.

Although CPC practices made considerable progress in their care management activities, areas for continued improvement include:

- *Clarifying care manager roles and responsibilities*
- *Improving EHR functionality for care management and care plans*
- *Streamlining guidelines and requirements for care plans*
- *Streamlining patient outreach by multiple care managers from different providers and health plans*

- **Behavioral health integration (Milestone 2).** To identify patients for behavioral health support, CPC practices most commonly used screening tools, staff or provider referrals, and patient self-referrals. They most commonly delivered behavioral health services by providing (1) referrals to specialty mental health care, (2) primary care management with referral as needed to specialty mental health care, or (3) co-management between primary care and specialty mental health care. Practices built internal capacity to provide behavioral health screening and services: the proportion of practices with behavioral health specialists, clinical psychologists, or social workers on site increased from 19 percent in 2014 to 29 percent in 2016. However, co-location of such staff varied across CPC regions from 3 to 52 percent. Over half of CPC practices with co-located behavioral health staff reported that these staff were fully integrated into primary care workflows, shared patient records, and were available for warm hand-offs and acute primary care visits.

- **Access by patients (Milestone 3).** To improve access and continuity, most CPC practices reported in the 2016 practice survey that they offered same- or next-day appointments and had an on-call clinician available with access to the EHR 24 hours a day, seven days a week. As in previous years, nearly all CPC practices reported using patient portals to improve access, partly because the Stage 2 Medicare and Medicaid EHR Incentive Programs (Meaningful Use) emphasized patient portals. However, in 2016, few Medicare FFS beneficiaries reported that they used these portals regularly. Practices continued to improve wait times for appointments; telephone access to the practice; and after-hours access to clinicians via email, telephone, or in-person contacts. Nevertheless, beneficiaries did not report improved access in CPC or comparison practices.
- **Patient experience (Milestone 4).** To improve patients' experience in the final year of CPC, 80 percent of practices conducted patient surveys and 48 percent convened patient and family advisory councils (PFACs) in 2016. Practices' use of PFACs increased throughout CPC, especially between 2013 and 2015. Challenges with surveys included the burdens of collecting and analyzing data, and concerns about data quality. Challenges with PFACs included scheduling, ensuring that a representative group of patients attended, and reassuring patients that their participation was valuable and the practice would use their feedback. Patient respondents who participated in PFACs reported in qualitative interviews that the PFACs' suggestions led to multiple practice improvements around patient outcomes, patient satisfaction, and patient education.

Practices most commonly used patient experience data from surveys and/or PFACs to:

- *Improve the customer service orientation of staff*
- *Change scheduling, hours, or appointment types*
- *Improve communication with patients*

- **Quality improvement (Milestone 5).** As in previous years, QI remained a major focus for both CPC and comparison practices in 2016. Over time, more CPC and comparison practices reported that all staff share responsibility for QI, as opposed to relegating this work to a QI committee or department. And 40 percent of practices involved patients or caregivers in identifying QI ideas or opportunities. The 2016 clinician and staff survey indicated that two-thirds of CPC and comparison physician respondents were involved in QI work. Consistent with prior years, in 2016, deep-dive practices typically used ad hoc approaches for practice-level QI; systematic approaches were more common in large and system-owned practices.
- **Electronic clinical quality measures (Milestone 5).** Most CPC practices focused QI activities on a narrow set of eCQMs over time. In 2016 and 2015, the eCQMs they most commonly focused on were poor control of hemoglobin A1c among patients with diabetes, colorectal cancer screening, and breast cancer screening. In past years, practices noted that tracking eCQMs was helpful for QI, but standardizing data entry across providers into the EHR, analyzing the data, and developing QI processes were resource-intensive. Having dedicated staff to support eCQM documentation and analysis as well as changes to care processes facilitated QI.
- **Care coordination (Milestone 6).** CPC helped practices make considerable progress in providing care coordination and follow-up after hospital or ED visits. Practices made progress in building relationships and exchanging information with hospitals about patient

discharge. However, several deep-dive practices reported ongoing challenges with accessing hospital records and receiving complete and timely information about their patients from hospitals. According to the practice survey results, there were increases in receipt of information on patients from community hospitals and EDs within 24 hours. In 2016, Medicare FFS beneficiaries at CPC practices were more likely than beneficiaries at comparison practices to report that the provider's office contacted them within three days of their most recent hospital stay (60 versus 50 percent) or within one week of the most recent ED visit (59 versus 51 percent). Practices also noted expanded follow-up with patients after hospital and ED discharge and emphasized the importance of care managers in addressing the needs of high-risk patients.

- **Care compacts (Milestone 6).** In addition to working on follow-up after hospital and ED discharge, by the end of the initiative, 41 percent of CPC practices also had chosen to work on care compacts or collaborative agreements with other providers. Practices typically established care compacts, or collaborative agreements, with specialists to which they most frequently refer patients. Most care compacts outlined expectations for referrals and communication between primary care and specialists. A few practices noted that some specialists struggled with multiple collaborative agreements due to variations in requirements among the referring groups. Practices in systems with system-wide EHRs reported that care compacts were less important because all clinicians in their system could view patient information.
- **Shared decision making (Milestone 7).** Practices implemented shared decision making (SDM) slowly in the early years of CPC, in part due to confusion about the concept of preference-sensitive conditions, but use of SDM increased steadily. The percentage of CPC practices that reported that they consistently used patient decision aids (PDAs) to help patients and providers jointly decide on treatment options increased from 42 percent in 2014 to 62 percent in 2016 (compared to 25 percent among comparison practices). The top conditions selected for SDM in 2016 were colorectal cancer screening, prostate cancer screening, tobacco cessation, and mammography. According to some practices, the quality of patient care improved with SDM. However, there was room for improvement in providers' and staff members' understanding of preference-sensitive conditions, providing SDM without overwhelming clinicians, and tracking PDA use and SDM discussions in EHRs.
- **Learning collaborative (Milestone 8).** Similar to previous years, CPC practices greatly valued learning and sharing with other practices in the CPC learning collaborative.
- **Health IT (Milestone 9).** CPC required practices to use EHRs certified by the Office of the National Coordinator for Health Information Technology (ONC). In 2016, all CPC practices attested that their eligible providers were working toward Stage 2 requirements for Meaningful Use. CPC practices continued to face challenges in obtaining and exchanging timely data from providers outside their practice or system. Health information technology (IT) challenges affected care plan use and care management activities, practices' ability to follow up in a timely way with patients discharged from the hospital or ED, and practices' capacity to track the outcomes of SDM discussions.

- **Patient dismissals.** Some practices had suggested that an unintended consequence of CPC's rewards for improving patient outcomes might be to tempt *other* practices to dismiss patients with poor outcomes. However, CPC practices and comparison practices reported dismissing patients rarely, at similar rates, and generally for similar reasons. Thus, participation in CPC did not appear to make practices more likely to dismiss patients.
- **Perceived benefits of CPC by clinicians and staff in CPC practices.** Over the course of CPC, deep-dive practice members increasingly perceived benefits to the quality, delivery, and organization of patient care from working on CPC Milestone requirements. A large proportion of clinicians and care managers gave CPC high ratings.
- **Factors facilitating implementation.** Several practice strategies that cut across the Milestones facilitated CPC implementation. Over time, deep-dive CPC practices increasingly reported *holding regular meetings* (at least monthly) to engage and continue to involve staff in CPC. By the end of the initiative, several deep-dive practices also reported that they had identified a practice leader, in some cases a physician, or small committee, to act as a *CPC champion*, helping to introduce new concepts to the practice and to integrate CPC-related changes into workflows. Finally, *establishing care teams* that worked regularly together and clearly outlined clinician and staff roles helped meet patients' needs.
- **Barriers to implementation**. Barriers to CPC implementation included the burden of integrating numerous required changes into practice workflows, which particularly affected care managers. Practices also struggled with the volume of administrative and quality reporting, including different reporting requirements across payers. In addition, practices reported it was hard to engage patients in care management activities (across a range of areas related to behavior modification, adherence to treatment regimens, and setting health goals); efforts to reduce inappropriate ED use; SDM; PFACs and patient surveys; and patient portals. Some practices found that enhanced self-management support, increased use of motivational interviewing, and teamwork helped them better engage patients in their own care.
- **Mixed facilitators and barriers.** Some factors, such as system ownership, facilitated the implementation of CPC in some cases, and served as a barrier in others. For example, system-owned practices (and practices in regions with robust local health information exchanges) reported that they had reliable, timely access to patients' hospital and ED records, and in some cases, enhanced information exchange with specialists. However, practices described challenges obtaining timely electronic information from unaffiliated providers in order to coordinate patient care with them. System ownership also benefited CPC implementation by giving access to centralized QI resources, in some cases including CPC project managers, which facilitated practice-level change. However, system ownership sometimes created administrative and bureaucratic barriers to making improvements based on patient feedback and making Milestone-related decisions, such as selecting SDM topics to pursue.

ES.5. Clinicians and staff in CPC practices had largely favorable views of CPC. Although CPC required an intensive amount of work for practices, it did not affect burnout, control over work, alignment of work with training, and work satisfaction among clinicians and staff, favorably or unfavorably (Chapter 6)

The CPC initiative aimed to transform care delivery and ultimately improve the experience of physicians, other clinicians, and staff in CPC practices by providing them with more resources and better ways to support the delivery of primary care to their patients. At the same time, practice transformation efforts like CPC require intensive work, including substantial change to practice workflows and staffing, shifting from a physician-centric to a team-based culture, and creating new clinical and administrative tasks. Therefore, there was concern that CPC might add to physicians' burden, worsen their experience, and increase job dissatisfaction, at least in the short run.

Through a CPC clinician and staff survey fielded 11 months and 44 months after CPC began, we examined whether primary care physicians in CPC practices experienced their work differently from primary care physicians in comparison practices, how other members of CPC practices experienced their work, and whether experience changed over time. We focused on five domains: (1) burnout, (2) control over work, (3) alignment of work with training, (4) work satisfaction, and (5) for clinicians and staff at CPC practices, ratings of CPC. We obtained survey responses from a sample of roughly 600 physicians in CPC practices and 500 physicians in comparison practices and over 2,000 other members of CPC practices (nurse practitioners and physician assistants [NPs/PAs]), care managers or care coordinators, medical assistants, nurses, practice managers or supervisors, and receptionists or appointment clerks).

Overall, there were no meaningful differences on measures of burnout, control over work, alignment of work with training, or work satisfaction between physicians in CPC and those in comparison practices in 2016, the last year of CPC, or over time among CPC physicians, NPs/PAs, and staff. Furthermore, there were no differential effects of CPC on physicians whose practices were in a system, were larger (measured by having more primary care clinicians), or served high-risk Medicare beneficiaries across most measures. Together, these findings indicate that CPC did not affect these aspects of clinician and staff experience.

Comparing physicians in CPC practices and comparison practices, there were no meaningful differences on measures of burnout, control over work, alignment of work with training, or work satisfaction during the initiative.

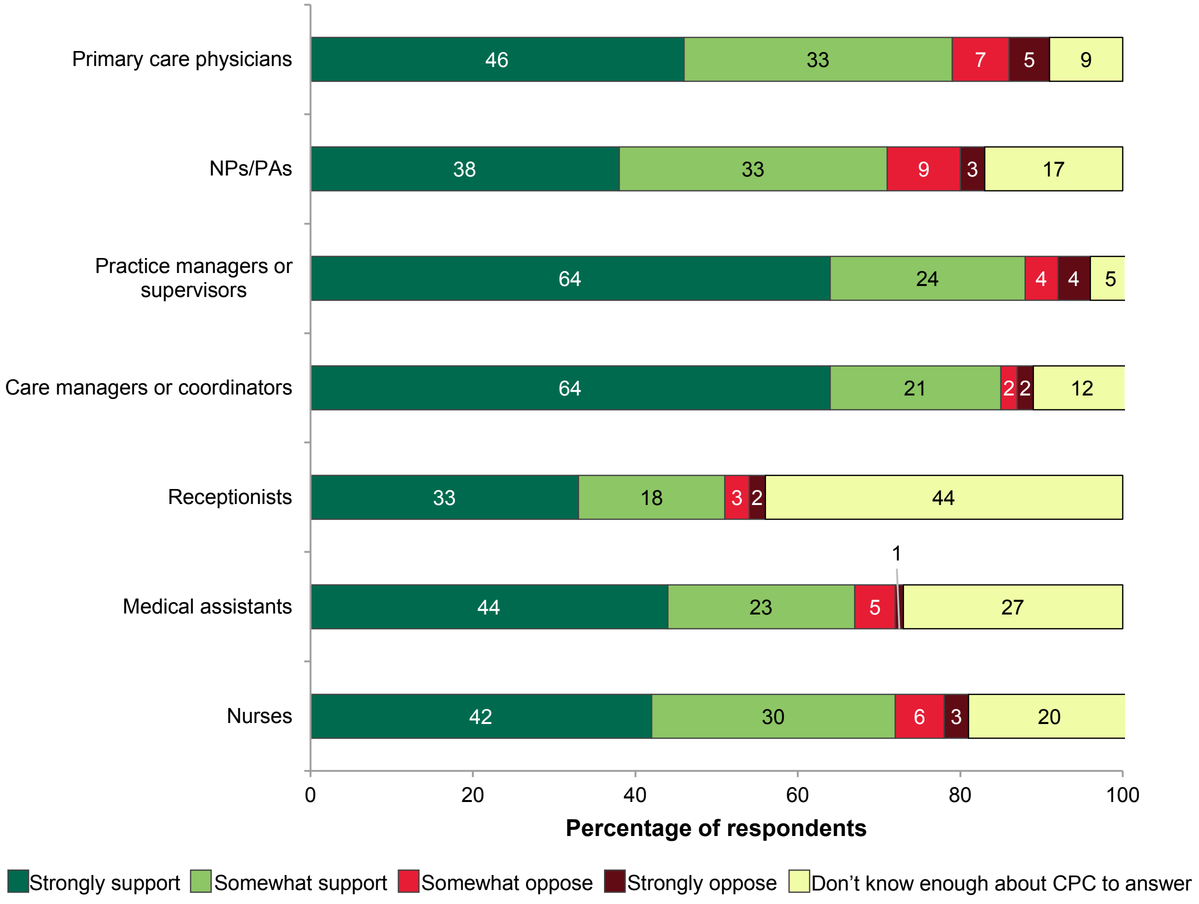
Although CPC did not have differential effects on physicians in practices that were part of a system, had different numbers of primary care clinicians, or had higher-risk beneficiaries, we did find differences among subgroups of physicians when we combined CPC and comparison physicians for analysis. Physicians whose practices were part of a system reported that they had less control over their work, and they spent less time doing work that was well matched to their training and more time doing work that someone with less training could do; in addition, they were less likely to report being satisfied with their current job than physicians whose practices were not part of a system. Physicians in larger practices reported that they had less control over their work than physicians in solo clinician practices, and physicians in practices with lower-risk beneficiaries were less likely to report being satisfied with their current job than physicians in practices with higher-risk beneficiaries.

CPC physicians, NPs/PAs, and staff had largely positive views about their experiences participating in CPC. For example, in 2016, 80 percent of physicians reported that CPC had improved the quality of care or service provided to their patients, and if they could do it over again, 79 percent would support participation in CPC. Only 12 percent of physicians would oppose participation in CPC and 9 percent reported not knowing enough about CPC to answer (Figure ES.6).

Physicians, clinicians, and staff in CPC practices had largely positive views of CPC.

- *80 percent of physicians in CPC practices reported that CPC had improved the quality of care or service provided to their patients*
- *If they could do it over again, 79 percent of CPC physicians would support participation in CPC.*

Figure ES.6. CPC practice members’ reports of how much they would support or oppose their practice’s participation in CPC if they could do it all over again, 2016



Source: Mathematica analysis of 2016 CPC clinician and staff surveys.

Note: We did not statistically test the differences in responses between respondent types.

Among physicians that would support their practice's participation in CPC, the most common reasons for supporting CPC were: they believed work on CPC Milestones helped practices make positive changes and improve patient care (81 percent), they valued the opportunity to contribute to primary care practice transformation (52 percent), and the financial support provided by CPC was sufficient to support their participation (52 percent). Still, even supporters reported that CPC administrative reporting was a burden and that the transformation work in CPC was difficult. Forty-four and 34 percent of physicians that would support their practice's participation in CPC again, reported this, respectively. Additionally, about one-third of these physicians reported inadequate financial support as a reason to oppose CPC participation, and one-quarter reported inadequate staffing.

ES.6. CPC had little impact on Medicare FFS beneficiaries' experience of care, and findings for CPC and comparison practices on most measures of patient experience were comparable (Chapter 7)

Patient-centeredness was a core tenet of the CPC initiative, and several aspects of CPC aimed to improve patients' experience by transforming care delivery. Specifically, practices were expected to improve access to care, engage patients to guide QI through regular patient surveys and/or a PFAC, integrate into usual care culturally competent self-management support and SDM tools, and coordinate care across the medical neighborhood. Practices were also encouraged to use a personalized plan of care for high-risk patients. In addition, CMS and some other participating payers used patient experience as an element in determining practice eligibility for shared savings payments.

We present results based on survey responses from more than 25,000 Medicare FFS beneficiaries in roughly 500 CPC practices and 8,000 beneficiaries in roughly 800 comparison practices in each survey round. The survey was based on the Clinician and Group Consumer Assessment of Healthcare Providers and Systems 12-Month Survey with Patient-Centered Medical Home supplemental items (CAHPS PCMH, version 2.0), and included several additional questions about specific aspects of CPC. We examined how beneficiaries' ratings of CPC practices compared with ratings of comparison practices in 2013 (8 to 12 months after CPC began) and again in 2016 (5 months before CPC ended).

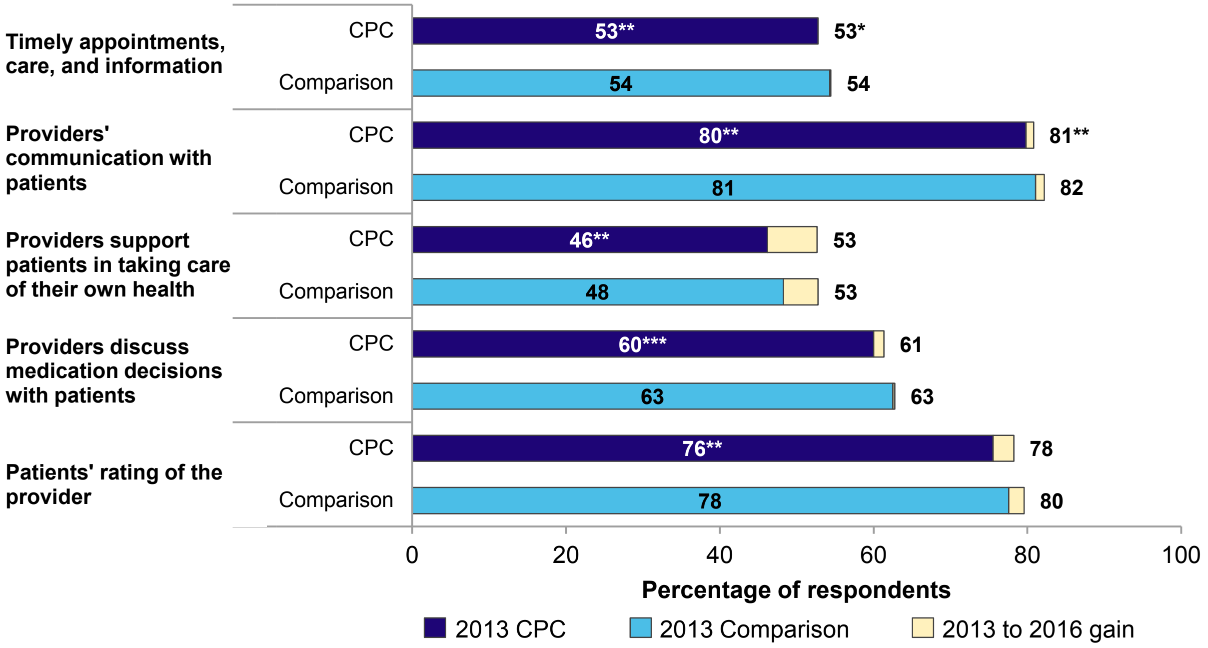
Despite the fact that CPC practices undertook substantial changes to improve care delivery, beneficiaries' ratings of CPC and comparison practices were comparable across most areas of care measured in the patient survey. In 2013, 8 to 12 months into the initiative, beneficiaries in CPC and comparison practices gave similar ratings for each of the five summary composite measures: (1) timely appointments, care, and information; (2) provider communication; (3) providers support patients in taking care of their own health; (4) providers discuss medication decisions with patients; and (5) patients' rating of the provider (see Figure ES.7). In 2016, beneficiaries' ratings of CPC and comparison practices were again comparable across all five composite measures, indicating that CPC did not improve beneficiaries' experiences as captured by these measures. Furthermore, there

Medicare FFS beneficiaries in CPC and comparison practices gave largely similar ratings of their patient experiences.

The exception is that more beneficiaries in CPC practices than comparison practices reported receiving timely follow-up care after hospitalizations and ED visits.

were no differential effects of CPC on beneficiaries who (1) were in practices in systems, (2) were in larger practices (measured by having more primary care clinicians), or (3) had higher risk scores.

Figure ES.7. Percentage of Medicare FFS beneficiaries who gave the best response in 2013 and 2016, for five composite measures, CPC and comparison practices, CPC-wide



Sources: CPC patient surveys administered June through October 2013 and July through October 2016.

*/**/*** The percentage of beneficiaries who gave the best response was statistically different between CPC and comparison beneficiaries in the given year at the 0.10/0.05/0.01 level, respectively, but the difference was small.

Responses to 28 questions asked in 2016 that were not in the composite measures further support the finding that over the course of the four-year initiative, beneficiaries' experiences with care were generally comparable in CPC and comparison practices. Exceptions indicated CPC practices provided better transitional care:

- CPC improved transitional care *after hospital stays.* In 2016, 60 percent of beneficiaries in CPC practices compared to 50 percent of beneficiaries in comparison practices reported that their provider's office contacted them within three days of their most recent hospital stay.
- CPC improved transitional care *after ED visits.* In 2016, 59 percent of beneficiaries in CPC practices compared to 51 percent of beneficiaries in comparison practices who visited the ED in the past year reported that their provider's office contacted them within one week of their visit.

These findings suggest that, while CPC practices were undergoing substantial changes to improve care delivery, CPC beneficiaries' experiences with care changed little during the initiative and their ratings were no different from those of comparison practice beneficiaries on most aspects of care delivery. The areas where we did see consistent findings—the increasing percentages of beneficiaries who reported that their provider followed up with them after hospital stays and ED visits—reflect CPC's emphasis on improved coordination of care across the medical neighborhood.

ES.7. CPC had favorable effects on Medicare FFS hospitalizations and ED visits but did not generate enough savings to cover Medicare's CPC payments (Chapter 8)

CPC's changes to primary care delivery were expected to lower Medicare FFS expenditures and service use and improve quality of care.

We estimated the impact of CPC on these outcomes using difference-in-differences regressions that compared mean beneficiary outcomes between CPC practices and a set of similar practices that were not participating in CPC. The analysis compared outcomes from the 12 months before CPC and the 51 months after CPC began, and controlled for beneficiary, practice, and market characteristics. It included 565,674 unique Medicare FFS beneficiaries attributed at any time during the initiative to 497 CPC practices and 1,165,284 beneficiaries attributed to 908 matched comparison practices.

Below are key findings:

CPC reduced the growth of hospitalizations, ED visits, and office-based primary care visits by 2 percent each for Medicare FFS beneficiaries.

Reductions in Medicare FFS expenditures were not sufficient to cover Medicare's care management fees.

There were minimal effects on the limited claims-based quality-of-care measures the evaluation tracked.

- **CPC had favorable effects on hospitalizations and ED visits.** Although Medicare service utilization grew during the initiative for both CPC and comparison practices, CPC practices experienced slower growth in hospitalizations, ED visits, and primary care visits than comparison practices. Hospitalizations increased by 2 percent less for CPC practices than for comparison practices over the initiative (or by 5 fewer hospitalizations per 1,000 beneficiaries per year,[12] $p = 0.07$) (Table ES.2). There was also 2 percent slower growth in ED visits for CPC practices than comparison practices during the initiative (or 10 fewer ED visits per 1,000 beneficiaries, $p = 0.03$). The effects on ED visits were more pronounced in the last two years of CPC.
- **The favorable effects on hospitalizations and ED visits are consistent with the findings from the implementation analysis.** For instance, practices noted that promoting high-risk patients' access to a care manager improved care and reduced hospitalizations through more attentive transitional care, medication reconciliation, and the identification of problems

---

[12] We treat the 51 months as four years, where the fourth "year" includes the final 15 months of CPC (October 2015 through December 2016). We express all results in terms of per month or per year of follow-up; therefore, the length of the period over which annualized expenditures and service use outcomes are measured does not affect their means. For outcomes that are not annualized—for example, the binary quality-of-care process measures for beneficiaries with diabetes and the continuity-of-care measures—we excluded the final three months of CPC.

between visits over the phone. Also, practices noted that improvements they made in other areas were likely reducing ED use. Changes included:

- Better identifying patients who frequently used the ED and targeting outreach to them.
- Better identifying high-risk patients.
- Encouraging patients to call the office before using the ED for nonurgent care.
- Improving access to the primary care practice.

Findings from the beneficiary survey suggest that more CPC practices provided timely follow-up care after hospitalizations and ED visits than comparison practices. Practice members thought that providing better follow-up care after hospital discharges and ED visits improved patient care.

- **CPC reduced primary care visits.** Office-based primary care visits grew by 2 percent less for CPC than comparison practices (or by 68 fewer visits per 1,000 beneficiaries per year, $p = 0.07$) (Table ES.2). This effect on office-based primary care visits might have been driven by greater reliance on non-visit-based interactions with patients among CPC practices, for example, by phone, or through follow-up by care managers, who cannot bill Medicare for such services.

- **CPC did not lead to statistically significant changes in total Medicare expenditures (excluding care management fees).** Over the course of the initiative, Medicare expenditures without care management fees increased by 1 percent (or $9 PBPM) less for the CPC practices than the comparison practices, but the difference was not statistically significant ($p = 0.16$, 90 percent confidence interval [CI] -$19, $2) (Table ES.2). Lower growth in inpatient expenditures, expenditures on skilled nursing facilities, and outpatient services drove the lower growth in total expenditures for the CPC group.

- **Although we would expect the effects on patient outcomes to increase over time as practices further implemented the CPC functions, year-by-year effects on Medicare expenditures without fees *declined* over time.** Estimated savings declined from $18 in Year 1, to $11 in Year 2, $4 in Year 3, and $2 in Year 4 (Figure ES.8).

Table ES.2. Percentage impacts on Medicare FFS expenditures and service utilization over the four years of CPC (all attributed beneficiaries)

Outcomes	Year 1	Year 2	Year 3	Year 4	Years 1–4 combined
Total Medicare expenditures ($ PBPM)					
Without CPC care management fees	**-2%*** **	-1%	0%	0%	-1%
With CPC care management fees	0%	1%	1%	1%	1%
Expenditures by type of service ($ PBPM)					
Inpatient	**-3%** **	-1%	0%	0%	-1%
Skilled nursing facility	**-7%*** **	**-6%** **	-3%	-3%	-5%
Outpatient	-1%	-2%	**-3%** **	**-3%* **	**-2%** **
Physician	0%	-1%	1%	*2%**	1%
Primary care physician	**-2%*** **	**-3%*** **	-1%	-1%	**-2%* **
Office-based primary care	**-2%* **	**-3%*** **	**-2%** **	-1%	**-2%** **
Specialist	0%	1%	2%	*3%***	*2%**
Office-based specialist	1%	0%	1%	*2%**	1%

Table ES.2 *(continued)*

Outcomes	Year 1	Year 2	Year 3	Year 4	Years 1–4 combined
Home health	**-3%****	2%	1%	-1%	-1%
Hospice	2%	1%	*10%**	7%	5%
DME	0%	-2%	-4%	**-4%***	-3%
Service utilization (annualized rate per 1,000 beneficiaries)					
Hospitalizations	**-2%***	-2%	-1%	-2%	**-2%***
Total ED visits	-1%	-1%	**-2%*****	**-2%*****	**-2%*****
Outpatient ED visits	-1%	-1%	**-3%*****	**-3%****	**-2%****
Observation stays	2%	*7%***	4%	*7%***	*5%***
Primary care visits	-1%	**-1%***	-1%	-1%	-1%
Office-based primary care visits	-1%	**-2%****	**-2%***	-1%	**-2%***
Specialist visits	0%	0%	1%	*2%****	1%
Office-based specialist visits	0%	0%	0%	2%	0%

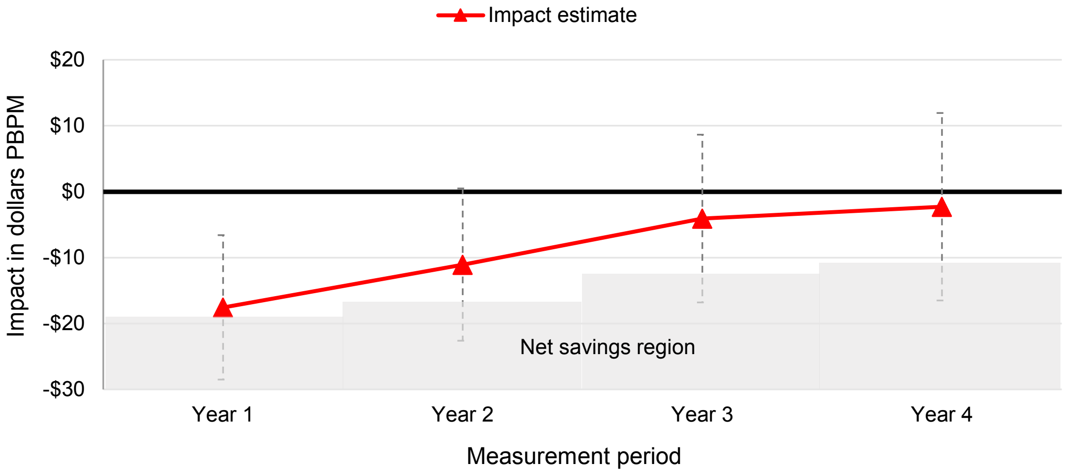
Source: Medicare claims data for October 2011 through December 2016.

Note: We base impact estimates on a difference-in-differences analysis; they reflect the difference in the regression-adjusted average outcomes for attributed Medicare FFS beneficiaries in CPC practices for a specific year compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in matched comparison practices. We calculate percentage impacts by dividing the impact estimate by the projected CPC group mean in the absence of CPC (that is, the unadjusted CPC group mean minus the CPC impact estimate). **Red shading** with *white italicized text* signifies that our estimate was statistically significant and showed an increase in the service use or expenditures outcome (note, however, that increases in expenditures or use of certain services such as primary care and hospice could be beneficial); **green shading** with **bold text** signifies that an estimate was statistically significant and implied a reduction in the service use or expenditures outcome. Expenditures on physician services include expenditures on primary care physician services, specialist services, and services provided by other noninstitutional providers (the third category is not shown separately). Measures of outpatient ED visits and total ED visits include observation stays. Primary care visits include both office-based primary care visits and primary care visits in other settings. Analysis includes 565,674 Medicare FFS beneficiaries attributed to 497 CPC practices and 1,165,284 beneficiaries attributed to 908 matched comparison practices. Each beneficiary can contribute as many as five observations in the analysis—one during the baseline year and one during each follow-up year.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

FFS = fee for service; DME = durable medical equipment; ED = emergency department; PBPM = per beneficiary per month.

Figure ES.8. Estimated impact of CPC on Medicare FFS expenditures without care management fees, by year



- **CPC did not generate enough savings to offset the care management fees for Medicare FFS beneficiaries.** Including CPC's Medicare FFS care management fees (which averaged $15 per beneficiary in our intent-to-treat [ITT] analysis), average monthly Medicare expenditures per beneficiary increased by 1 percent or $6 more for CPC than for comparison practices over the 51 months. This difference was not significantly different from zero (p = 0.35, 90 percent CI -$4, $16). Findings from a Bayesian analysis also showed a high probability (94 percent) of some gross savings but almost a zero probability that the savings were sufficient to cover the care management fee. Therefore, it is unlikely that CPC was cost neutral or generated net savings for Medicare.
- **CPC had minimal effects on quality-of-care process and outcome measures.** There were very few sizeable or statistically significant estimates for the quality-of-care process and outcome measures, or continuity of care. Among the limited claims-based measures available (five process measures for beneficiaries with diabetes, and for all beneficiaries, one transitional care measure, four continuity-of-care measures, and three outcome measures), cumulative estimates show a statistically significant effect on only one measure: the likelihood of an ED revisit within 30 days of an outpatient ED visit increased by 0.2 percentage points less, or about 3 percent of the mean rate (p = 0.02), for CPC relative to comparison practices. In annual estimates, the only statistically significant findings for quality-of-care process measures among beneficiaries with diabetes were in the high-risk subgroup.[13]
- **Within certain subgroups, CPC generated a favorable impact on Medicare expenditures without care management fees, but the evidence for differential impacts for different types of practices was weak.** We expected that CPC might have different impacts for practices with certain characteristics, so we tested for differential impacts on subgroups defined by those characteristics. We found that estimated effects on Medicare expenditures without fees were favorable and significantly different from zero (indicating gross savings) for practices that:

  1. Were recognized as medical homes at baseline
  2. Had six or more clinicians or were affiliated with a larger organization
  3. Were hospital or system-owned
  4. Were moderately large (3–5 clinicians)

  For example, the third finding indicates we found a favorable impact when we tested for differences among CPC and comparison practices that were owned by a hospital or system at baseline. In contrast, there were no statistically significant differences in Medicare expenditures between CPC and comparison practices among the subgroup that had at least one clinician who met requirements for meaningful use of EHRs, nor in its counterpart.

---

[13] This evaluation did not include the eCQMs that the model used for quality measurement and improvement for the entire practice population, and for calculating eligibility to share in any Medicare shared savings. Not all comparison practices report eCQMs, creating both conceptual and data challenges for analyzing the impacts of CPC on eCQMs.

The findings from these subgroup analyses suggest that practices with experience transforming care and greater access to resources may have achieved greater savings. However, there is only weak evidence for more favorable impacts within these practice subgroups because the impact estimates for any given subgroup were not significantly different from the estimates for its respective counterpart (that is, the opposite subgroup). For example, although there was a favorable $17 PBPM impact among practices that were owned by a hospital or system at baseline, that impact was not statistically different from the favorable $3 PBPM impact for practices that were not hospital- or system-owned at baseline. Applying any corrections for multiple comparisons or multiple hypothesis testing would make it even less likely that we would find statistically significant differences.

ES.8. CPC practices' self-reported measures of three key care delivery approaches had limited associations with lower Medicare service use and expenditures in the fourth program year (Chapter 9)

Knowledge about which care delivery approaches are most strongly associated with improvements in key outcomes such as expenditures, hospitalizations, and ED visits can help practices and CMS focus transformation efforts. We analyzed CPC practices to estimate how these outcomes for attributed Medicare FFS beneficiaries in Year 4 were associated with practices' self-ratings on their approaches to three aspects of care delivery that literature suggests are linked to better outcomes. We found few noteworthy associations:

- A stronger self-rating on timely primary care follow-up after a hospitalization or ED visit was associated with fewer hospitalizations, but not fewer ED visits or expenditures. Beneficiaries in practices at the 75th percentile on the follow-up measure had about 4 percent fewer hospitalizations on average than beneficiaries in practices at the 25th percentile on the follow-up measure. The associations were even larger among high-risk beneficiaries and in practices with high baseline hospitalization rates.
- Stronger self-rating on after-hours access to care was not associated with lower service use or expenditures.
- Stronger self-rating on continuity of care (patients seeing the same clinician at most of their office visits) was associated with fewer ED visits, but only for high-risk beneficiaries, and was not associated with fewer hospitalizations or lower expenditures.
- Contrary to expectations, these associations were not notably stronger among practices in which nonclinicians performed key clinical service roles.

Practices in the top quartile on self-rating of their follow-up with patients after a hospitalization or ED visit had 4 percent fewer hospitalizations in Year 4 than practices in the bottom quartile on follow-up. The association was even stronger for high-risk beneficiaries and for practices with high baseline hospitalizations.

Practices whose patients typically saw the same clinician during office visits had fewer ED visits, but only among higher-risk beneficiaries.

ES.9. Conclusion

Over the four-year initiative, CPC had mixed results on the outcomes examined in this evaluation. The initiative had considerable success in bringing together public and private partners to improve primary care and in implementing the key aspects of the CPC model among participating practices and the patients they serve. Yet while CPC improved practices' primary care approaches and showed significant improvements in some outcomes, the reductions in Medicare FFS utilization were not large enough to offset the care management fees that Medicare provided to practices. These evaluation results, and the lessons learned from the CPC experience, have informed CPC+, a new model of primary care transformation, and should help inform the work of other primary care initiatives.

1. INTRODUCTION

1.1. Overview of the Comprehensive Primary Care initiative

The Comprehensive Primary Care (CPC) initiative, a unique collaboration between the Center for Medicare & Medicaid Innovation (CMMI) of the Centers for Medicare & Medicaid Services (CMS) and 39 other private and public payers, aimed to improve primary care delivery and improve health care quality, patient and clinician experience of care, and lower costs. CMS selected CPC regions and payers—including commercial insurers and state Medicaid agencies and associated Medicaid managed care plans— in April 2012 and selected practices in August 2012 (see Figure 1.1. for the initiative's timeline). The four-year initiative began in fall 2012 and ended on December 31, 2016.

CPC tested a new model of care delivery in nearly 500 primary care practices across seven regions of the United States. It focused on helping practices implement five key functions in their delivery of care: (1) access and continuity, (2) planned chronic and preventive care, (3) risk-stratified care management, (4) patient and caregiver engagement, and (5) coordination of care among providers in the medical neighborhood who treat the same patients.[14] CMS specified a series of Milestones to help practices implement these functions, and it updated the requirements for each Milestone annually to build on practices' progress in the prior year (Table 1.1). CMS assessed how the practices were delivering care and required them to meet the Milestone requirements to remain in the program.

Table 1.1. CPC Milestones for program year (PY) 2016

1. **Budget.** Complete an annotated annual budget with PY2015 revenues/expenses and projected CPC initiative practice revenue flow for PY2016 at the start of the year and report actual revenue/expenses for PY2016 at the end of the year.
2. **Care management for high-risk patients.** Maintain at least 95 percent empanelment to provider and care teams. Continue to risk-stratify all patients, maintaining risk-stratification of at least 75 percent of empanelled patients. Expand care management activities for highest risk patients who are likely to benefit from longitudinal care management and those not otherwise at high risk but requiring episodic care management. Provide information about the care plans that are used for both longitudinal care management and episodic care management. Maintain the implementation of and further refine one of three strategies (behavioral health integration, medication management, or self-management support).
3. **Access by patients and enhanced access.** Enhance patients' ability to communicate 24 hours a day, 7 days a week with a care team that has real-time access to their electronic medical records. Continue to implement asynchronous forms of communication (for example, patient portal and email) and ensure timely responses. Measure continuity of care by measuring visit continuity quarterly for each provider and/or care team in the practice.
4. **Patient experience.** Assess patient experience through patient surveys or patient and family advisory council meetings and communicate to patients (using electronic, poster, pamphlet, or similar communication methods) about resulting changes the practice is making.

---

[14] For CMS's logic diagram for CPC, see http://innovation.cms.gov/Files/x/cpcidiagram.pdf or Appendix A, Figure A.1.

Table 1.1 *(continued)*

5. **Quality improvement.** Continue to perform continuous quality improvement using electronic health record (EHR)-based clinical quality measures (eCQMs) on at least three of the measures that practices report annually. Review at least one payer data feedback report (CMS Practice Feedback Report or other payers' reports) to identify a high-cost area and a practice strategy to reduce this cost while maintaining or improving quality.
6. **Care coordination across the medical neighborhood.** Track patients by implementing two of three options: follow up via telephone with patients within one week of emergency department (ED) visits; contact at least 75 percent of hospitalized patients within 72 hours of discharge; and enact care compacts with at least two groups of high-volume specialists.
7. **Shared decision making.** Use at least three decision aids to support shared decision making (SDM) for three preference-sensitive conditions and track patient eligibility for and use of the aids.
8. **Participating in learning collaborative.** Participate in regional and national learning offerings and communicate with regional learning faculty.
9. **Health information technology (IT).** Attest that each eligible professional in the practice is engaged with and working toward attestation for Stage II Meaningful Use in the timelines set by the Meaningful Use program.

Source: CPC PY2016 Implementation and Milestone Reporting Summary Guide.

To help participating practices change care delivery and accomplish the goals of CPC, the initiative provided them with financial support, data feedback, and learning support.

- **Financial support** from multiple payers who collectively represented a substantial market share in each region. CPC financial support to practices included *prospective payments* and the opportunity to receive *shared savings* retrospectively.
  - *Prospective payments.* For Medicare fee-for service (FFS) beneficiaries, CMS paid CPC practices an average of $20 per beneficiary per month (PBPM) in care management fees during CPC's first two years and $15 PBPM from January 2015 through the last two years of the initiative.[15] Care management fees from other payers varied, but for most

---

[15] CMS paid $20 PBPM in care management fees during Quarters 1 through 9 of CPC (through December 2014), and it paid $15 PBPM from January 2015 onward (for the last eight quarters of CPC). Therefore, over the 17 quarters of CPC, the average PBPM care management fee paid for patients still attributed to a practice was approximately $18. However, the average PBPM fee received in the intent-to-treat analysis sample used to estimate the effects of CPC was $15, because we retained all beneficiaries after they were first attributed, even if a practice did not receive fees for them because they were no longer attributed.

  business lines (such as Medicaid managed care and commercial), the average payments were much lower than those provided for Medicare FFS beneficiaries (for example, they ranged from about $2 to $15 for Medicaid managed care in 2016), which partly reflects the greater needs of Medicare FFS patients.

  - *Shared savings.* During the last three years of the program, Medicare FFS and about two-thirds of other payers offered participating practices the *opportunity* to receive a share of any net savings in health care costs beyond the amount required to cover the care management fees. Medicare FFS calculated savings at the regional level (that is, compared the total costs of Medicare attributed patients across all CPC practices in a region with expected expenditures for the performance year based on trending forward baseline costs; other payers that offered shared savings calculated it in a variety of ways (for example, at the regional, system, or even practice level, or among groups of unaffiliated practices).

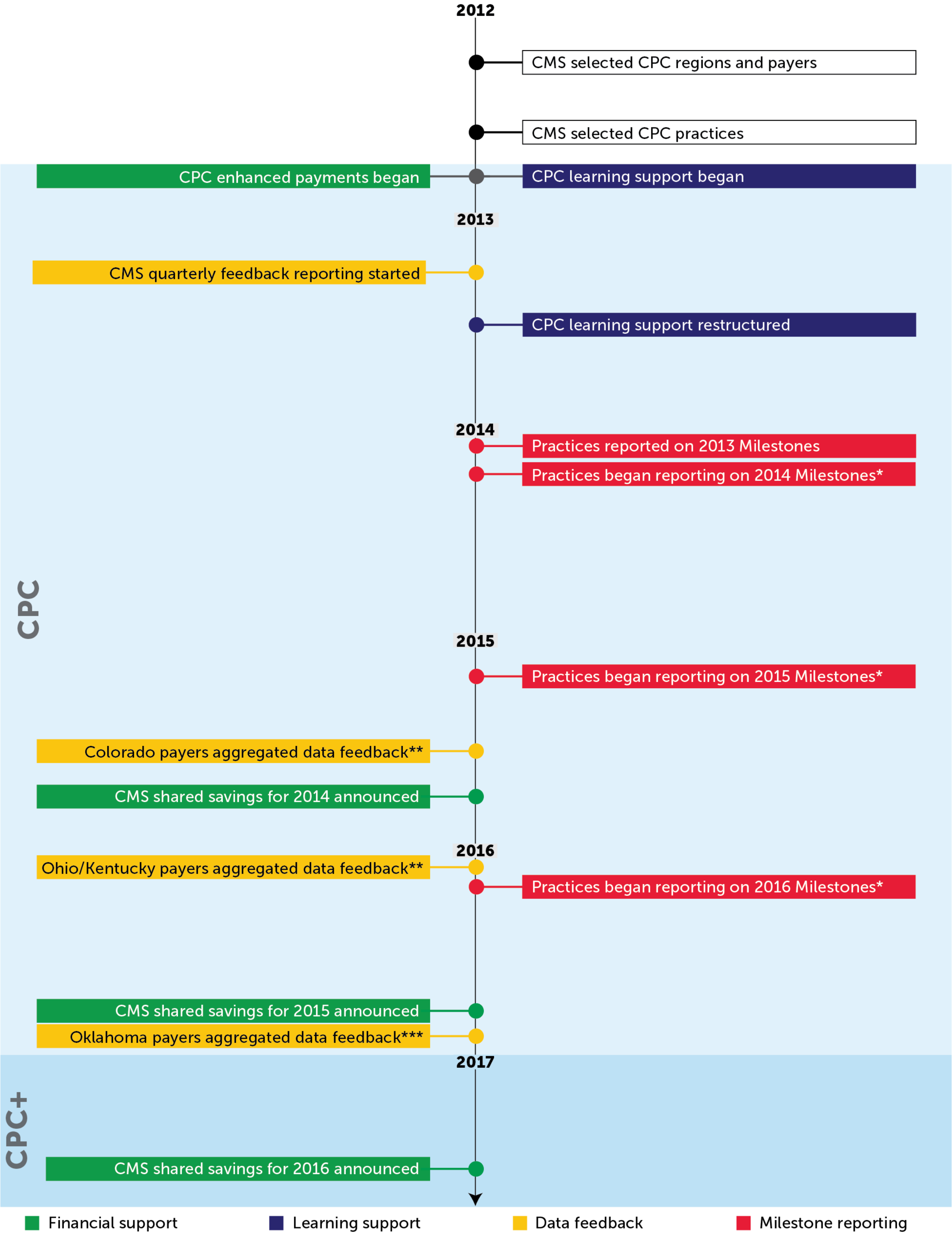
- **Data feedback** on each practice's progress in improving patient outcomes and controlling costs, provided quarterly by CMS for Medicare FFS beneficiaries and with varying frequency by most other participating payers for their participating patients. To increase reporting consistency and reduce clinician burden, over time, payers in five of the seven regions were able to align the measures included in their individual reports or provide practices with aggregated reports (in which a third party combines data from Medicare FFS and other payers into one report and provides that feedback to practices).
- **Learning support** to help practices understand CPC requirements, build quality improvement capacity, and make changes to provide comprehensive primary care. CMS and its learning contractors hosted group learning activities, which included opportunities for peer-to-peer learning and more didactic sessions, and in some cases they provided individualized support to practices.

In April 2016, CMS announced the largest multipayer primary care model ever tested to improve primary care, Comprehensive Primary Care Plus (CPC+), which builds on the lessons of CPC and other patient centered medical home models.[16] CPC+ launched on January 1, 2017, with 54 payers across 14 regions (including all 7 CPC regions, and 4 Multipayer Advanced Primary Care Practice [MAPCP] regions) supporting almost 2,900 practices that deliver primary care. Four more regions joined CPC+ in 2018 with an additional 7 payers and approximately 165 practices.

---

[16] For more information on CPC+, visit https://innovation.cms.gov/initiatives/comprehensive-primary-care-plus.

Figure 1.1. CPC implementation timeline



*Milestone reporting occurred quarterly, with final reports for each calendar year occurring in the first quarter of the subsequent year.
**Non-Medicare payers produced a single report or tool that aggregated patient-level claims data across payers. Full integration of CMS data was not completed until later in PY2016.
***Medicare and non-Medicare payers produced a single report or tool that aggregated patient-level claims data across payers in PY2016. In PY2015, payers in Oklahoma aggregated practice-level data.

1.2. Design of the CPC evaluation

Mathematica conducted a five-year, mixed-methods, rapid-cycle evaluation that provided CMS, practices, and regions with regular, formative feedback. The evaluation included implementation, impact, and synthesis studies and answered the following research questions:

- Which regions, payers, practices, and patients participated in CPC? Why? What characteristics distinguish them?
- What payment, data feedback, and learning support did CMS and the other payers provide? How did practices use these supports?
- How did practices change the way they delivered care, and what facilitated or impeded progress?
- What were the effects on clinician and staff experience; patient experience; and quality, service use, and costs for attributed Medicare FFS beneficiaries?
- How do the results differ across regions and across subgroups of practices and patients?
- What factors account for the varying degrees of success in achieving the goals of the initiative, or the speed with which participants reached these goals?
- What are the findings about—and implications for—replicating and spreading CPC?

The evaluation relied on a range of quantitative and qualitative data sources (Table 1.2). To study key areas of CPC implementation, we triangulated data to capture the perspectives of practices, patients, payers, CMS's CPC staff and contractors, and other stakeholders. To assess the initiative's effects on costs and quality for Medicare FFS patients and on practice, clinician, and patient experience, we compared outcomes for CPC practices with those of a set of comparison practices that were similar to CPC practices before the initiative began. For the synthesis of implementation and impact findings, we examined key links between specific changes in how practices deliver care and changes in key outcomes such as Medicare expenditures and hospitalization rates. The synthesis describes the successes and challenges of improving outcomes using CPC.

Table 1.2. CPC evaluation data sources

CMS and its contractors	
Interviews with CMS and its contractors	For each region, we interviewed CMS staff working directly with CPC payers and practices, CPC regional learning faculty ([RLF] organizations funded by CMS to support CPC practices), and multistakeholder faculty (organizations CMS contracted with to convene meetings of payers, practices, and other stakeholders). These annual interviews provided insight into the supports CMS and its contractors provided to CPC practices and barriers and facilitators to providing those supports.
Data on CMS payments for CPC	Data provided by CMS on CPC care management fees and shared savings payments made for Medicare FFS beneficiaries.
CPC learning contractor reports	These reports provided detailed information on the learning activities delivered by RLF and practice participation in those activities.
Observations of CPC activities	Observations of activities hosted by RLF and multistakeholder faculty provided insight into the learning activities offered to CPC practices and how payers and other stakeholders collaborated for CPC.

Table 1.2 *(continued)*

Other payers	
Payer memorandums of understanding (MOUs)	Information from CPC payer MOUs provided a baseline understanding of CPC payers' approaches to supporting practices.
Interviews with non-Medicare CPC payers	Interviews were conducted with non-Medicare payers annually to gain their perspectives on the initiative and understand the payments, data feedback, and learning they provided to CPC practices.
Practice-reported budget data	CPC practices' self-reported budget submissions to CMS provided insight into the magnitude of payments non-Medicare FFS payers made to CPC practices and how practices invested those payments.
Review of payer data feedback provided to practices	Reviewing practice-level feedback reports and patient-level data files provided by payers to CPC practices informed our understanding of the content and structure of those reports. (Mathematica produced Medicare FFS data feedback for CMS as part of the evaluation contract.)
CPC practices	
Practice application data	Information from practice applications provided a baseline understanding of CPC practice characteristics.
Practice tracking data	Monthly practice rosters from CMS and its contractors indicated changes in practice participation, including withdrawals, terminations, mergers, and closures.
Practice survey	A practice survey fielded to all CPC practices in October 2012 (baseline), and CPC and comparison practices in April 2014, 2015, and 2016. This survey included a modified Patient-Centered Medical Home Assessment (M-PCMH-A) tool, which Mathematica adapted for the CPC evaluation to capture approaches to care delivery in seven areas that are related to CPC Milestones. The survey also asked practices about their experiences with and perspectives on CPC. The analysis contains 471 CPC practices and 340-423 comparison practices, depending on the survey round. Appendix D describes the survey and analysis methods, and contains tables showing the results by survey round, for CPC and comparison practices, for CPC as a whole (across all seven regions).
Clinician and staff survey	Surveys fielded to a sample of primary care physicians, nurse practitioners, and physician assistants in CPC and comparison practices and various types of staff in CPC practices in September 2013 and June 2016. The surveys assessed clinician and staff experiences delivering primary care and experiences with CPC. The analysis reports on the responses of roughly 600 physicians,150 nurse practitioners and physician assistants (NPs/PAs), and about 2,000 staff—care managers or care coordinators, medical assistants, nurses, practice managers or supervisors, and receptionists or appointment clerks; and 500 physicians in comparison practices, in each round. Appendix E describes the survey and analysis methods, and contains tables showing the results by survey round, for respondents in CPC and comparison practices.
Interviews and observations of deep-dive practices	Qualitative data collected annually from 21 deep-dive practices selected for intensive study (3 practices per region). We conducted site visits to practices (in 2013 and 2015), and telephone interviews with practices in alternate years (2014 and 2016). Respondents included a practice clinician lead, other clinicians, CPC project coordinators, care managers, practice managers, Health IT staff and other staff. These data provide information on how practices implemented changes related to each Milestone, associated barriers and facilitators to this implementation, and experiences with CPC.
Interviews with exiting practices	Interviews with a sample of exiting practices provided perspectives on their reasons for withdrawal or termination and their future plans to improve primary care delivery.
Practice-reported Milestone data	CPC practices' self-reported data submitted to CMS on how they approached the CPC Milestones. In program year (PY) 2013, practices reported on Milestones once, at the end of the year. In subsequent years, practices were required to report on Milestones quarterly.

Table 1.2 *(continued)*

CPC patients	
Patient survey	A patient survey fielded annually beginning June 2013 through 2016 to samples of Medicare FFS beneficiaries attributed to CPC and comparison practices. The survey included questions from the Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CG-CAHPS) version 2.0, and CPC-specific questions that asked patients to rate their experiences with care from their primary care provider over the past 12 months. The analysis reports on the responses of more than 25,000 beneficiaries in roughly 500 CPC practices and 8,000 beneficiaries in roughly 800 comparison practices in each survey round. Appendix F describes the survey and analysis methods, and contains tables showing the results by survey round, for respondents in CPC and comparison practices.
Interviews with beneficiaries	Telephone interviews in 2015 with Medicare FFS beneficiaries that received care management services from CPC practices or served on CPC practices' patient and family advisory councils provided insight into beneficiaries' experiences with these aspects of CPC.
Claims and enrollment data	
Medicare FFS	Across all regions, Medicare FFS claims data were used to estimate the impact of CPC on costs, utilization, and quality of care for Medicare FFS beneficiaries.

1.3. This report

This final report to CMS covers the entire 51-month CPC implementation period (fall 2012 through December 2016). In Chapters 2 through 5 of this report, we discuss CPC's implementation in detail. In Chapter 2, we describe CPC participation and how it evolved over the course of the initiative. We describe the payment, data feedback and learning supports provided to CPC practices by CMS and other payers in Chapter 3 and how payers and other stakeholders worked together in Chapter 4. In Chapter 5, we detail how practices changed the way they deliver care. Our first three annual reports provide additional detail on CPC implementation during the first three years of the initiative (Taylor et al. 2015; Peikes et al. 2016a; Peikes et al. 2016b).

Chapters 6 through 8 report the impacts of CPC. Chapter 6 describes the impacts on clinician and staff experience. In Chapters 7 and 8, we report estimates of the impact on key outcomes for attributed Medicare FFS beneficiaries. Specifically, Chapter 7 reports effects on patient experience. Chapter 8 presents effects on a wide array of claims-based outcomes, including measures related to Medicare costs, utilization, quality of care, process of care, transitional care, and continuity of care. Finally, in Chapter 9, we examine the association between key aspects of care delivery and outcomes.

2. WHO PARTICIPATED IN CPC?

CPC was a bold undertaking that relied on a public-private partnership to support robust investment in primary care redesign, with the goals of improving quality, patient and clinician experience of care, and lowering costs. Selecting, organizing, and convening participants for an initiative of this scale and scope—and keeping them engaged and committed—required tremendous operational resources and capacity.

In this chapter, we highlight the characteristics of the initiative's participating regions, payers, practices, and patients and provide an overview of how participants were selected. (For additional information, see the first annual report; Taylor et al. 2015). We also describe how participation changed over time.

2.1. Key takeaways on CPC participation

- CMS implemented CPC in seven regions including four states (Arkansas, Colorado, New Jersey, and Oregon) and portions of three states (New York's Capital District-Hudson Valley region, Ohio and Kentucky's Cincinnati-Dayton region, and Oklahoma's Greater Tulsa region).
- Medicare FFS and 39 other payers, including five state Medicaid agencies, initially agreed to participate in CPC, committing substantial public and private resources to redesign primary care in CPC's seven regions (Figure 2.1; see Appendix B for additional details on participation).[17] This multipayer design was a key feature of CPC, and CMS considered it critical to creating an environment that supported comprehensive primary care for participating practices.
- Payer participation remained steady—only three small payers left CPC during the initiative. Moreover, 28 of the 36 payers that remained in CPC throughout the initiative also joined Comprehensive Primary Care Plus (CPC+), which CMS launched in January 2017 and builds on lessons learned from CPC.
- Participating payers included most of their lines of business in CPC. However, many of the 26 payers with self-insured clients initially struggled to enroll these clients in CPC. Through concerted efforts to engage self-insured clients, the number of payers reporting that all or nearly all of their self-insured clients participated in CPC doubled from 7 to 14 during the initiative.
- CMS selected 502 practices to participate in CPC. These practices were diverse; they included independent and system-owned practices, some practices that were recognized as medical homes and others that were not, and practices of different sizes. Practices were not selected based on care delivery approaches or outcomes. Most had substantial opportunities to improve care delivery at the start of CPC.
- Practice participation remained relatively stable throughout the initiative—only 1.8 percent of practices were terminated from the initiative (9 practices) and another 11.2 percent

---

[17] Payers that participated in more than one region are counted separately for each region in which they participated. Overall, 31 distinct payers participated in CPC in addition to Medicare.

voluntarily withdrew (56 practices). Among practices that withdrew, the most common reason was to join a Medicare accountable care organization (ACO) (29 of the 56 practices), given that CMS did not allow practices to participate in CPC and these ACOs. A number of practices also voluntarily withdrew after assessing the terms and conditions of CPC participation early in the initiative (5 practices) or due to challenges meeting CPC requirements (13 practices). Six practices closed during the initiative.[18]

- Practices that were terminated or withdrew from CPC were on average smaller than those that remained in CPC through the end of the initiative. Specifically, 78 percent of practices that left CPC had fewer than three physicians, compared with 56 percent of practices that remained for the duration of the initiative. Because care management fees were paid on a per-patient basis, practices that left CPC had received lower total care management fees during their participation than other practices; however, per-clinician payments to the two groups of practices were not statistically significantly different.
- Of the 422 practices that remained in CPC at the end of the initiative and were located in CPC+ regions, 98 percent (412 practices) also joined CPC+. In addition, 15 of the 57 practices that withdrew or were terminated from CPC for reasons other than their practice closing and were located in CPC+ regions joined CPC+.[19]
- CPC was designed to transform whole practices; as such, practices were expected to deliver the same care to all patients they saw. This population included patients of participating payers that were attributed to their practice (for whom practices received care management fees), patients of participating payers who were not attributed to the practice, patients of nonparticipating payers, and uninsured patients. The numbers of attributed and total patients were substantial, with attributed patients estimated at 1.1 million and total patients estimated at 3.1 million across all participating practices (based on practice-reported Milestone data).

---

[18] Several CPC practices also changed their composition during the initiative. Five CPC practices each split into two practices (adding five CPC practices to the total count). Three CPC practices merged with other CPC practices (subtracting three CPC practices from the total count).

[19] Three counties (Putnam, Rockland, and Westchester) that were included in the Capital District-Hudson Valley Region in New York for CPC were not included in the region for CPC+. Fifteen CPC practices that remained in CPC at the end of the initiative and two that withdrew from CPC were located in these counties and thus ineligible to apply for CPC+.

Figure 2.1. CPC regions, non-Medicare payers, practices, and patients

Changes in CPC participation

Payers
2012: **39**
2016: **36**

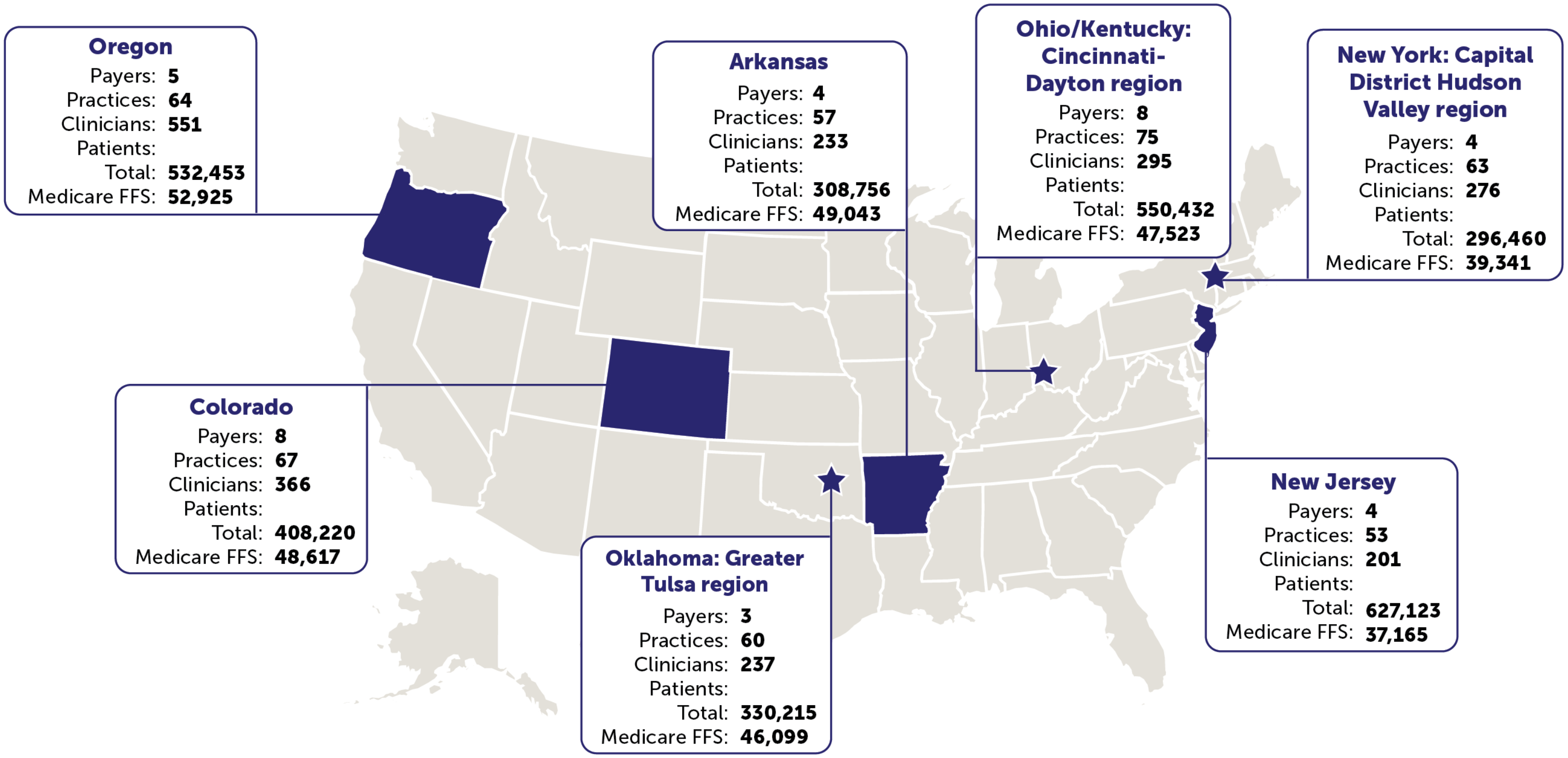
Practices
2012: **502**
2016: **439**

Clinicians
2012: **2,172**
2016: **2,159**

Patients

	Total	Medicare FFS
2013:	**2,544,272**	**326,100**
2016:	**3,053,659**	**320,713**

CPC participation as of December 2016



Oregon
Payers: **5**
Practices: **64**
Clinicians: **551**
Patients:
Total: **532,453**
Medicare FFS: **52,925**

Arkansas
Payers: **4**
Practices: **57**
Clinicians: **233**
Patients:
Total: **308,756**
Medicare FFS: **49,043**

Ohio/Kentucky: Cincinnati-Dayton region
Payers: **8**
Practices: **75**
Clinicians: **295**
Patients:
Total: **550,432**
Medicare FFS: **47,523**

New York: Capital District Hudson Valley region
Payers: **4**
Practices: **63**
Clinicians: **276**
Patients:
Total: **296,460**
Medicare FFS: **39,341**

Colorado
Payers: **8**
Practices: **67**
Clinicians: **366**
Patients:
Total: **408,220**
Medicare FFS: **48,617**

Oklahoma: Greater Tulsa region
Payers: **3**
Practices: **60**
Clinicians: **237**
Patients:
Total: **330,215**
Medicare FFS: **46,099**

New Jersey
Payers: **4**
Practices: **53**
Clinicians: **201**
Patients:
Total: **627,123**
Medicare FFS: **37,165**

Note: Number of payers above reflects non-Medicare payers. Medicare FFS also participated in all regions.

2.2. Methods

To understand payer participation, we reviewed the memorandums of understanding between CMS and other payers and analyzed data from qualitative interviews with CMS and other participating payers. To calculate the number of practices and patients that participated in CPC, we analyzed CMS's practice tracking data and practice-reported budget data. We drew on practice application data and the CPC practice survey to describe practice characteristics and interviews with participating and exiting practices and surveys with CPC clinicians and staff to understand practices' motivations for participating in CPC (see Table 1.2 for additional information on data sources used for the evaluation). We also compared the characteristics of the small proportion of practices that withdrew or were terminated from CPC to those that remained for the duration of the initiative.

2.3. Participating regions and payers

For CPC, Medicare FFS initially leveraged the support of 39 other payers across 7 regions. Payer participation remained steady—only three small payers left CPC during the initiative.

In September 2011, CMS invited payers nationwide to apply to participate in CPC. CMS scored payers' applications based on a variety of factors—most notably the payers' degree of alignment with CMS's approach to CPC, which included their commitment to provide participating practices with attribution reports, enhanced payments, and use and cost data to support their provision of comprehensive primary care, and their willingness to align with CMS and other payers on quality measures. CMS selected seven geographically diverse regions in which applying payers had a substantial combined market share and a preponderance of these payers received high scores on their individual applications. These seven regions included four states (Arkansas, Colorado, New Jersey, and Oregon) and portions of three states (New York's Capital District-Hudson Valley region, Ohio and Kentucky's Cincinnati-Dayton region, and Oklahoma's Greater Tulsa region).

After selecting the regions, CMS more closely reviewed applications of payers in the selected regions. CMS selected payers to participate in CPC that received high scores on their applications or were willing to refine their applications to increase alignment with the initiative by, for example, increasing the level of enhanced payments they provided to practices. Across all regions, CMS initially leveraged the support of 39 payers, ranging from 3 payers in the Oklahoma Greater Tulsa region to 9 payers in the Ohio/Kentucky Cincinnati-Dayton region. One national payer that was participating in two CPC regions joined in a third region during the first year of the initiative, which expanded payer participation. Participating payers included national and regional private payers, as well as public payers.

Most payers joined CPC because the initiative aligned with their organizational values and business strategy and provided an opportunity to build upon prior and concurrent efforts to improve primary care delivery (Taylor et al. 2015). Specifically, payers indicated that CPC's multipayer approach increased the impact of prior efforts in which enhanced payments and/or feedback reports covered only a small portion of any given practice's patients. In particular, payers suggested that collaborating with Medicare was important because Medicare covers a substantial portion of the typical primary care practice's patient panel and had been a crucial missing partner in prior efforts.

Over the course of CPC, payer participation remained notably stable in all seven regions, with 36 payers participating in CPC in its final year (Figure 2.1).[20] Only three payers (7.7 percent of all payers) across the seven regions withdrew from the initiative (two of which had fewer than 4,000 patients attributed to CPC practices; the third payer withdrew early and the number of attributed lives is unknown). None of the three payers withdrew because of dissatisfaction with CPC. Rather, two payers withdrew because their market share declined significantly and one because its self-insured clients would not contribute enhanced CPC payments. In addition to withdrawals, one participating payer acquired another participating payer (thus subtracting one payer from the total count). (See Chapter 4 for information on the factors that helped sustain multipayer collaboration.)

Further demonstrating payers' commitment to CPC, many payers in each of the seven CPC regions agreed to participate in CPC+ (CMS 2016). Specifically, 28 of the 36 payers that participated in CPC for the duration of the initiative also joined CPC+.[21]

Payers that participated in CPC operate different lines of business. For example, some payers that participated in CPC are Medicaid managed care plans and offer products only in that line of business; others operate several lines of business, such as commercial, Medicare Advantage, and self-insured. For CPC, payers varied in which lines of business they decided to include in the initiative. In the last year of the initiative, the most common lines of business included in CPC were commercial (26 payers) and Medicare Advantage (18 payers; Table 2.1.). Medicaid managed care lines of business (9 payers) were represented in all regions except Arkansas and Oklahoma (which did not have Medicaid managed care contracts). Additionally, Medicaid FFS participated in five regions. In four of these regions, Arkansas, Colorado, Ohio, and Oregon, CMS paid the CPC care management fees for Medicaid FFS beneficiaries. In Oklahoma, Medicaid collaborated in CPC and is counted as a participating payer, but it did not provide care management fees to participating practices.

---

[20] Payers that participated in more than one region are counted separately for each region in which they participated. In addition to Medicare, there were 28 distinct payers at the end of CPC.

[21] One CPC payer that joined CPC+ withdrew from the initiative in March 2017.

Table 2.1. Number of non-Medicare CPC payers in 2016, by lines of business included

	All regions	Arkansas	Colorado	New Jersey	New York: Capital District - Hudson Valley Region	Ohio/Kentucky: Cincinnati-Dayton Region	Oklahoma: Greater Tulsa Region	Oregon
Total payers (across lines of business)	36	4	8	4	4	8	3	5
Number of payers that included each line of business in CPC								
Commercial	26	2	7	3	4	5	2	3
Self-insured (Administrative services only or third-party administrator) [a]	20	2	5	2	2	5	2	2
Medicare Advantage	18	1	3	3	4	3	1	3
Medicaid Managed Care	9	0	1	2	1	2	0	3
Medicaid FFS	5	1	1	0	0	1	1	1

Source: Payers' pre-interview worksheets; payer interviews.

Notes: Medicare FFS also participated in each region. Four payers did not complete interviews in 2016. For these payers, we used the most recently available data on which lines of business they included in CPC.

[a] Payers that included any self-insured lives in CPC were included in these counts. Some of these payers included most or all of their self-insured lives in CPC whereas others included a small proportion.

FFS = fee-for-service.

In addition to fully insured business, 26 participating payers had self-insured clients (employers or other entities) in the CPC regions in 2016.[22] Most payers considered including self-insured lives in CPC important because the self-insured population represented a substantial proportion of their commercially insured business. (In fact, the self-insured population represents more than half of all commercially insured individuals in the United States (Stremkikis 2016). However, gaining self-insured clients' participation in CPC was difficult for payers because self-insured entities were reluctant to agree to pay enhanced CPC payments for their respective lives without evidence of a positive return on investment. Additionally, early in the initiative, self-insured clients lacked knowledge about CPC—or time to focus on it—given the resources required to respond to various Affordable Care Act requirements. These factors contributed to self-insured clients' initially low levels of participation in CPC.

Over the course of the initiative, most of these 26 CPC payers worked hard to increase and maintain participation in CPC by self-insured clients. As a result of their efforts, the number of payers reporting that at least some self-insured clients participated in CPC increased from 14 of 26 payers in 2013 to 20 in 2016 (Figure 2.2.).[23] Similarly, the number reporting that all or nearly

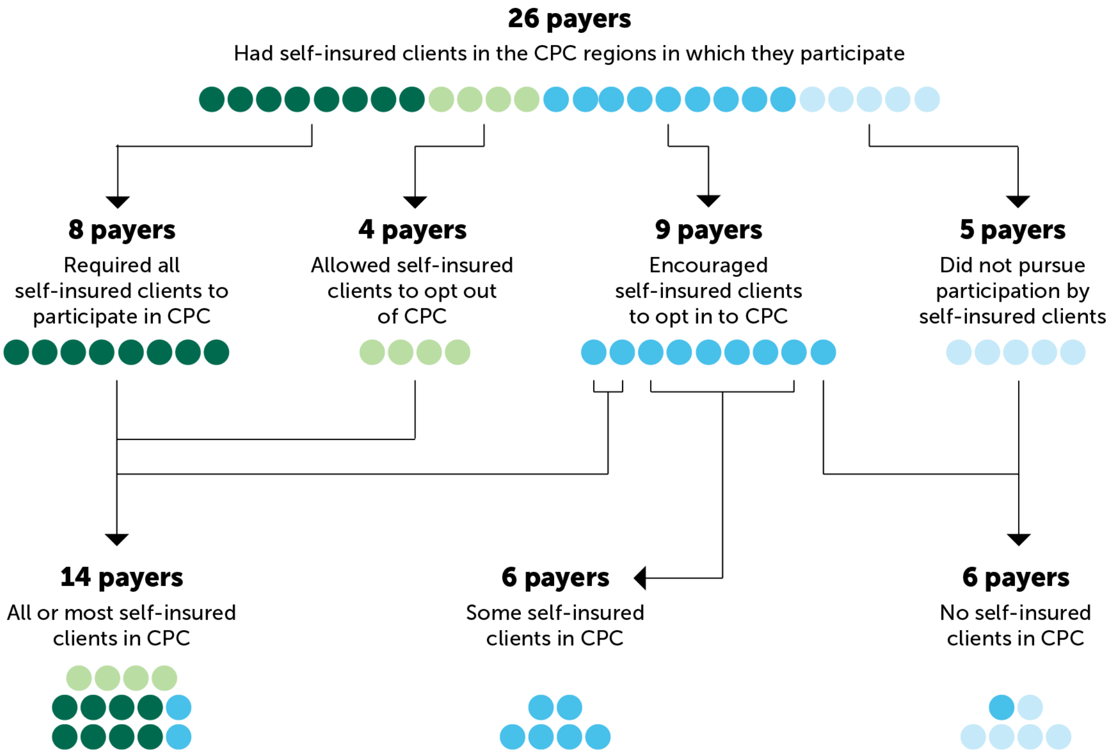
---

[22] In 2015, one payer added its first self-insured client in a CPC region. In 2016, a different payer lost its only self-insured client in a CPC region.

[23] Two payers with self-insured clients opted not to participate in interviews in 2016. We used their responses from 2015 interviews in this analysis. In 2015, one payer did not pursue self-insured clients; the other encouraged self-insured clients to join the initiative and had a small number of self-insured lives included.

all self-insured clients participated in CPC increased from 7 to 14 payers. Increases in self-insured participation were reported in most regions and by both regional and national payers.

Figure 2.2. Participation of self-insured clients in CPC in 2016



Source: Mathematica interviews with CPC payers.

Note: Two payers with self-insured clients opted not to participate in interviews in 2016. We used their responses from 2015 interviews in this analysis. In 2015, one payer did not pursue self-insured clients; the other encouraged self-insured clients to join the initiative and had a small number of self-insured lives included.

To increase participation of self-insured clients in CPC, some payers either required self-insured clients to participate or enrolled all self-insured clients unless they explicitly opted out. These payers enrolled all or most self-insured clients in CPC. Initially, payers that used these strategies tended to be larger, national payers that were concentrated in a few CPC markets. Other payers, concerned that requiring CPC participation might result in their losing self-insured clients, used an opt-in model, in which they invited self-insured clients to participate in CPC. Over the course of CPC, several payers shifted from an opt-in model to more proactive recruitment strategies as they and their clients became more comfortable with the initiative.

Payers indicated that demonstrating the potential benefits of CPC and how it might result in a positive return on investment for self-insured clients was critical to gaining and sustaining such clients' support for the initiative. Most payers that tried to encourage new self-insured clients to join CPC indicated it was a "hard sell" without evidence of the initiative's effectiveness. Similarly, payers that gained high levels of participation among self-insured clients indicated that clients continued to ask for outcomes data and might discontinue participation in future practice transformation efforts without such data. Employers indicated that they were most interested in seeing evidence of reductions in total cost of care or utilization, such as reduced hospitalizations or emergency department (ED) visits.

In the absence of data on CPC's effects, most payers educated employers on evidence supporting the patient-centered medical home model, which is similar to the CPC model, and the expected outcomes from CPC. In a few regions, payers used CPC multistakeholder meetings, which included payers and practice representatives, as a venue to engage self-insured clients and illustrate CPC's theory of change. For example, in the Ohio/Kentucky region, payers, practices, and participating self-insured clients formed an employer committee, which planned educational opportunities for employers that were not currently participating in the initiative. These opportunities included tours of CPC practices to show nonparticipating employers the types of changes CPC practices were making that could impact quality and cost of care for their employees.

As CPC progressed, payers that started to see improvements in cost and utilization outcomes noted self-insured clients' keen interest in these results. A few payers developed reports or tools to help them track the return on investment of CPC and other initiatives at the employer level. For example, one payer started providing large employers with data on ED use, hospital readmission rates, and costs for their employees overall and for those attributed to CPC practices.

2.4. Participating practices and patients

CMS selected 502 practices to participate in CPC. Practice participation remained relatively stable throughout the initiative—only 9 practices were terminated from the initiative and another 56 voluntarily withdrew. The 439 practices remaining in CPC reported that they had seen approximately 3.1 million patients in 2016.

After selecting the seven CPC regions and their participating payers in April 2012, CMS invited primary care practices from those regions to apply to participate in the initiative. From the roughly 1,000 that applied, CMS selected 502 practices to participate in CPC in August 2012. The number of practices selected per region ranged from 68 in the Oklahoma region to 75 each in the Ohio/Kentucky and New York Capital District-Hudson Valley regions (Appendix B). CMS selected practices that it felt had the best opportunity to transform and meet the goals of the CPC initiative based largely on their experience using health information technology, their experience with practice transformation or the patient-centered medical home model, and the proportion of their patients covered by participating payers, among other factors (Taylor et al. 2015).

Selected practices were diverse on many dimensions, including size, the extent to which they were independent, part of a medical group or owned by a larger health care organization, and whether they had medical home recognition. Seventeen percent of CPC practices were solo practitioners, whereas 27 percent had six or more clinicians. Eighteen percent were multispecialty practices, 55 percent were owned by a larger organization, and 39 percent had National Committee for Quality Assurance (NCQA) or state-certified medical home recognition.[24] For more information on practice characteristics at baseline, see Taylor et al. (2015).

To understand what motivated practices to participate in CPC, we used information from 21 "deep-dive" practices selected for in-depth examination.[25] Practice leaders from these deep-dive practices reported that they chose to apply for and participate in CPC because the initiative was broadly consistent with their own goals for practice improvement and with their aspirations for providing more patient-centered care (Taylor et al. 2015). Many practice leaders within deep-dive practices saw CPC as offering both financial and technical support for meeting their own goals. In addition, the multipayer collaborative nature of CPC offered practices the opportunity to operate in an environment where the goals and financial incentives of the payers covering their patients were relatively aligned.

Practice participation remained relatively stable throughout the initiative—1.8 percent of practices were terminated from the initiative and another 11.2 percent withdrew voluntarily (Figure 2.3).[26] Specifically, CMS terminated a total of nine practices for not complying with CPC terms and conditions (three practices each in New Jersey and Oklahoma, two in Arkansas, and one in New York). Among the 56 practices that voluntarily withdrew, only 13 withdrew because of challenges in meeting CPC requirements (Table 2.2). The most common reason for voluntary withdrawal was to join a Medicare ACO (29 practices). (Practices could not participate in both CPC and a Medicare ACO model. In contrast, for CPC+, CMS is allowing primary care practices to participate in both Medicaid Shared Savings Program [SSP] ACOs and CPC+.) Several practices also voluntarily withdrew after assessing the terms and conditions of CPC participation early in the initiative (five practices) and a few (three practices) withdrew for other reasons.[27] In addition, six practices closed during the initiative.

---

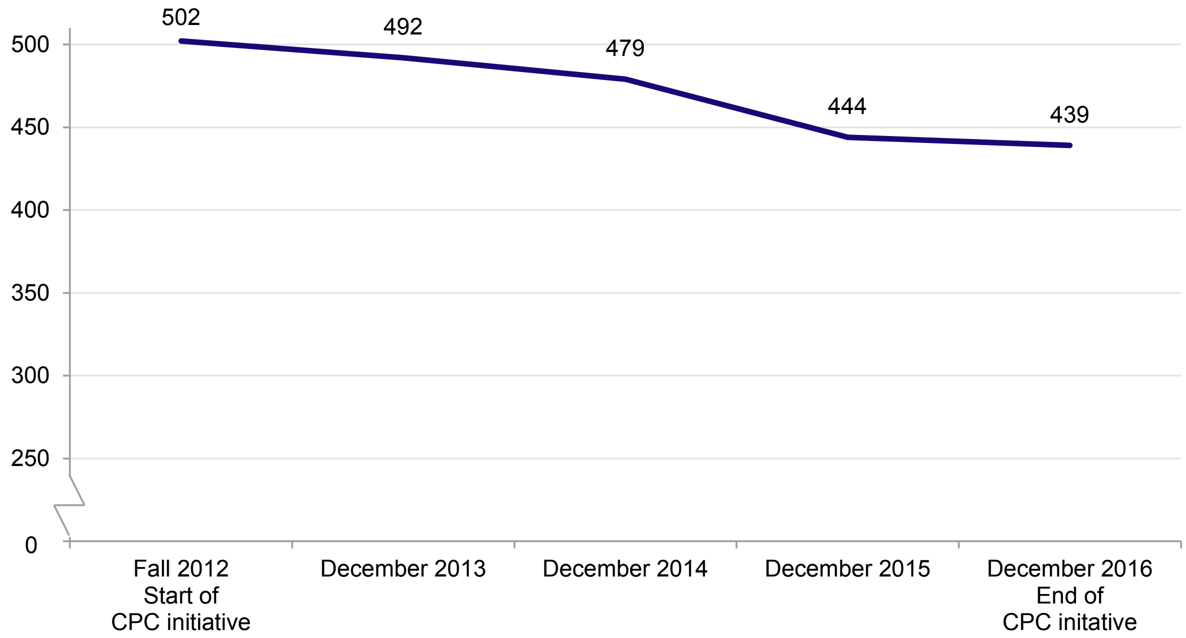
[24] Baseline practice characteristics were assessed for the 497 practices in the initiative as of March 2013. Five of the 502 practices selected withdrew early in the initiative, after assessing CPC's terms and conditions.

[25] For more information on selection and characteristics of deep-dive practices, as well as analysis methods, see Peikes et al. (2014), Taylor et al. (2015), and Keith et al. (2017).

[26] Several CPC practices also changed their composition during the initiative. Five CPC practices each split into two practices (adding five CPC practices to the total count). Three CPC practices merged with other CPC practices (subtracting three CPC practices from the total count).

[27] In addition, one practice withdrew after converting to a rural health clinic, which was ineligible to participate in CPC. One practice withdrew because participating in the initiative resulted in issues for its larger system's participation in the Value-Based Payment Modifier and Physician Quality Reporting System. One practice's reason for withdrawing is unknown.

Figure 2.3. Change in the number of CPC participating practices



Source: Mathematica analysis of CMS's implementation contractor's practice tracking database.

Note: Changes in the number of CPC participating practices reflect terminations, voluntarily withdrawals, and practice composition changes (that is, practice mergers and splits).

Table 2.2. Reasons that participating practices left CPC

	Total	PY2013	PY2014	PY2015	PY2016
Total number of practices that voluntarily withdrew or were terminated by CMS	**65**	**10**	**15**	**35**	**5**
Voluntary withdrawals					
Early withdrawals (after practices assessed the terms and conditions of CPC participation just after it started)	5	5	n.a.	n.a.	n.a.
Challenges completing CPC requirements	13	0	6	6	1
Decided to join a Medicare ACO	29	2	4	23	0
Practice closed/solo practitioner retired	6	3	1	1	1
Other reason or reason unknown[a]	3	0	0	1	2
Terminations by CMS	9	0	4	4	1
Practice remained in CPC but changed composition					
Practice split into two practices (adding a practice to total count)	5	0	3	2	0
Practice merged with another CPC practice (subtracting a practice from total count)	3	0	1	2	0
Net change in number of participating practices (accounting for withdrawals, terminations, and changes in practice composition)	-63	-10	-13	-35	-5

Source: Information from CMS, CMS contractors, and, when possible, Mathematica exit interviews with practices.

Table 2.2 *(continued)*

[a] One practice withdrew after converting to a rural health clinic in 2016, since such clinics were ineligible to participate in CPC. One practice joined a new health system in 2015 and withdrew from CPC because participating in the initiative resulted in unforeseen issues for its larger system's participation in the Value-Based Payment Modifier and Physician Quality Reporting System in 2016. To resolve the issue, CMS backdated the practice's withdrawal to December 31, 2015, and recouped the CPC Medicare FFS care management fees the practice received in 2016. This practice is counted as a 2015 withdrawal. One practice's reason for withdrawing in 2016 is unknown.

ACO = accountable care organization; PY = program year.

Of the 422 practices that remained in CPC at the end of the initiative and were located in CPC+ regions, 98 percent (412 practices) applied for and were selected to participate in CPC+. In addition, 15 of the 57 practices that withdrew or were terminated from CPC for reasons other than their practice closing and were located in CPC+ regions joined CPC+.[28]Ten of these 15 practices had withdrawn to join an ACO participating in SSP. Three were terminated by CMS for failing to comply with CPC terms and conditions.

Reflecting the high sustained practice participation rate, CPC physicians and staff had largely positive views about their experiences participating in CPC. For example, on the 2016 clinician survey, 80 percent of physicians reported that CPC had improved the quality of care or service provided to their patients, and if they could do it all over again, 79 percent would still support participation in CPC. Only 12 percent of physicians would oppose participation in CPC, and 9 percent reported not knowing enough about CPC to answer. Respondents were also asked about reasons to support and oppose participation. Many believed that CPC improved quality of care and cited improved patient care; the opportunity to contribute to primary care practice transformation; and the benefits of financial support, data feedback, and learning supports as reasons to support participation. Still, even supporters indicated that administrative reporting presented a burden and that transformation work in CPC was difficult. (See Section 6.3.5 for additional details on ratings of CPC among CPC practice members.)

2.4.1 Details on CPC practice withdrawals and terminations

More practices voluntarily withdrew during PY2015 than in other program years (31 of 56 practices). The uptick in practice withdrawals during this year was partly due to ACOs encouraging practices (or their systems) in some regions to join SSP, which would require these practices to drop out of CPC (because CPC did not allow practices to participate in both CPC and a Medicare ACO). These recruitment efforts were most intensive in the New Jersey region, which saw the largest number of voluntary withdrawals during the initiative (17 practices withdrew to join SSP ACOs or for other reasons). Following New Jersey, the highest numbers of withdrawals (for any reason) were from the New York (11 practices), Arkansas (10 practices), and Colorado (9 practices) regions.[29] In Oregon and Oklahoma, six and three practices withdrew, respectively. No practices withdrew or were terminated in the Ohio/Kentucky region during the

---

[28] Three counties (Putnam, Rockland, and Westchester) that were included in the Capital District–Hudson Valley region in New York for CPC were not included in the region for CPC+. Fifteen CPC practices that remained in CPC at the end of the initiative and two that withdrew from CPC were located in these counties and thus ineligible to apply for CPC+.

[29] Among the 56 practices that withdrew, 7 were part of the same New York health system, 6 were part of a New Jersey system, and 2 were part of a Colorado system.

initiative, and all CPC practices in Ohio/Kentucky applied and were selected for CPC+. Appendix B provides additional detail on regional changes in CPC participation.

Practices that were terminated or withdrew from CPC were statistically significantly more likely to be smaller than those that remained in CPC through the end of the initiative (Table 2.3). Specifically, 78 percent of practices that left CPC had one to three clinicians, compared with 56 percent of practices that remained for the duration of the initiative. A similar proportion of practices that left CPC were owned by a larger health care organization (42 percent) than those that remained (46 percent).

Due to their smaller size, practices that left CPC had received lower total care management fees (from all participating payers) than practices that remained; however, although PY2014 per-clinician payments were about $10,000 less in practices that left CPC, per-clinician payments to the two groups of practices were not statistically significantly different. Similarly, although a smaller proportion of practices that left CPC (67 percent) reported CPC payments were adequate than practices who remained (76 percent), this difference was not statistically significant. Additionally, compared with practices that remained in CPC, practices that left CPC were statistically significantly less likely to report on a survey of CPC practices that they had reviewed Medicare FFS feedback reports most or all of the time, that they communicated with their regional learning faculty (RLF) at least once a week (RLF provided group and individualized support to CPC practices), and that CPC significantly improved the practice's quality of care.[30]

Table 2.3. Comparison of practices that left CPC and practices that remained throughout CPC

	Practices that left CPC [a]	Practices that remained throughout CPC
Practice characteristics		
Number of participating clinicians per practice[b]		
Average (number)	3.28	4.51
Distribution (percentage)		***
One	38.3%	21.6%
Two to three	40.0%	34.2%
Four to five	8.3%	21.0%
Six or more	13.3%	23.2%

---

[30] The smaller than average size of practices that left CPC does not appear to be driving reported differences between practices that left and remained in CPC. To assess this finding, we conducted a subgroup analysis in which we compared the experiences of small practices (defined as those with three or fewer clinicians) that left CPC with small practices that remained (data not shown). Small practices that remained in CPC received similar median per practice and clinician payments as practices that withdrew. However, compared with small practices that left CPC, small practices that remained were more likely to report that CPC payments were adequate, that they frequently reviewed Medicare feedback reports and communicated with RLF, and that CPC significantly improved patient care.

Table 2.3 *(continued)*

	Practices that left CPC[a]	Practices that remained throughout CPC
Practice site is owned by a larger health care organization (percentage)[b,c]	41.7%	45.6%
Geographic location[d]		
Rural	12.5%	8.3%
Suburban	11.6%	10.7%
Urban	75.9%	80.4%
Practice had PCMH recognition at start of CPC (percentage)[b]	31.7%	40.8%
Practice modified PCMH-A score at the start of CPC (mean, out of 12)[b]	6.16	6.49
CPC supports		
Payment		
Practice indicates payments from Medicare FFS are adequate (percentage)[e]	67.4%	76.3%
CPC funding from Medicare FFS and other payers per practice in PY2013 (median)[f]	$139,269	$203,425***
CPC funding from Medicare FFS and other payers per clinician in PY2013 (median)[f]	$49,168	$59,125
Data feedback		
Practice reviews Medicare FFS feedback reports most or all of the time (percentage)[e]	65.2%	80.9%**
Practice reviews Medicare FFS feedback reports and views them as very useful (percentage)[e]	30.4%	31.9%
Learning support		
RLF communicated with practice at least once a week (percentage)[e]	15.2%	28.9%**
Practice rated RLF as excellent (percentage)[e]	41.3%	39.6%
Perception of CPC		
Practice reported that participation in CPC improved its quality of care a lot (percentage)[e]	34.8%	49.9%*

[a] Practices that withdrew early after assessing the terms and conditions of CPC participation just after it started are not included in this analysis.

[b] These items are based on practices' responses to the CPC practice application and practice surveys administered in 2013, 2014, 2015, and 2016. The analysis uses the most recently available data. n=60 for practices that left CPC; n=439 for practices that remained throughout CPC.

[c] Practices owned by a larger health care organization include practices where the clinicians are employed by, or the practice is owned by, a group or staff model health maintenance organization (HMO), hospital, hospital system, or medical school.

[d] This analysis used the Rural-Urban Continuum Codes from the USDA Economic Research Service (https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/documentation/) to classify practices as rural, suburban, or urban. n=56 for practices that left CPC; n=439 for practices that remained throughout CPC.

[e] These items are based on practice surveys administered in 2014, 2015, and 2016. The analysis uses the most recently available data. Nineteen practices that left CPC did not complete practice surveys administered during those years and were excluded. n=46 for practices that left CPC; n=439 for practices that remained throughout CPC.

Table 2.3 *(continued)*

[f] PY2013 CPC budget data submitted by practices to CMS. PY2013 budget data were not available for sixteen practices that left CPC. n=49 for practices that left CPC; n=439 for practices that remained throughout CPC.

*/**/*** Statistically significant at the 0.10/0.05/0.01 level.

FFS = fee-for-service; PCMH = patient-centered medical home; PY = program year; RLF = regional learning faculty.

We interviewed representatives from 27 of the 65 practices that withdrew or were terminated from CPC (11 withdrew to join ACOs, 11 withdrew due to challenges meeting CPC requirements, 4 were terminated by CMS, and 1 practice closed). Several of the practices that withdrew from CPC to join SSP ACOs belonged to large health care organizations that had only a subset of their primary care practices participating in CPC. These practices indicated that breaking away from their health system's standardized procedures to establish different workflows and documentation and reporting processes for CPC was challenging or inefficient. Moreover, several of these practices were surprised by the administrative burden required to report CPC Milestones and electronic clinical quality measures (eCQMs). These practices indicated that ACOs were more attractive than CPC, because ACOs had fewer administrative requirements, allowed all practices in their system to join the program, and rewarded practices for savings based on all providers in the system, instead of just providers at the CPC practice site; thus, practices perceived them as potentially more lucrative than CPC. Some practices that withdrew to join ACOs indicated that their work under CPC—such as risk stratifying their patients and hiring care managers—would help them succeed in the SSP ACO. In contrast, a few practices felt they had already met the CPC Milestones before the start of the initiative and indicated that ACOs would increase their flexibility to implement innovative changes (such as hiring a dental provider).

The practices we spoke with that withdrew due to challenges meeting CPC requirements or were terminated from CPC were typically small or solo physician practices. Most often, these practices reported difficulties fulfilling CPC Milestone requirements related to care management and the medical neighborhood. Several practices also were overwhelmed by CPC reporting requirements or were unable to generate needed reports from their EHRs. Exacerbating these challenges, many of these practices faced staffing issues, including difficulties finding staff with sufficient time to work on the initiative and problems hiring and retaining qualified care managers. Often, these practices reported that CPC care management fees were inadequate for them to successfully overcome these challenges. A few practices also indicated that more or higher-quality support from their RLF would have been helpful.

Participating patients. Participating practices reported that they had seen approximately 3.1 million patients in the program's final year (Table 2.4). These patients included 320,713 attributed Medicare FFS beneficiaries, 805,980 patients attributed by other participating payers, as well as 1.9 million nonattributed patients. (The number of attributed patients decreased over time due to changes in the number of participating practices. Several factors may have resulted in the increase in number of total patients served, including increased empanelment of patients to CPC practices or practices' errors in reporting.)

For all attributed patients, CPC practices received upfront payments in the form of care management fees, as we discuss in Chapter 3. CPC was designed to transform whole practices; as such, participating practices were required to implement changes across their entire practice regardless of patient attribution. This approach aimed to make implementing practice changes fit with the realities of clinical workflow, as staff do not need to distinguish between attributed and nonattributed patients. For PY2016, practices reported that a median of 37 percent of their active patients were attributed to them by Medicare FFS and other CPC payers, though the proportion attributed varied. Practices in the lowest quartile of attribution proportion reported that 29 percent or less of their active patients were attributed to them. Practices in the highest quartile reported 61 percent or more of their patients were attributed to them. (See Section 3.3.1 for additional information on how the proportion of attributed patients related to CPC funding levels.)

Table 2.4. Change in the number of CPC patients

	End of PY2013 (Dec 2013)	End of PY2014 (Dec 2014)	End of PY2015 (Dec 2015)	End of CPC initiative (Dec 2016)
Total patients served by CPC practices	**2,544,272**	**2,800,968**	**2,846,095**	**3,053,659**
Attributed Medicare FFS beneficiaries[a,c]	326,100	337,617	329,270	320,713
Attributed patients of other participating payers[b,c]	887,846	807,734	824,081	805,980
Other, nonattributed patients served by practices[b,c]	1,330,326	1,655,617	1,692,744	1,926,966

[a] CMS's implementation contractor provided lists of attributed Medicare beneficiaries each quarter; these lists were deduplicated so beneficiaries served in multiple quarters were only counted once in the number of patients ever attributed. This number differs somewhat from those that practices report.

[b] Practices reported the number of attributed and nonattributed patients in their budget and Milestone submissions at the end of each program year. Practices also submitted the total number of active patients in their practice at a point in time, which was used to calculate other, nonattributed patients served (by subtracting total attributed patients from total active patients). Mathematica analyzed the budget data for PY2013 and PY2016; Bland and Associates analyzed these data for PY2014 and PY2015. Given the potential for slight differences in the methods used to calculate these statistics, reported differences between years should be interpreted with caution.

[c] The number of attributed patients decreased over time due in part to changes in the number of participating practices. Several factors may have resulted in an increase in the number of total patients served, including increased empanelment of patients to CPC practices or practices' errors in reporting.

FFS = fee-for-service; PY = program year.

3. WHAT PAYMENTS, DATA FEEDBACK, AND LEARNING DID CMS AND OTHER PAYERS PROVIDE TO CPC PRACTICES?

For CPC, Medicare fee-for-service (FFS) initially leveraged the support of 39 other payers, and 36 of those payers remained in the initiative for the duration of CPC. Through CPC's unique public–private partnership, CMS and participating payers provided CPC practices with payments, data feedback, and learning supports to facilitate practice transformation. The intensity of these supports varied by region and practice; as a whole, however, they represented a substantial intervention. In this chapter, we draw on a range of data sources to describe the supports that CMS and other payers provided to practices and how those supports changed over the course of the initiative as well as highlight practice perspectives on the usefulness of the supports they received. The first section of this chapter provides an overview of our findings. The second section highlights the data sources used in this chapter. Then, in the sections that follow, we provide additional detail on payments, data feedback, and learning supports.

3.1. Key takeaways on CPC supports to practices

CMS and other participating payers provided significant support to CPC practices and, in general, practices found that these supports helped them accomplish the work required for CPC. Medicare FFS and other payers provided substantial financial support for participating practices, with practices reporting that CPC payments accounted for between 10 and 20 percent of practice revenue, depending on the program year. In addition, CMS and most other payers provided data feedback to practices; depending on the payer, this feedback included a combination of cost, utilization, and/or quality data reported at the practice level, patient level, or both. In five regions, payers aligned or aggregated claims data across payers in the region. Many practices considered CPC's data feedback useful, but some found it challenging to incorporate into their improvement efforts. Many practices also considered CPC learning supports, which included group learning activities and, for a subset of practices, individualized coaching, important for achieving the aims of CPC.

3.1.1. Payments to CPC practices

- Medicare FFS and almost all other payers that remained throughout the initiative provided prospective, monthly, non-visit-based care management fees to CPC practices in addition to usual payments for services to support enhanced, coordinated care. To support upfront investments in practice transformation, Medicare and 30 percent of payers paid higher care management fees in the first two years of the initiative. CMS care management fees for Medicare FFS attributed beneficiaries averaged $20 per beneficiary per month (PBPM) for the first two years of CPC and $15 PBPM for the last two years. Care management fee rates for other payers varied considerably, but most had care management fees that were lower than Medicare FFS amounts.
- According to Medicare FFS payment data and practice-reported data on payments received from other payers:
    - Care management fees to practices from Medicare FFS and other payers totaled $479.1 million over the four-year initiative.

  - Reflecting the decrease in care management fees beginning in PY2015, median care management fees per practice were higher in PY2013 ($227,849) and PY2014 ($203,949) than in PY2015 ($175,774) and PY2016 ($179,519).[31] Dividing the total payment to a given practice by the number of clinicians in the practice revealed that median per-clinician payments also decreased from $70,045 in PY2013 to $50,189 in PY2016. Depending on the year, these payments accounted for between 10 and 20 percent of practice revenue.

- Medicare and about two-thirds of other participating payers also gave practices the opportunity to share in any savings accrued during the last three years of the initiative (PY2014, PY2015, PY2016).
  - For PY2014 performance, Medicare FFS found that CPC generated savings in one region—Oklahoma. Medicare FFS shared savings payments totaled $658,129. Across all regions, 10 of the 20 non-Medicare FFS payers reporting results of their shared savings calculations for PY2014 found that CPC generated savings.
  - For PY2015 performance, Medicare FFS found that CPC generated savings in four regions—Arkansas, Colorado, Oklahoma, and Oregon. Medicare FFS shared savings payments totaled more than $13 million. Across all regions, 10 of the 15 non-Medicare FFS payers reporting results of their shared savings calculations for PY2015 found CPC generated savings.
  - For PY2016, Medicare FFS found that CPC generated savings in two regions—Arkansas and Oklahoma. Medicare FFS shared savings payments to practices in these regions totaled more than $10 million. Non-Medicare payers did not report results for this performance year in time for inclusion in this report.
- Despite the reduction in care management fees starting in 2015, more than three-quarters of practices reported on the CPC practice surveys in 2014, 2015, and 2016 that CPC payments were adequate or more than adequate relative to the costs of implementing CPC.

3.1.2. Data feedback provided to CPC practices

- In PY2015 and PY2016, CMS and 32 of the 36 non-CMS payers provided claims data feedback to practices.
- Payers in five regions developed a common approach to data feedback. Payers in:
  - Arkansas and Oregon took steps to align the cost and service use measures included in individual payer feedback reports with each other and Medicare FFS.
  - Colorado, Ohio/Kentucky, and Oklahoma achieved data aggregation; each region created a single report or tool to aggregate data across payers each quarter (non-Medicare FFS payers aggregated data first and then Medicare FFS joined those efforts).
- During interviews, some deep-dive practices reported using CPC data feedback to identify goals for their quality improvement work or to improve identification of high-risk patients.

---

[31] Payments in PY2013 were higher than in PY2014, because PY2013 included several months of CMS payments in late 2012.

- Through interviews with deep-dive practices and CMS contractors and surveys of CPC practices and clinicians, we identified several challenges practices faced using data feedback. Some practices:
    - Owned by a health system reported that only staff at the health-system level reviewed feedback reports (instead of physicians at the practice level)
    - Viewed data feedback as complex and difficult to understand
    - Lacked the time or skills to use data feedback effectively
    - Viewed factors driving high costs as out of their control
- Findings from the evaluation suggest that CMS and other payers may improve their approaches to providing data feedback for future initiatives by:
    - Seeking additional input from practices on strategies for improving the format and structure of data feedback and implementing suggestions when possible
    - Providing more training on how to use these data to guide quality improvement
    - Encouraging more practice members to review such data

3.1.3. Learning supports provided to CPC practices

- CMS contracted with TMF Health Quality Institute (TMF) to provide learning supports to CPC practices. TMF and its subcontractors were referred to as regional learning faculty (RLF).
- CMS and RLF provided practices with a variety of group learning activities, including webinars and all-day, in-person meetings. CMS and its contractors adapted learning activities over time to encourage additional peer-to-peer learning, emphasize the use of data for practice improvement, and engage practices in implementing small tests of change.
- RLF also had limited resources to provide a subset of practices with individualized coaching. RLF selected practices to receive this coaching and adjusted its intensity depending on practices' progress toward CPC Milestones and their performance on quarterly Medicare feedback reports. On the 2016 CPC practice survey, 56 percent of practices reported receiving in-person coaching.
- According to the 2016 CPC practice survey, non-Medicare payers also provided coaching or assistance to 71 percent of practices in the six months before the survey. The percentage that reported receiving this assistance varied considerably by region, from 52 percent of practices in Oregon to 96 percent in Ohio/Kentucky.
- Analysis of the CPC clinician and staff surveys indicated that, among members of CPC practices, care managers were most likely to report having participated in CPC learning activities, followed by physicians, and then by medical assistants and nurses.
- Practices found in-person learning activities and opportunities for peer-to-peer learning to be the most valuable form of learning support, according to the practice survey and interviews with deep-dive practices.
- Although practices valued learning, deep-dive practices also indicated that finding time to participate in learning activities was challenging and some activities (in particular, webinars)

were repetitive or not tailored to meet different practice needs. Practices also indicated that the lack of electronic health record (EHR) vendor participation in learning activities limited practices' ability to resolve EHR-related issues.

3.2. Methods

This chapter draws on a range of data sources. Interviews with CMS, its contractors, and other payers gave us insight into the supports provided to CPC practices. We also used CMS data on CPC payments and practice-reported budget data to study the magnitude of CPC payments. In addition, we reviewed CPC data feedback from Medicare and other payers, observed learning activities, and analyzed data on CPC learning support provided by CMS's learning contractor (TMF Health Quality Institute). To understand practices' use of and perspectives on CPC supports, we drew on interviews with deep-dive practices selected for intensive study and surveys with practices, clinicians, and staff. (See Table 1.2 for additional information on the data sources used for the evaluation.)[32]

Although we explore practice and other stakeholder perceptions on the value and benefits of payments, data feedback, and learning, our evaluation could not disentangle the effect of any particular support (such as the availability of aggregated data feedback across payers) on practice transformation from the impact of other practice supports—given that supports were provided to participating practices as a package.

3.3. Payments to CPC practices

CMS and other payers made substantial payments to CPC practices to support primary care transformation, *in addition to their usual payments for services*. These payments were in the form of non-visit-based care management fees for patients attributed to CPC practices.[33] (Medicare FFS uses the term per beneficiary per month [PBPM] to refer to these payments; other payers use per member per month [PMPM].) Practices received these payments throughout the four-year initiative to allow them to "invest in the infrastructure, staffing, education, and training necessary for delivery of the five comprehensive primary care functions."[34] Practices were also provided the opportunity to share in any savings in total health care costs incurred by Medicare and around two-thirds of other payers in the second, third, and fourth years of the initiative. Practices were expected to transform care for all patients seen at their practice, regardless of whether they received payment for them through the initiative.

In this section, we first describe the care management fees CPC practices received from CMS and other payers. We report the median payments per practice and clinician, highlighting how median payments changed over time and varied across regions. Next, we describe payers' approaches to calculating shared savings and report the results of those calculations. Finally, we

---

[32] Practice surveys fielded in 2014, 2015, and 2016 asked practices for their perspectives on CPC supports. The baseline survey, fielded in 2012, did not ask about CPC supports.

[33] Medicare FFS beneficiaries were attributed quarterly to CPC practices that delivered the largest share of their primary care visits during a two-year look-back period; other payers used their own attribution approaches.

[34] This language was included in memoranda of understanding between CMS and each CPC participating payer.

describe practices' perceived adequacy of CPC payments and highlight how practices used those payments to support CPC work.

3.3.1. Care management fees from CMS and other payers

CPC provided participating practices with substantial funding. For each year of the initiative, practices reported receiving a median of more than $175,000 per practice ($50,000 per clinician) in care management fees from Medicare FFS and other payers

a. Care management fee structure and level

CMS paid risk-based care management fees for each Medicare beneficiary attributed to a CPC practice, in addition to FFS payments for regular services and CPC care management fees for Medicaid FFS beneficiaries in the four regions in which Medicaid participated. To support upfront investments in practice transformation, Medicare paid higher care management fees in the first two years of the initiative. For CPC's first two years, CMS care management fees for Medicare FFS averaged $20 PBPM (with fee levels of $8, $11, $21, and $40, depending on the beneficiary's risk score). Starting in January 2015, CMS reduced the average payment to $15 PBPM (with fee levels of $6, $8, $16, and $30, depending on risk score).[35]

All but two of the 36 non-Medicare FFS payers also used PMPM payments for their enhanced CPC payments to practices; rates varied considerably by line of business (Table 3.1).[36] Most of these payers (including Medicare Advantage plans, Medicaid managed care, commercial insurers, and, in some regions, CMS on behalf of Medicaid FFS agencies) paid lower PMPM amounts on average, in part reflecting the lower average acuity level for their patients. Unlike Medicare FFS, 70 percent of payers did *not* reduce their PMPM payments over the course of the initiative. Moreover, two regional payers increased their PMPM amounts in an effort to promote high-quality primary care. The 30 percent of payers that decreased their PMPM payments made reductions ranging from 19 to 40 percent of their prior year's payment, similar to Medicare's 25 percent reduction. Most of these reductions took place in PY2015.

---

[35] Risk was measured using the patient's Hierarchical Condition Category (HCC) score (a measure of risk for subsequent expenditures calculated annually by CMS for each beneficiary attributed to a CPC practice; see Pope et al. 2004). By design, half of the Medicare FFS funding in each region was for attributed beneficiaries in the highest HCC risk quartile.

[36] One payer provided capitated payments instead of PMPM payments. One payer did not contribute enhanced payments to practices.

Table 3.1. Range of CPC participating payers' PMPM payments for PY2016

Payer type	PMPM range	Median PMPM
Medicare FFS	Average PBPM was $15 ($6/$8/$16/$30 depending on HCC risk score)	Average PBPM was $15 ($6/$8/$16/$30 depending on HCC risk score)
Medicare Advantage	$4.00–$20.00	$10.00
Commercial, third-party administrator, administrative services only	$2.00–$9.00	$4.00
Medicaid managed care	$2–$11.56	$5.93
Medicaid FFS	$4–$10	$4.95

Source: CPC payer worksheets and Mathematica interviews with CPC payers in June through October 2016.

Note: In PY2016, approximately 40 percent of non-CMS payers risk-adjusted their CPC PMPM payments to practices. If payers provided a PMPM range or PMPM tiers for a line of business, those numbers were averaged. Payers operating in more than one region are counted multiple times, once for each region in which they participate. This analysis includes 32 payers. Four CPC payers are excluded from this table: one is not providing practices enhanced payments, one is using a capitation model, and two did not report their PMPM levels.

FFS = fee-for-service; HCC = Hierarchical Condition Category; PBPM = per beneficiary per month; PMPM = per member per month.

b. Median care management fees paid to practices

For each year of the initiative, practices reported receiving a median of more than $175,000 per practice ($50,000 per clinician) in care management fees from Medicare FFS and other payers (Figure 3.1 and Figure 3.2). Over the course of the initiative, these care management fees totaled $479.1 million. Although Medicare FFS beneficiaries accounted for only 28 percent of patients attributed to CPC practices, Medicare FFS care management fees made up 58 percent of total CPC care management fees to practices. (See Appendix C for total CPC payments from Medicare and other payers by program year.)

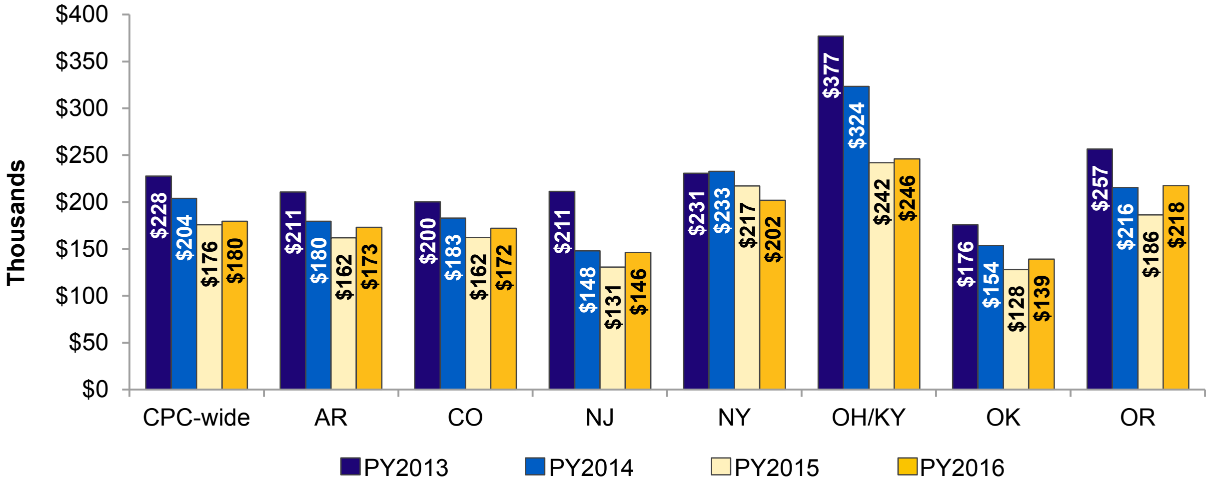
Median payments to CPC practices varied by year as a result of changes in payers' PMPM rates as well as changes in the number of lives payers attributed to CPC practices. Most notably, reflecting the decrease in care management fees over time by Medicare and 30 percent of other payers, the median payments to practices were higher in PY2013 ($227,849) and PY2014 ($203,949) than in PY2015 ($175,774) and PY2016 ($179,519). (Payments in PY2013 were higher than in PY2014 because PY2013 included several months of CMS payments in late 2012.[37])

However, even following the decrease in care management fees to practices, CPC provided a substantial infusion of revenue for practices. CPC care management fees in PY2016 averaged 10.5 percent of 2016 total practice revenue for CPC practices. In PY2016, this funding translated to a median of $95.41 per *attributed* patient (that is, for patients attributed to practices by CPC payers) or about $7.95 PMPM, or $42.57 per active patient (that is, patients attributed by CPC payers *and* nonattributed patients) or $3.55 PMPM.

---

[37] CMS defines CPC's first program year (PY2013) as October 2012 through December 2013. CMS began making CPC care management payments in October 2012 for the Arkansas and Oklahoma regions, and in November 2012 for all other regions. Other participating payers began making such payments on or before February 1, 2013.

Figure 3.1. Median CPC funding per practice, CPC-wide and by region

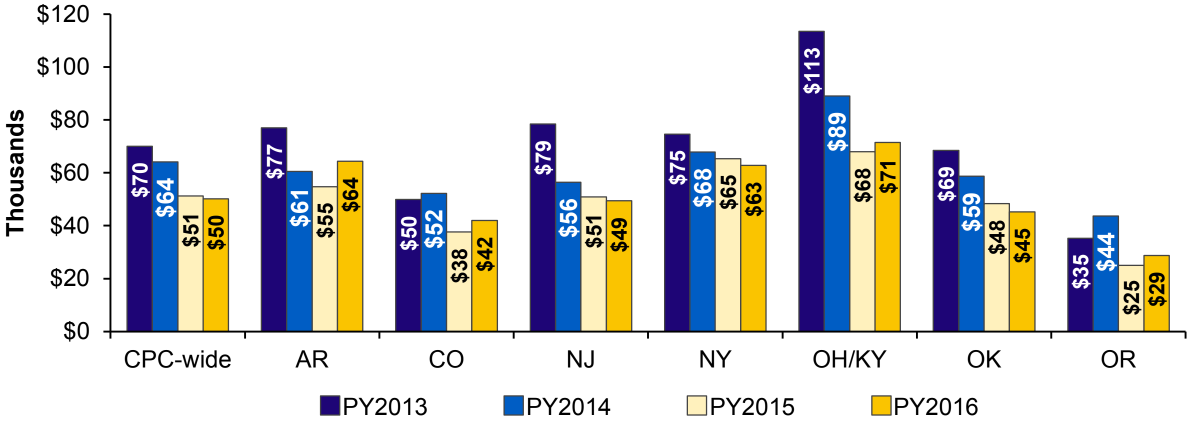


Source: Practice-reported budget data analyzed by Mathematica for PY2013 and PY2016 and CMS's monitoring and compliance contractor for PY2014 and PY2015.

Note: This analysis is based on practice-reported data. Reported differences between years should be interpreted with caution, given slight differences in the methods underlying the calculation of these statistics. Medicare FFS payments in PY2013 were higher than in PY2014 and PY2015, because PY2013 included several months of CMS payments in late 2012. CMS defines CPC's first program year (PY2013) as October 2012 through December 2013. CMS began making CPC care management payments in October 2012 for the Arkansas and Oklahoma regions, and in November 2012 for all other regions. Other participating payers began making such payments on or before February 1, 2013.

FFS = fee-for-service.

Figure 3.2. Median CPC funding per clinician, CPC-wide and by region



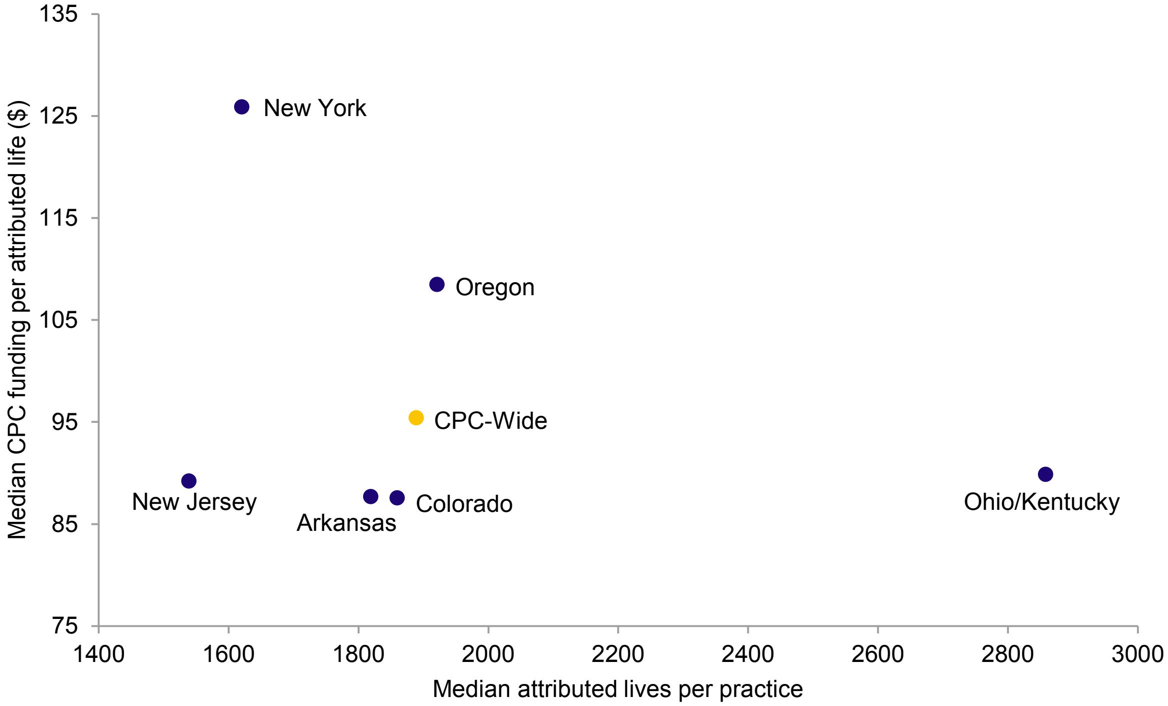
Source: Practice-reported budget data analyzed by Mathematica for PY2013 and PY2016 and CMS's monitoring and compliance contractor for PY2014 and PY2015.

Note: This analysis is based on practice-reported data. Reported differences between years should be interpreted with caution, given slight differences in the methods underlying the calculation of these statistics. Medicare FFS payments in PY2013 were higher than in PY2014 and PY2015, because PY2013 included several months of CMS payments in late 2012. CMS defines CPC's first program year (PY2013) as October 2012 through December 2013. CMS began making CPC care management payments in October 2012 for the Arkansas and Oklahoma regions, and in November 2012 for all other regions. Other participating payers began making such payments on or before February 1, 2013.

FFS = fee-for-service.

Median CPC payments per practice also varied across regions. In 2016, the median CPC payments per practice ranged from $139,134 in Oklahoma to $246,016 in the Ohio/Kentucky region (Figure 3.1). The median payment per clinician ranged from $28,752 in Oregon to $71,499 in the Ohio/Kentucky region in 2016 (Figure 3.2). The total payment to a given practice reflects the amount of funding payers provided for each attributed patient and the number of patients that payers attributed to their practice. Payer attribution was highest in regions in which a large proportion of payers participated in CPC for both their fully-insured and, if relevant, self-insured lines of business. (Although Medicare FFS paid the same care management fees across regions, other payers' care management fee amounts varied.) Regional differences in payers' payment levels and median numbers of attributed lives per practices contributed to regional variation in median payments. For example, practices in Ohio/Kentucky reported a median of more than 2,800 attributed patients, much higher than medians in other regions. Although payers in Ohio/Kentucky paid similar care management fees as payers in New Jersey, Arkansas, and Colorado, the high number of attributed lives resulted in Ohio practices reporting the highest total payments. The regions with the second and third highest median CPC funding per practice—Oregon and New York, respectively—reported a similar median number of attributed lives as practices in other regions but a higher median CPC payment level per attributed life.

Figure 3.3. Median attributed patients per practice and median CPC funding per attributed life, CPC-wide and by region (excluding Oklahoma*)



Source: Practice-reported budget data analyzed by Mathematica for PY2013 and PY2016 and CMS's monitoring and compliance contractor for PY2014 and PY2015.

Note: *Oklahoma was excluded from this figure because it had only two non-Medicare payers in CPC+ and reporting the average amount paid would have divulged payment amounts to each payer.

3.3.2. Shared savings payments from CMS and other payers

Medicare FFS found CPC generated savings in one region for PY2014 performance and four regions for PY2015 performance. Other payers also found CPC generated shared savings: 10 out of 20 payers reporting their results for PY2014 and 10 out of 15 reporting their results for PY2015 found CPC generated savings for at least one line of business or group of practices.

In addition to CPC care management fees, Medicare and around two-thirds of the other 36 participating payers also provided participating practices with the opportunity to share in savings in the total costs of care during the last three years of the initiative.[38] Payers shared with practices a portion of any savings accrued during 2014, 2015, and 2016, approximately 6 to 12 months after the end of each calendar year.

a. CPC shared savings methodologies

Payers' shared savings methodologies differed along several dimensions, including the level at which savings were calculated, the method used to calculate savings, and the quality measures used to determine whether practices were eligible to share in any savings (Table 3.2). Whereas some payers had to design their own approach to CPC shared savings, many payers (including both national and regional payers) used design elements from their existing shared savings programs. In the text box below, we describe several key elements of shared savings approaches used by payers. (See CMS 2017b and Peikes et al. 2016a for detailed descriptions of Medicare's shared savings approach.) CMS's shared savings calculations serve a different purpose than the evaluation and, as such, use a different approach than our impact analysis (DeLia 2016). (See Chapter 8 for additional information on the methodology used for and results from the CPC impact evaluation.)

---

[38] The following payers did not participate in shared savings: two national payers (one operating in one region and one operating in multiple regions), seven commercial regional payers, and Medicaid FFS in three regions. The national payer and one of the larger regional payers that did not offer shared savings provided practices with other incentive payments under their proprietary programs, such as pay-for-performance programs or risk-based capitation.

Key elements of payers' shared savings approaches

Method for calculating savings. Medicare and around half of other payers that reported on their shared savings approach calculated expected expenditures at the end of the performance year based on trending forward baseline costs. Actual expenditures were then compared with the expected expenditures to determine net savings. Other strategies used to calculate savings included comparing actual costs for CPC practices with either a comparison group of similar practices in the region or with all practices with whom the payer contracts in the region. Most payers, including Medicare, either included CPC care management fees in practices' actual expenditures or netted out CPC care management fees paid to practices from their shared savings calculation.

Groups for whom savings is calculated. To calculate savings, CPC payers typically either (1) combined all CPC practices for which a payer has attributed lives, or (2) combined certain practices, such as all those participating from a single health system/medical group or from a virtual group of unaffiliated practices. Following Medicare's lead, around one-third of non-Medicare payers used a regional approach. Some of these payers, however, pulled out one to two large group practices (that is, those with very large numbers of attributed lives in CPC, such as 5,000 or more) from the regional pool and calculated savings separately for each of these groups—in addition to the regional calculation for all other CPC practices.

Many CPC payers that combined groups of practices, as opposed to taking a regional approach, referenced their use of thresholds of 5,000, 7,500, or even 10,000 patients to produce reliable estimates of costs (because smaller groups show considerable volatility). Except for large systems/medical groups, this method often required combining nonaffiliated practices into a virtual group for performance purposes. Although a few payers noted that nonaffiliated practices were increasingly willing to participate in this approach—recognizing that virtual combining was necessary, because payers were becoming more focused on value-based purchasing—another payer reported mixed success with this approach, noting that these practice groups have worked best when a few leading practices organized the rest of the practices.

Adjustments and exclusions. To account for practices who see higher (or lower) risk patients, most CPC payers adjusted their shared savings calculations. Most commonly, payers used risk and case-mix adjustment (67 percent of payers who reported on their shared savings approach) and excluded high-cost outliers, such as patients with more than $250,000 in costs in the performance year (78 percent of payers).

Use of minimum savings rates, maximum percentage of savings shared, and caps on total savings distributions. Medicare and 43 percent of non-Medicare payers set minimum savings rates necessary to earn shared savings that ranged from 0.5 to 3 percent. In addition, the maximum percentage of savings that payers planned to share with practices ranged from 20 to 70 percent, with the most common maximum being 50 percent. A small number of payers indicated they planned to place caps (or maximums) on the total dollar value of shared savings distributions, and described these caps in a variety of ways, such as 10 percent of total costs or, in another case, $4 PMPM.

Determining whether practices are eligible to participate in shared savings. To qualify to share in any Medicare FFS savings, practices were required to reach a minimum number of quality points earned by surpassing national benchmarks on claims-based measures (calculated at the regional level), patient experience measures (calculated at the practice level), and nine electronic clinical quality measures (eCQMs) reported by practices to CMS.[a] Around half of non-Medicare payers reported that they planned to use the same quality metrics and benchmarks as CMS to reduce burden on practices; others planned to use different quality or efficiency measures and benchmarks. In addition, a few payers required that a practice be in good standing on CPC Milestones (that is, not on corrective action) to be eligible for a savings distribution.

Determining the amount of savings shared with practices. Medicare and two other payers varied the amount of savings shared with practices by the percentage of total costs saved. Perhaps most notably, Medicare increased the percentage shared as savings increased.[b] Another payer varied the percentage shared based on historical cost performance; that is, practices with historically high costs received a lower percentage of any savings, and practices with historically low costs received a higher percentage. Instead of savings corridors, some other payers used quality ladders—adjusting the size of a practice's shared savings distribution based on quality or efficiency metrics. Moreover, most payers that combined practices into groups or pooled for the region as a whole for purposes of shared savings also used the number of attributed patients to allocate savings among practices; some also considered the acuity of attributed patients at a practice.

[a] To qualify to share in any Medicare FFS savings, practices were required to reach a minimum number of quality points earned by surpassing benchmarks for the following measures: (1) three claims-based measures calculated at the regional level and benchmarked against national performance using the same thresholds as the Medicare Shared Savings Program; (2) five patient experience measures calculated at the practice-level and benchmarked against the Agency for Healthcare Research and Quality's Consumer Assessment of Healthcare Providers and Systems database; and (3) nine eCQMs reported by practices to CMS and benchmarked against Physician Quality Reporting System (PQRS) data. CMS required practices to report 9 out of 11 eCQMs in PY2014 and 9 out of 13 in PY2015 and PY2016. Measure reporting, instead of measure performance, was used to determine practices' eligibility for shared savings distributions for savings achieved in PY2014.

Key elements… *(continued)*

[b] Medicare's shared savings corridors: for savings of more than 1 percent and less than 2.3 percent, 10 percent of savings was shared; for savings of 2.3 to 3.5 percent, 10 percent was shared on savings between 1 and 2.3 percent, plus 30 percent was shared on savings between 2.3 and 3.5 percent; for savings of more than 3.5 percent, 50 percent of savings was shared.

Table 3.2. 2016 CPC shared savings methodologies among participating payers

		Other participating payers	
	Medicare FFS uses design feature?	Number of payers reporting on design feature[a]	Percentage using design feature, among those reporting
CPC costs are compared with		19	
Expected expenditures based on trending forward baseline costs	X		53
The costs of a comparison group of practices similar to CPC practices			21
The costs of all practices with whom payer contracts in the region			11
Other			16
Care management PMPM payments netted out of shared savings calculation (or incorporated into expenditures)	X	18	78
Group for whom savings were calculated		24	
All practices in the region[b]	X		30
Practice or groups of affiliated practices			41
Groups of unaffiliated practices			15
Adjustments to savings calculations		18	
Excludes high cost outliers			78
Adjusts for demographic characteristics or population risk	X		67
Minimum savings rate to earn shared savings	X	21	43
Maximum percentage of total dollar savings shared with practices		18	
Less than 50			44
50	X		50
More than 50			6
Metrics used to determine whether practices are eligible to receive share of savings		15	
Practice performance on quality metrics	X		80
Practice performance on efficiency metrics			47
In good standing for CPC/not on corrective action			47
None (all practices are automatically eligible)			7
Factors used to determine the amount of savings shared with practices		17	
Number of attributed patients	X		88
Acuity of attributed patients	X		24
Practice performance on quality metrics			53
Practice performance on efficiency metrics			29
Other			6

Source: CPC payer worksheets and Mathematica interviews with CPC payers conducted June through October 2015 and 2016.

Note: Response categories are not mutually exclusive.

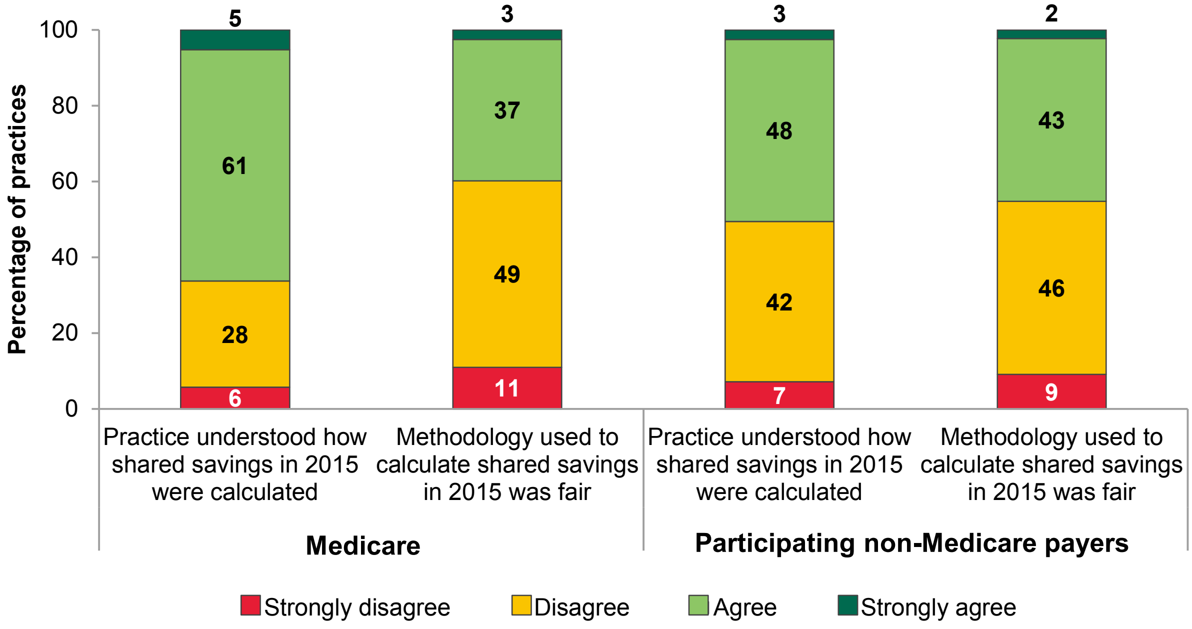
[a] Some payers declined to report on certain aspects of their shared savings methodologies. Each table row indicates the number of payers that reported on a given feature. Payers operating in more than one region are counted multiple times, once for each region in which they participate.

[b] That is, all CPC practices with which the payer has attributed lives. Payers calculating savings for all practices in a region include payers doing so separately by line of business.

FFS = fee-for-service; PMPM = per member per month.

Many practices were frustrated with shared savings approaches used by Medicare and other payers. In the 2016 CPC practice survey, about two-thirds of CPC practices agreed or strongly agreed that they understood Medicare's shared savings methodology, whereas just over half indicated they understood non-Medicare payers' methodologies (Figure 3.4). Moreover, 60 percent of practices indicated they disagreed (49 percent) or strongly disagreed (11 percent) that the methodology used by Medicare to calculate shared savings in 2015 was fair (Figure 3.4). A similar proportion of practices reported concerns with other payers' shared savings methodologies. (At the time the 2016 CPC practice survey was fielded, Medicare FFS had only reported the results of its shared savings calculations for PY2014. For that year, CMS found that CPC generated savings for practices in Oklahoma only. A higher proportion of Oklahoma practices [67 percent] than practices in other regions reported that the methodology Medicare used to calculate shared savings was fair.)

Figure 3.4. Practices' perceptions in PY2016 of Medicare and non-Medicare shared savings methodologies for assessing PY2015 performance



Source: CPC practice survey administered April through August 2016.

Our 2016 interviews with deep-dive practices selected for intensive qualitative study provided some insights into practices' frustration with Medicare's shared savings methodology:

- Several practices felt it was unfair that Medicare calculated shared savings for all practices in a region instead of calculating savings for individual practices or groups of affiliated practices. As one practice expressed, "I'm not afraid of having goals and trying to achieve those goals as long as I'm judged on my efforts, good or bad, and not based on a whole group [in the region]."

- A few practices also expressed frustration with the quality measures Medicare used to determine whether practices were eligible to participate in shared savings. For instance, one expressed the concern that quality measures calculated for small practices were unreliable due to small sample sizes, and another indicated that its EHR was inaccurately reporting on electronic clinical quality measures (eCQMs).
- In addition, a few practices reported that Medicare's shared savings methodology held them responsible for reducing costs incurred by specialists or hospitals that they felt were outside of their control.

For CPC+, instead of using shared savings to reward practices for cost and quality performance, CMS is using a prospective performance-based incentive payment. Specifically, CMS pays CPC+ practices an incentive payment at the beginning of the year that may be partially or fully recouped at the end of the year if a practice does not meet cost and efficiency standards. CMS transitioned its approach due to concerns practices raised about its shared savings methodology for CPC. In addition to moving from a retrospective shared savings payment to a prospective incentive payment, CMS strengthened the incentive in CPC+ by placing it at the level of the individual practice rather than at the region level.

b. Shared savings payments to CPC practices

CMS found that CPC generated savings in at least one region for PY2014, PY2015, and PY2016 performance. Specifically, CMS paid practices shared savings payments totaling $658.1 thousand for PY2014 performance, $13.1 million for PY2015 performance, and $10 million for PY2016 performance. Oklahoma was the only region for which CMS found that CPC generated savings for each of the three program years (Table 3.3). CMS found that CPC generated savings in Arkansas in PY2015 and PY2016 and in Colorado and Oregon for PY2015 only.

Fifteen non-CMS payers reported to Mathematica results of their shared savings calculations for PY2015 performance (Table 3.4). Among those payers, two payers each in Arkansas, Colorado, New York, and Oregon and one each in New Jersey and Ohio/Kentucky found CPC generated savings in PY2015 for at least one line of business or group of practices. For PY2014 performance, 20 non-CMS payers reported results: two payers each in Colorado, Ohio/Kentucky, and Oklahoma, as well as one payer each in Arkansas, New Jersey, New York, and Oregon, found CPC to generate savings. During our final round of CPC data collection, no payers had finalized their shared savings calculations for PY2016 performance.

Table 3.3. Results from CPC Medicare FFS shared savings calculations for performance in PY2014, PY2015, and PY2016 by region

	PY2014			PY2015			PY2016		
	Percentage change in net expenditures [a]	Number of practices receiving payments [b]	Average payment per practice[c]	Percentage change in net expenditures [a]	Number of practices receiving payments [b]	Average payment per practice[c]	Percentage change in net expenditures [a]	Number of practices receiving payments [b]	Average payment per practice[c]
AR	1.1	0	$0	-2.4	56	$13,376	-2.7	54	$13,520
CO	-0.3	0	$0	-2.2	65	$7,094	2.1	0	$0
NJ	2.4	0	$0	5.7	0	$0	4.5	0	$0
NY	5.7	0	$0	5.3	0	$0	5.4	0	$0
OH/KY	1.6	0	$0	2.2	0	$0	6.8	0	$0
OK	-2.4	56	$10,009	-5.4	52	$208,909	-4.0	59	$122,859
OR	1.7	0	$0	-2.6	66	$15,783	0.9	0	$0

Source: CMS CPC PY2014, PY2015, and PY2016 Shared Savings & Quality Results.

[a] Expenditures include the care management fees that Medicare paid CPC practices. A negative value for change in net expenditures indicates savings compared with relative trended targets; a positive value indicates higher costs relative to trended targets.

[b] To qualify to share in any Medicare (fee-for-service) FFS savings, practices were required to reach a minimum number of quality points earned by surpassing benchmarks for the following measures: (1) three claims-based measures calculated at the regional level and benchmarked against national performance using the same thresholds as the Medicare Shared Savings Program; (2) five patient experience measures calculated at the practice-level and benchmarked against the Agency for Healthcare Research and Quality's Consumer Assessment of Healthcare Providers and Systems database; and (3) nine electronic clinical quality measures (eCQMs) reported by practices to CMS and benchmarked against Physician Quality Reporting System (PQRS) data. CMS required practices to report 9 out of 11 eCQMs in PY2014 and 9 out of 13 in PY2015 and PY2016. Measure reporting, instead of measure performance, was used to determine practices' eligibility for shared savings distributions for savings achieved in PY2014.

[c] Medicare increases the percentage shared as savings increase. Medicare's shared savings corridors: for savings of more than 1 percent and less than 2.3 percent, 10 percent of savings was shared; for savings of 2.3 to 3.5 percent, 10 percent was shared on savings between 1 and 2.3 percent, plus 30 percent was shared on savings between 2.3 and 3.5 percent; for savings of more than 3.5 percent, 50 percent of savings was shared.

Table 3.4. Payers reporting that CPC generated savings for PY2014 or PY2015, among those reporting results of their shared savings calculations, by region

	PY2014 performance		PY2015 performance	
	Medicare FFS found CPC generated savings	Number of non-Medicare payers that found CPC generated savings	Medicare FFS found CPC generated savings	Number of non-Medicare payers that found CPC generated savings
AR	0	1 of 2	X	2 of 2
CO	0	2 of 4	X	2 of 4
NJ	0	1 of 2	0	1 of 1
NY	0	1 of 3	0	2 of 3
OH/KY	0	2 of 4	0	1 of 1
OK	X	2 of 2	X	0 of 0
OR	0	1 of 3	X	2 of 4
Total	**1 of 7 regions**	**10 of 20 payers**	**4 of 7 regions**	**10 of 15 payers**

Source: CPC payer worksheets and interviews.

Notes: This table includes only Medicare FFS and non-Medicare payers that shared savings and reported their results to Mathematica. Payers are counted separately for each region in which they participate.

FFS = fee-for-service.

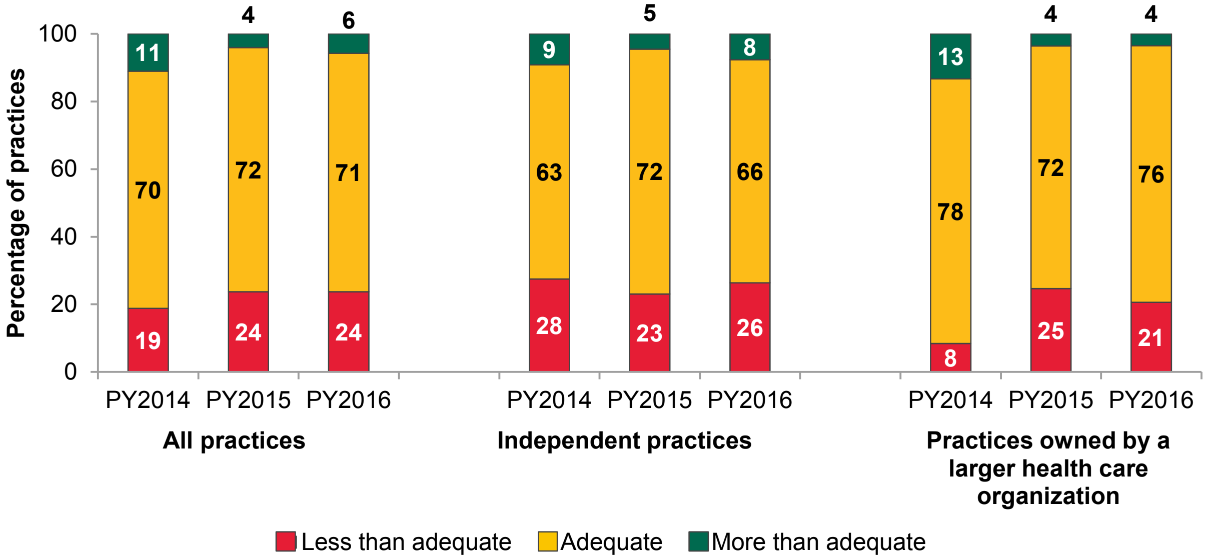
3.3.3. Practices' use of and perspectives on CPC payments

CPC practices generally found CPC enhanced payments were adequate to pay for staff labor and other supports needed to implement CPC.

Practices generally perceived Medicare FFS enhanced funding to be adequate relative to the costs of implementing CPC, even following the decrease in care management fees in PY2015 (Figure 3.5). More than three-quarters of practices reported on the 2014, 2015, and 2016 CPC practice surveys that CPC payments from Medicare FFS were adequate or more than adequate relative to the costs of implementing CPC.

Although practices owned by a larger health care organization were more likely to perceive fees as adequate or more than adequate than their independent counterparts in PY2014, this difference did not persist in the PY2015 and PY2016 surveys. The percentage of practices owned by a larger health care organization that perceived Medicare FFS care management fees to be adequate or more than adequate decreased from 92 percent in PY2014 to 80 percent in PY2016. This finding may in part reflect the larger decrease in CPC payments per practice and per attributed life reported by practices owned by a larger health care organization than independent practices following Medicare FFS reduction in PBPM levels in PY2015.

Figure 3.5. Practices' perceived adequacy of Medicare FFS care management fees relative to the costs of implementing CPC in PY2014, PY2015, and PY2016



Source: CPC practice survey, administered April through July 2014 and April through August 2015 and 2016.

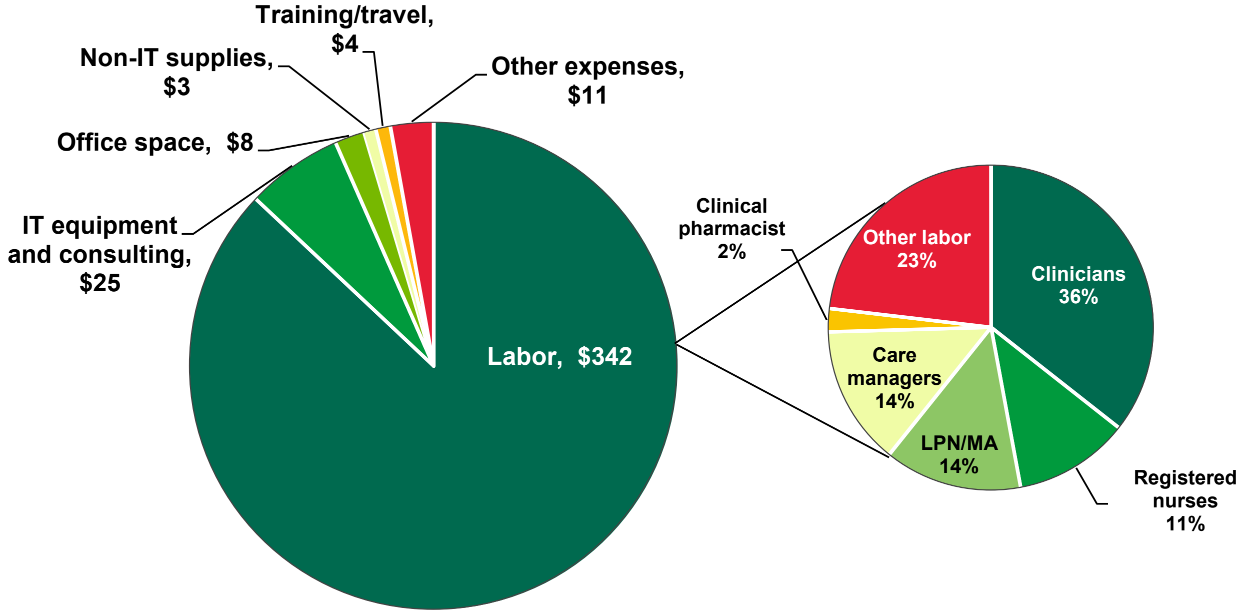
Note: We identified each practice as being part of a system or not, using the practice's responses to the 2016 CPC practice survey. When asked to describe the medical organization that employs the clinicians at the practice site, or who owns the practice, we considered practices that responded with these responses to be in a healthcare system: group or staff model Health Maintenance Organization (HMO); network of clinician practices owned by a hospital, hospital system, or medical school; or hospital or medical school.

Columns may not add up to 100 percent due to rounding.

Practices' ratings of the adequacy of other participating payers' practice payments varied among regions and payers but were generally lower than their ratings of Medicare payments. Roughly half of practices rated the other payers' CPC payments as inadequate.

Practices reported using CPC enhanced funding to support similar amounts of labor and nonlabor costs in PY2014, PY2015, and PY2016.[39] Labor costs were the largest area of spending, accounting for about 87 percent of total practice-reported CPC spending during the last three years of CPC (Figure 3.6). For each year, the largest categories of labor costs were clinicians—which include physicians, physician assistants, and nurse practitioners ($121.9 million); care managers ($47.2 million); licensed practical nurses and medical assistants ($46.7 million); and registered nurses ($39.3 million). (In some practices, registered nurses, licensed practical nurses, and medical assistants provided care management services as part of their responsibilities.) After labor, practices reported spending the most CPC funding on information technology (IT) equipment or consulting ($25 million). Practices also used CPC funding for non-IT equipment, office space, and training or travel (for example, to in-person learning meetings or similar activities). Chapter 5 of this report describes how practices devoted staff time, health IT, and other resources to meeting CPC Milestones.

Figure 3.6. Practice-reported total CPC spending in PY2014, PY2015, and PY2016 for selected cost categories, in millions



Source: Practice-reported budget data analyzed by CMS's monitoring and compliance contractor for PY2014 and PY2015 and Mathematica PY2016.

Note: Practices did not report spending by these cost categories in PY2013. Clinicians includes physicians, physician assistants, and nurse practitioners.

IT = information technology; LPN = licensed practical nurse; MA = medical assistant.

---

[39] Practices reported spending by CPC Milestone instead of cost type (such as labor) in PY2013. These data are reported in the first annual report for the CPC evaluation (Taylor et al. 2015).

3.4. Data feedback provided to CPC practices

In addition to enhanced payments, CMS and most participating payers provided CPC practices with performance feedback data to support building a culture of continuous improvement driven by data. As part of its evaluation contract, Mathematica Policy Research produced the Medicare FFS data feedback reports and patient-level data files for CMS. In this section, we first describe the data feedback CMS and other payers provided to participating practices. We give an overview of CPC data feedback and then describe in additional detail the feedback from individual payers and efforts to align data feedback. Finally, we describe practices' use of and perspectives on CPC data feedback.

3.4.1. Data feedback from CMS and other payers

CMS and most other payers provided data feedback to CPC practices. Over the course of CPC, payers improved data feedback by incorporating additional measures, improving the timeliness of data, and aligning or aggregating data across payers.

In PY2015 and PY2016, CMS and all but 4 of the 36 non-CMS payers (89 percent) provided data feedback to practices, an increase from the first two years of the initiative, during which about two-thirds of payers did so (68 percent).[40] At the outset of CPC, payers primarily provided practices with individual payer reports. The content and structure of this feedback was designed by each payer individually, often based on data feedback they were already providing to practices before CPC. Most payers took steps over the four-year initiative to provide new or additional forms of data feedback to practices or to improve existing reports. Payers in six regions also worked to align the content and timing of feedback across payers in a given region. Ultimately, payers in five regions developed a common approach to data feedback. Specifically, payers in Arkansas and Oregon took steps to align the cost and service use measures included in individual reports with each other and Medicare FFS. Payers in Colorado, Ohio/Kentucky, and Oklahoma achieved data aggregation—producing a single report or tool that aggregated data across payers (non-Medicare FFS payers aggregated data first, and then Medicare FFS joined those efforts).

a. Feedback from individual payers

Medicare FFS feedback reports. Starting in April 2013, CMS began to provide quarterly Medicare FFS practice-level feedback reports and patient-level data files to participating practices. Each CPC Medicare performance feedback report included (1) a practice-level PDF report with summary information about Medicare patients attributed to the practice, their costs, and their use of hospital inpatient and emergency department services; and (2) a Microsoft Excel file with detailed information about each patient's demographic characteristics and Medicare FFS costs and service use. (See the text box below describing the Medicare FFS data feedback content.)

---

[40] Four payers did not complete interviews in 2016. We used the most recently available data on the data feedback they provided to practices.

CMS and Mathematica revised the reporting templates, data displays, and specifications of the Medicare FFS data feedback over the course of the initiative based on input from practices and RLF, in an effort to continuously improve the reports and make them useful. For example, CMS added data on trends in performance over time and started risk-adjusting cost data to account for additional patient-level characteristics to improve comparability across practices with different patient populations. In addition, CPC practices and RLF in some regions, noting that costs incurred as a result of specialty care from other providers were a significant driver of patients' total costs, requested more detailed information on specialty care. In response, CMS worked with CPC practices in an iterative process to pilot-test, refine, and share practice-specific reports on specialty care. This process resulted in a one-time detailed report in May 2016 about CPC patients' specialist visits and spending on specialty care for 2015 broken down by specialty type. Specialist care data were intended to help practices (1) understand how different specialties contribute to the total cost of care for their patient panel, and (2) identify individual specialists that account for the highest proportion of specialist visits and costs for their patients, suggesting opportunities for improved care coordination.

Medicare FFS data feedback for CPC practices

The CMS quarterly feedback reports provided practice-level information on:

- Characteristics of attributed Medicare FFS patients and how these patients compare with those of other CPC practices in the same region
- Risk-adjusted Medicare expenditures PBPM, including average total expenditures and expenditures by type of service; also, annualized use of Medicare services and selected outcomes three to six months before the report was released, including all-cause hospitalizations, hospitalizations for ambulatory care sensitive conditions, overall and outpatient emergency department visits, and unplanned 30-day hospital readmissions. Both risk-adjusted Medicare expenditures and use of services were:
    - Compared with those of all CPC practices in the region, overall and for high-risk patients
    - Compared over time to their own experience and to that of all CPC practices in the same region with a similar risk profile
- Responses from surveys of CPC practices about approaches to primary care delivery and practice demographics; surveys of patients about their experience with care; and CPC-wide data from clinicians and staff about their experiences delivering care

Patient-level data files accompanying the feedback reports provided the following patient-level information for beneficiaries attributed to each practice in the current quarter:

- Beneficiary identifiers (patient identification number, last name, first name, age, gender, Medicaid enrollment, or dual eligibility status)
- CPC HCC-risk category
- Total Medicare expenditures and percentage breakdown by service category
- Use of primary care and specialist physician services
- Hospital admissions (overall, and for ambulatory care sensitive conditions)
- Unplanned 30-day readmissions
- Emergency department visits

Practices could download the practice-level report and patient-level data files from the CPC web application.

Other payers' feedback reports. At the outset of CPC, all payers that offered data feedback to practices (approximately two-thirds of payers) provided individual payer reports. The proportion of payers providing individual data feedback decreased over time as some payers transitioned to providing aligned or aggregated data feedback (see section below). Individual payers' reports primarily contained measures of cost and service utilization, although some payers also reported quality measures (such as rates of colorectal cancer screening and childhood immunizations). Some payers supplemented claims-based data feedback reports with close-to-real-time data on patients' emergency department (ED) and inpatient admissions, discharges, and transfers (in the form of weekly or even almost daily rosters). In addition, some payers provided practices with lists of care gaps for patients (such as patients due for breast cancer screening or patients with diabetes who need eye exams). Payers noted that practices like to know about "the care opportunities to go after," and lists of gaps in care give practices concrete areas for improvement.

Largely in response to practices' input on data feedback, most payers worked to improve their feedback reports over the course of the initiative. Changes included adding detailed patient-level data, incorporating data on utilization of ancillary services (such as labs), improving the timeliness of ED and inpatient admission data, and using interactive portals (instead of static reports) to disseminate data feedback. Also similar to CMS, some other payers began providing practices with data on specialists seen by their patient panel.

b. Aligned or aggregated data feedback

As part of their participation in CPC, CMS and other payers agreed at the start of CPC to work together to develop a common approach to data feedback. Payers in all regions but New Jersey initially pursued data aggregation—that is, producing one report that aggregates data across payers. Payers indicated that aggregated data were intended to help practices to better understand their overall performance on cost, quality, and use measures and identify areas for improvement in care delivery without the burden of accessing and interpreting multiple payer-specific reports. Additionally, data aggregation aimed to reduce the time practices spent sorting through and analyzing individual reports from multiple payers.

Data aggregation, however, proved challenging in all regions (Peikes et al. 2016a). Payers reported being surprised by the cost of data aggregation and the time required to devise and implement an aggregation plan (see Text Box for a list of design decisions involved in data aggregation). Additionally, during PY2013, CMS had to change its approach to contracting for data aggregation several times due to unforeseen legal and operational hurdles that delayed CMS participation and required payers to restart or rework their processes. Ultimately, CMS decided to have other payers in each region take the lead and design an approach that would work for their regional context; CMS subsequently joined their efforts.

Important data aggregation design decisions

Establishing the data aggregation management infrastructure:
- Select a vendor to aggregate the data and create the tool or report
- Develop a governance structure to address ongoing policy and technical issues
- Decide how to allocate the costs of aggregation across payers
- Develop a process to train practices on how to use aggregated data

Determining the content and structure of the tool or report:
- Decide on the level of claims information to share (for example, patient and/or practice)
- Agree how to benchmark performance
- Select a platform to display the data
- Address data validity and comparability challenges (such as, approaches to risk-adjust data and attribute patients to practices)

Faced with these challenges, regions ultimately varied in the extent to which payers aligned data feedback for CPC practices. By the end of CPC:

- The Colorado, Ohio/Kentucky, and Oklahoma regions produced aggregated reports or tools from their payers' claims data. The Colorado tool allowed practices to create lists of patients who had not received preventive care services, reports on care delivered by specialists, and analyses on the use of generic versus brand name drugs, for example. In Ohio, practices received reports that included displays of trends in spending by type of service as well as inpatient admissions and emergency department visits. Non-CMS payers in Colorado first released their tool in PY2015; non-CMS payers in Ohio/Kentucky and Oklahoma began producing reports in PY2016 (Table 3.5.).[41] Payers in Colorado and Oklahoma paid all costs for data aggregation; in Ohio/Kentucky, practices covered half the cost of data aggregation. After producing their first aggregated reports, payers worked with their data aggregation vendors to improve the usefulness of aggregated data by simplifying displays and addressing data inconsistences. For example, Colorado payers, concerned that the data feedback tool required practices to make too many choices among display and drill-down options to produce a report, urged the vendor to produce "bookmarks" with preset filters so that practices could produce standard reports with a single click. CMS faced substantial contracting delays because the federal government's procurement processes were not set up for joining with other entities, such as private payers. However, overcoming these hurdles, CMS joined claims-based data aggregation efforts in these regions in September 2015, although CMS data were not fully integrated until 2016. (Appendix C details the data aggregation management infrastructure in each region and the content and structure of aggregated reports.)

- Payers in Arkansas and Oregon aligned individual reports in terms of content or structure. Noting early challenges and delays with data aggregation, payers in these two regions indicated that aligned reports were a more feasible, timely, and affordable common approach to data feedback. In PY2014, payers in each region selected a set of common measures to report on that aligned at least partially with the measures included in Medicare FFS data feedback (Table 3.6).[42] Arkansas payers were generally satisfied with the aligned reports and improved them over time by aligning measure specifications and adding aligned patient-level data files to the practice-level reports. In contrast, several Oregon payers voiced concern that the reports had limited utility for practices because although the Oregon payers used the same measures and reporting format, measure specifications still differed across payers.
- Payers in New York and New Jersey did not ultimately pursue a common approach to data feedback. New York payers spent considerable time during the first three years of CPC discussing data aggregation but ultimately decided they did not have sufficient time remaining in the initiative to justify the cost of pursuing aligned or aggregated reports. In contrast, New Jersey payers decided early in the initiative not to pursue a common approach to data feedback given that two payers (one of which was Medicare) accounted for a large proportion of attributed CPC lives in the region and, thus, aligning feedback had limited value.

---

[41] Before producing reports that aggregated patient-level claims data, payers in Oklahoma provided practices reports that aggregated practice-level data.

[42] Payers in Ohio/Kentucky began producing aligned reports in PY2014 but stopped after releasing aggregated reports.

Table 3.5. Timing and structure of aggregated data feedback from payers' claims data in Colorado, Ohio/Kentucky, and Oklahoma, PY2016

Region	Non-CMS payers participating in data aggregation	Start date for data aggregation	Date Medicare data included	Frequency of data refresh
Colorado	6 of 8	June 2015	September 2016	Quarterly
Ohio/Kentucky	8 of 8	January 2016	June 2016	Quarterly
Oklahoma	3 of 3	November 2016[a]	November 2016	Quarterly

Source: Mathematica interviews with CPC payers in June through August 2016.

[a] In PY2015, payers in Oklahoma began providing practices with reports that aggregated practice-level data (as opposed to patient-level claims data).

Table 3.6. Content and structure of aligned feedback reports in Arkansas and Oregon, PY2016

Region[a]	Participating non-Medicare payers	Start date	Frequency	Common set of measures	Measures specifications aligned	Report format aligned	Patient-level data aligned
Arkansas	3 of 3[b]	Fall 2014	Quarterly	Yes	Yes	No	Yes
Oregon	3 of 5	Spring 2014	Quarterly	Yes	No	Yes	No

Source: Mathematica interviews with CPC payers in June through August 2016.

[a] Payers in Ohio/Kentucky began producing aligned reports in PY2014 but stopped after releasing aggregated reports.

[b] We excluded one payer in Arkansas because it did not participate in an interview.

3.4.2. Practices' use of and perspectives on CPC data feedback

CPC practices valued data feedback, although their use of such feedback varied across regions and practices and depended on the type of report.

a. Practices' use of CPC data feedback

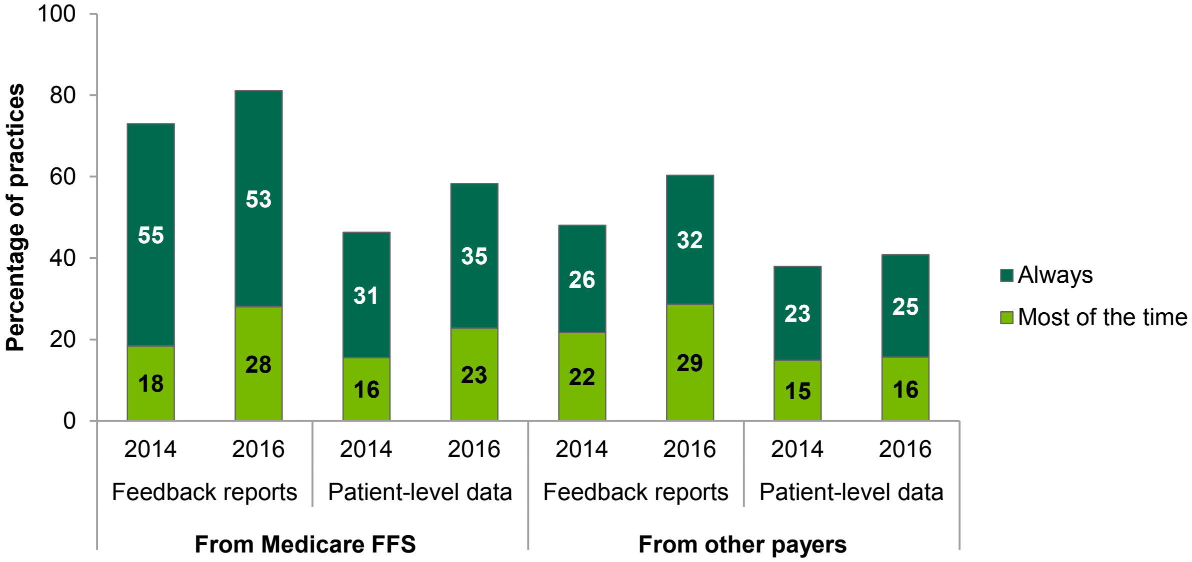
In PY2016, most practices reported reviewing practice-level data feedback from Medicare FFS (97 percent) and other payers (89 percent). Similarly, most practices reported reviewing patient-level data files from Medicare FFS (88 percent) and other payers (80 percent). Although most practices reported having reviewed data feedback, the frequency with which practices reviewed reports varied (Figure 3.7; see Appendix C for additional detail on practices' review of and perspectives on data feedback):

- More practices reported reviewing data feedback from Medicare FFS all or most of the time than reported reviewing data feedback from other payers all of most of the time.
- For both Medicare FFS and other payers' feedback, practices reported reviewing practice-level reports more frequently than patient-level data files.
- The percentage of practices that reported reviewing feedback all or most of the time increased slightly from 2014 to 2016. Most notably, the percentage of practices that reported

frequently reviewing other payers' practice-level feedback reports increased from 48 percent in PY2014 to 60 percent in PY2016.

- The percentage of practices that reported frequently reviewing reports in 2014 varied widely across regions; however, by 2016, regional variation had declined with one notable exception. Practices in Oregon were less likely to report reviewing all types of data feedback in 2016 than practices in other regions (Table 3.7).

Figure 3.7. Percentage of practices that reported receiving and reviewing CPC data feedback all or most of the time, PY2014 and PY2016



Source: CPC practice survey, administered April through July 2014 and April through August 2016.

Table 3.7. Percentage of practices that reported receiving and reviewing feedback reports and patient-level data files all or most of the time in 2016, CPC-wide and by region

	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Medicare FFS feedback reports	81	85	80	87	88	86	88	55
Medicare FFS patient-level data files	58	57	49	56	62	69	77	38
Other payer feedback reports	60	60	67	67	72	59	58	40
Other payer patient-level data files	41	33	47	44	53	38	45	25

Source: CPC practice survey, administered April through August 2016.

Note: The denominator includes practices that reported not receiving reports. Slight differences between the numbers included in Figure 3.7 and Table 3.7 may have occurred due to rounding.

FFS = fee-for-service.

The 2016 CPC clinician and staff survey (which was fielded to a sample of clinicians and staff in CPC practices and only clinicians in comparison practices) indicated that a high proportion of physicians in both CPC practices and comparison practices had seen feedback reports on their performance in the prior year. Although rates were high for both groups, physicians in CPC practices were more likely than physicians in comparison practices to report seeing data feedback (88 versus 71 percent).

CPC physicians were more likely to report in the 2016 CPC clinician and staff survey seeing feedback from Medicare if they were in smaller versus bigger practices or if they were independent practices versus part of a system.[43] Consistent with this finding, on the 2016 CPC practice survey, 27 percent of practices that are part of a health care system reported that feedback reports are reviewed by staff at only their larger health care system or medical group (not by staff at the practices themselves). However, physicians who reported not seeing Medicare feedback reports may have seen the information after others in the practice (or system, if the practice was system-owned) repackaged it into different formats, and reports from multiple payers may have been confusing.

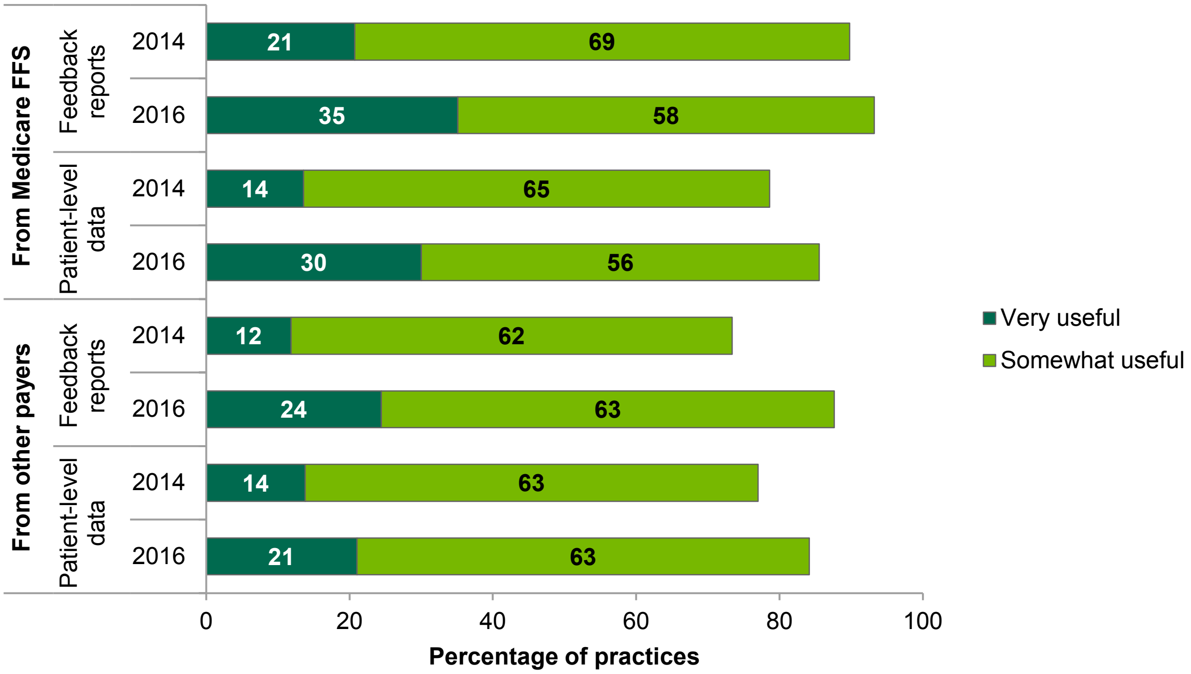
b. Practices' perspectives on usefulness of CPC data feedback

Practices reported that they found feedback reports and patient-level data files valuable but faced challenges in using them. On the CPC practice survey, more than 80 percent of CPC practices that reviewed feedback from Medicare FFS or other payers reported the information was somewhat or very useful in meeting CPC Milestones and improving primary care (Figure 3.8). From PY2014 to PY2016, the percentage of CPC practices reporting that data feedback was very useful increased for each type of feedback.

---

[43] We identified each practice as being part of a system or not, using the practice's responses to the 2016 CPC practice survey. When asked to describe the medical organization that employs the clinicians at the practice site, or who owns the practice, we considered practices that responded with these responses to be in a healthcare system: group or staff model Health Maintenance Organization (HMO); network of clinician practices owned by a hospital, hospital system, or medical school; or hospital or medical school.

Figure 3.8. Percentage of practices reporting that CPC data feedback was somewhat or very useful, among practices that reported seeing the feedback, PY2014 and PY2016



Source: CPC practice survey, administered April through July 2014 and April through August 2016.

During 2016 interviews with deep-dive practices selected for intensive qualitative study, some practices reported using CPC data feedback to identify goals for their quality improvement work. For example, one practice indicated that data feedback reports helped it identify reducing referrals to laboratory services as a strategy to decrease total costs of care for its patients. To reduce those referrals, the practice established guidelines that limited when practice members ordered follow-up laboratory tests. Another practice noticed that ED use was a major cost driver for its patients. In response, the practice reached out to patients who had visited the ED to remind them that they should call the practice before going to an ED. Other practices reported using data feedback to better identify high-risk patients or to increase prescribing of generic drugs.

Although practices viewed data feedback as valuable, our interviews with deep-dive practices, payers, and RLF identified several challenges practices faced in using it. We outline in the following section the major challenges and the steps CMS, payers, and RLF took to help practices address them (Gerteis et al. forthcoming).

Challenges CPC practices faced using data feedback:

- Practices sometimes found the reports difficult to understand. At the outset of the initiative, practices indicated the reports were complex and included a vast amount of information, impeding their perceived usefulness. Many were also unfamiliar with the metrics reported, including standardized utilization rates and comparative benchmarks.

- Some practices lacked the time or skills to use data feedback effectively. Their ability to understand and use the reports depended in large part on the resources available to help them. Feedback from RLF and in-depth interviews with deep-dive practices suggested that smaller practices, in particular, tended to have limited experience using data for improvement and lacked the staff time, resources, and analytic capacity to help them interpret the quarterly reports.
- Practices sometimes looked for and expected data feedback to help them manage patients in real time. The inherent lag in claims data means that the reports cannot easily be used to determine the short-term impact of discrete interventions on cost or service use or to identify patients with time-sensitive care gaps.[44] This challenge was especially frustrating to practices that lacked ready access to information from other sources, such as EHR systems or notifications about admissions to local hospitals, to monitor patients over the shorter term.
- Practices often viewed factors driving high costs as out of their control. Some practices doubted that factors driving patients' resource use and total costs of care in an aging population and an FFS environment—hospital admissions, ED use, specialty care, and post-acute care—are amenable to a primary care practice's influence. Practices reported that specialists, hospitals, or patients—not just the primary care practice—needed to change their behavior.

To address these challenges, CMS and other payers:

- Took steps to improve data feedback. For example, some payers worked to reduce the lag in claims data or began using interactive portals instead of static reports.
- Provided practices additional types of feedback. For example, CMS and some payers began providing detailed patient-level data to help practices identify high-cost patients. In addition, a number of payers began providing practices with reports on specialists' costs and use in 2016 to help them strategize ways to influence costs sometimes viewed as out of their control. Several deep-dive practices reported using them to, for example, identify unnecessary specialist encounters and procedures or lower-cost specialists for future patient referrals.
- Educated practices about data feedback. Starting in PY2014, RLF increasingly focused on educating practices about the existence of various reports and how to use them. For example, RLF encouraged practices to use claims data for identifying opportunities to improve care delivery in general, rather than evaluating quality improvement (QI) interventions in real time, or supporting individual patient care decisions. As one practice explained, "I think payer reports are definitely very helpful, but I had to learn how to read them more efficiently and to take into account different things that I might not have thought of when they were first sent out to us." This shift in educational strategy corresponded with CMS adjusting the requirements for Milestone 5: Quality Improvement to require practices to use payer feedback to identify areas for improvement. Payers, mostly in regions aggregating data, also provided practices with training on how to access and use reports—

---

[44] The lag between the date of service and when the practice received the Medicare FFS feedback reports was three to six months. For the CPC regions that aggregated data, the lag for reports was three to six months for Colorado, six months for Oklahoma, and eight months for Ohio/Kentucky. The lag times for other payers' feedback varied.

either directly or in collaboration with the region's data aggregation vendor, RLF, or both. (See Section 3.5 for additional detail on RLF's and payers' learning strategies.)

3.5. Learning supports provided to CPC practices

In addition to enhanced payments and data feedback that CMS and other payers provided to practices, CMS and RLF provided learning activities for CPC practices. In this section, we first describe the learning infrastructure developed by CMS and its contractors. We provide an overview of activities offered by RLF and practices' participation in those activities and then detail the CPC group learning activities and individualized practice coaching. Next, we describe non-Medicare payers' involvement with CPC learning, the extent of their involvement, and how much support they provided to practices through other initiatives. Finally, we describe practices' reported experience with CPC learning support.

3.5.1. Learning support from CMS

CMS and its contractors provided CPC practices with substantial learning support, including a variety of group learning activities and—for a subset of practices—individualized coaching.

CPC required participating practices to make many complex, interconnected changes in care delivery. CPC practices needed a variety of supports to achieve the aims of CPC, such as guidance on how to approach CPC Milestones, challenges to implementing those approaches, and CPC administrative requirements (such as Milestone reporting). The type and level of assistance practices needed varied depending on practices' characteristics such as ownership status (for example, independent versus owned by a larger health care organization), internal resources to support quality improvement, and experience working on similar initiatives.

CMS and RLF designed a learning infrastructure that aimed to use finite resources to meet diverse practice needs. RLF provided CPC practices a variety of learning activities, consisting of a mix of cross-regional and region-specific activities. Cross-regional learning activities focused on educating practices on CPC requirements (for example, the Milestone reporting process) and sharing information on how to meet Milestones that RLF recognized as challenging across regions. Regional learning activities were more tailored to practice needs and regional context. In Table 3.8, we describe CPC learning supports, including group learning sessions and, for a subset of practices, individualized practice coaching.

During the first year of the initiative, CPC learning support focused on explaining the model and the requirements for practices. In the second program year, CMS learning support shifted to more peer-driven, interactive learning activities aimed at helping practices adopt new strategies and approaches to achieving CPC's aims and Milestones; it maintained that focus through the end of the initiative. Over the course of the initiative, RLF also increasingly used data from practices' Milestone reports and Medicare FFS feedback reports to identify practices in need of additional support and/or to tailor their assistance to practices.

Table 3.8. Description of CPC learning support

Learning activity (years offered)	**Description**	**Purpose**
Cross-regional group learning		
National webinars (2013–2016)	CMS and TMF hosted webinars for all CPC practices.	• Educated practices on CPC requirements • Shared information across regions on meeting aspects of Milestones that were challenging • Highlighted exemplary practices to encourage cross-regional learning
Action groups (Milestone, 2014–early 2015; Rapid-cycle, late 2015–2016)	TMF or RLF hosted web-based meetings for practices working on similar Milestone activities. Practices were encouraged to implement small tests of change between meetings. Transitioned from yearlong Milestone action groups to rapid-cycle groups focused on implementing specific components of Milestones.	• Encouraged practices to make small tests of change • Provided opportunities for peer-to-peer-learning • Promoted sharing of best practices across regions
EHR affinity groups (2014–2016)	TMF or RLF hosted conference calls with groups of practices that used the same EHR. Health IT vendors were encouraged to join, though their participation was infrequent.	• Facilitated EHR-related problem-solving across regions • Aimed to connect practices with vendor representatives, though vendor participation was infrequent
CPC online knowledge management and collaboration tool (CPC collaboration site, 2013–2015; CPC Connect, late 2015–2016)	CMS, TMF, and RLF monitored collaboration site and encouraged practices to use it to raise questions about the initiative and share tools, resources, and best practices for implementation. Discussion forums existed for each action group and EHR affinity group.	• Provided practices with access to training and technical assistance documents • Answered practice questions on CPC requirements and Milestones • Encouraged peer-to-peer learning and networking between practices
Regional group learning		
All-day learning sessions (2013–2016)	RLF hosted biannual meetings in each region, both in-person and virtual (while in-person sessions were preferred, they were sometimes logistically impossible).	• Provided training on CPC Milestones tailored to regional needs and context • Highlighted Milestone strategies used by practices • Encouraged peer-to-peer learning and networking between practices
Regional webinars (2013–2016)	RLF hosted a series of one-hour webinars for practices in their region. The frequency of regional webinars varied overtime and by region.	• Shared information on CPC Milestones tailored to regional needs and context • Highlighted Milestone strategies used by practices in the region
Virtual learning sessions (2014–2016)	RLF hosted two-hour webinars for practices in their region twice a year, typically covering Milestone implementation topics.	• Permitted an in-depth look at a Milestone or practice transformation topic • Shared information and best practices tailored to regional needs and context
Office-hour sessions (2013–2015)	TMF or RLF hosted virtual office-hour sessions for practices. The frequency of office-hour sessions varied over time and by region.	• Answered practice questions on CPC requirements and Milestones
Leadership track meetings (2013–2016)	RLF hosted quarterly web-based or in-person meetings with clinician leaders and health system administrators.	• Enhanced networking across practices • Delivered training customized for clinicians and health system leadership

Table 3.8 *(continued)*

Learning activity (years offered)	**Description**	**Purpose**
Care manager meetings (2015–2016)	RLF hosted in-person or virtual meetings for care managers and other practice staff. Meetings were held in all regions but New Jersey. The timing and frequency varied across regions.	• Provided trainings on care management tools and processes • Facilitated peer-to-peer learning and support on common issues care managers face • Shared information on how practices can better leverage their care managers
Individualized practice coaching (2013–2016)	RLF provided individualized assistance to practices one-on-one or in small groups as needed. RLF reached out to a subset of practices to provide individualized practice coaching. RLF's approaches to identifying practice needs and the percentage of practices receiving this proactive support varied across regions. Practices could also reach out to their RLF with questions.	• Provided struggling practices with tailored learning support on Milestones • Helped practices meet administrative requirements

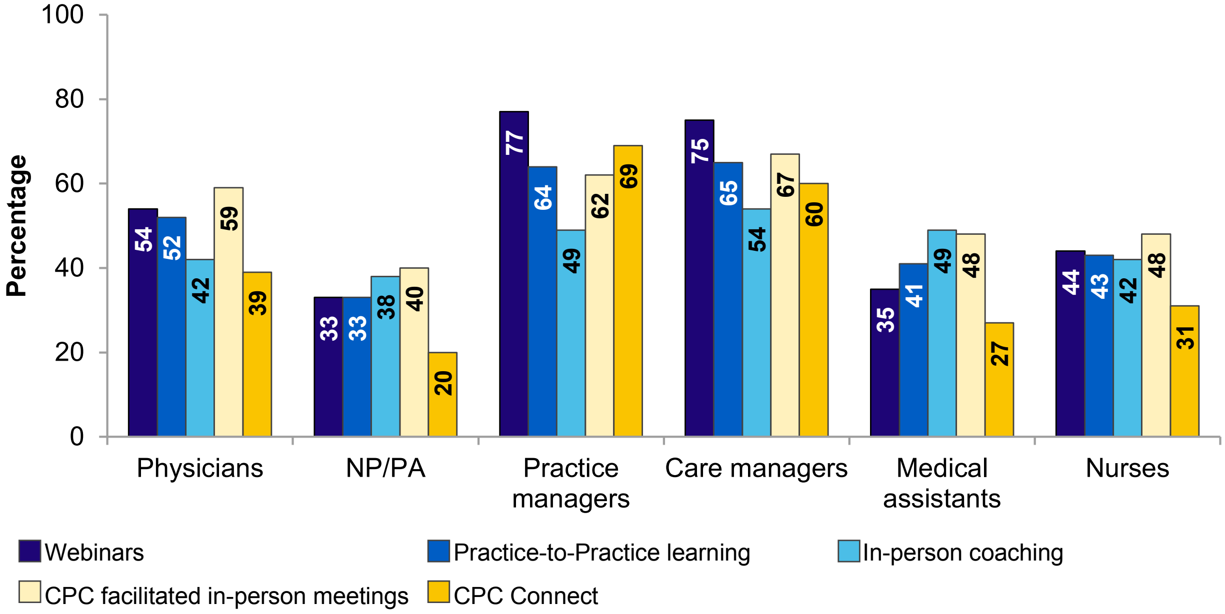
Source: TMF Health Quality Institute's CPC Curriculum. Interviews with RLF and CMS staff conducted by Mathematica. Observations of group learning activities.

EHR = electronic health record; RLF = regional learning faculty.

Most practices actively participated in CPC learning activities. CMS requirements for practice participation evolved over the course of the initiative. Throughout CPC's four years, CMS required practices to send a representative to all regional in-person and virtual learning sessions. CMS gradually replaced requirements for practices to attend national and regional webinars with requirements to attend Milestone action groups, which in turn were replaced by rapid-cycle action groups. Finally, in the last two years of the initiative, CMS also required practices to allow RLF to monitor and support the practice's progress toward meeting Milestone requirements. Based on RLF assessments, most CPC practices met the CPC requirements for participating in national and regional learning activities (Milestone 8).

Analysis of the CPC clinician and staff surveys from 2016 indicated that, among members of CPC practices, practice managers and care managers were most likely to report having participated in CPC learning activities, followed by physicians and then by medical assistants and nurses (Figure 3.9). Nurse practitioners and physician assistants were least likely to have reported participating.

Figure 3.9. Percentage of CPC clinicians and staff receiving various types of CPC assistance during the past six months, 2016



Source: CPC clinician and staff survey, administered June through November 2016.

a. Details on CPC's group learning activities

Over the four years of the initiative, CMS and its contractors continually refined CPC group learning activities to help practices achieve the goals of CPC. In the first year of the initiative, all-day learning sessions and webinars played a prominent role in learning activities, and were used to efficiently share broadly relevant information on the initiative and specific Milestones with all practices in CPC or in each region. CMS and RLF in most regions also hosted office hours to directly engage with practices.

Feedback in the first year from practices and RLF revealed several common critiques of the group learning activities, including (1) a lack of specific, concrete directions for implementation; (2) limited to no tailoring of information for specific practice needs (viewed as important given the heterogeneity of CPC practices); (3) webinars that were not always timely enough to help practices complete required tasks; and (4) multiple webinars and all-day learning sessions repeating the same Milestone topics.

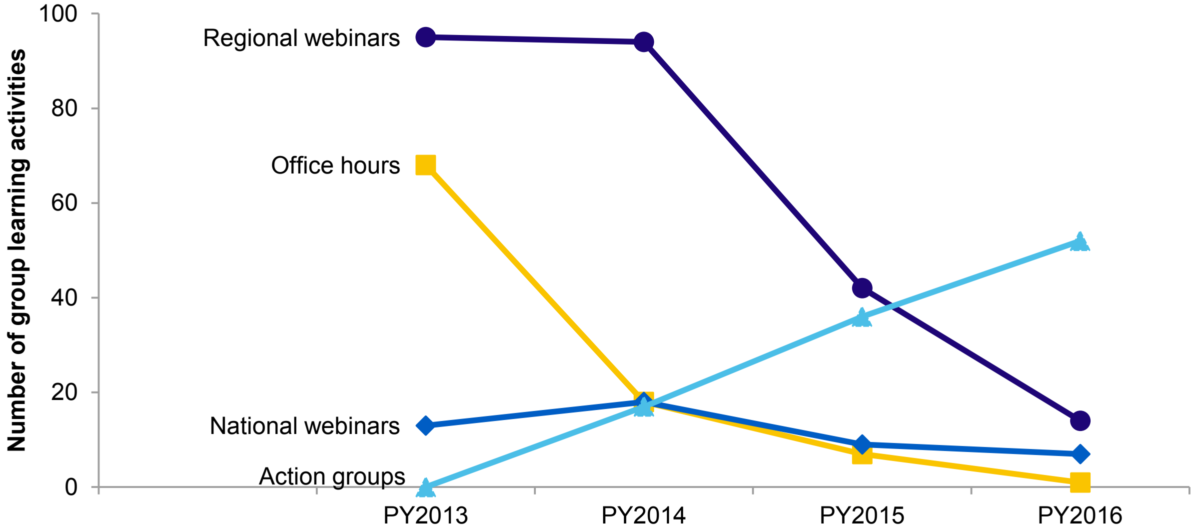
In response to this feedback, and in recognition of practices' growing expertise on Milestone topics, CMS, TMF, and RLF made changes to group learning activities after CPC's first program year. CMS and its contractors:

- Made all-day learning sessions and webinars less didactic and more interactive by increasing panel discussions (for example, with practices, patients, and payers) and opportunities for peer-to-peer learning (including breakout groups of practices focusing on a particular topic).

For example, in PY2016, RLF in Oregon recruited practices to lead sessions that were of strong interest to other practices, such as strategies for reducing 30-day readmissions.

- Reduced the number of webinars and office hours held nationally and in each region (Figure 3.10).
- Introduced new cross-regional learning communities aimed at providing practices the opportunity to learn from other practices located in different regions but with similar characteristics (such as practice size and ownership status). Specifically, CMS introduced:
    - Action groups, which were organized around Milestone topics, such as medication management and shared decision making. TMF or RLF hosted periodic web-based meetings with practices participating in the groups and, between those calls, encouraged practices to implement small tests of change in the given Milestone area. (Appendix C, Figure C.2 indicates the percentage of practices that attended each action group.)
    - EHR affinity groups, which provided a problem-solving forum for practices that used the same EHR. EHR affinity groups were organized for the EHRs most commonly used by CPC practices, such as EPIC, NextGen, Allscripts, and eClinicalworks. EHR vendors were encouraged to join these meetings to answer questions and offer suggestions. However, vendors participated infrequently.

Figure 3.10. Number and format of CPC group learning activities, PY2013 through PY2016



Source: TMF Health Quality Institute’s CPC Curricula for 2013, 2014, 2015, 2016.

Note: Action groups include both Milestone and rapid-cycle action groups. The transition from Milestone action groups to rapid-cycle action groups occurred in 2015.

To support continued peer-to-peer learning between group learning activities, CMS and its contractors launched a CPC online knowledge management and collaboration tool, the CPC collaboration site, in the first year of the initiative. However, practices and RLF encountered many issues trying to use the site—in particular, challenges finding relevant discussion forums and resources. Their feedback led CMS first to make changes to the collaboration site to improve its usability, and then to replace it with CPC Connect in September 2015. CPC Connect used a new electronic platform modeled after social media sites. Each user had a profile from which they could share comments or questions with all users or with particular user groups.

Most RLF expressed strong support for the initiative's transition away from didactic presentations in favor of focusing on peer-to-peer learning during in-person learning sessions, webinars, and action groups. Additionally, some RLF indicated that action groups helped to differentiate and tailor learning by allowing practices to connect with others facing similar challenges. RLF also applauded the interactive aspects of rapid-cycle action groups, and noted that practices benefited most from learning activities when they provided takeaways that were tailored to CPC practices of various sizes, types, and levels of sophistication.

> "The group activities have changed a lot. At our learning collaboratives, practices at the beginning of the day get up to the mic and they share something that they have worked on over the last quarter, and this [session] has become a favorite…of the practices. They really enjoy…hearing from each other and learning from each other."

However, over the last two years of the initiative, some RLF remarked on the challenge of identifying practices to serve as panelists during group learning activities. According to these RLF, the same handful of practices kept being asked to present at group learning sessions, creating a burden for those practices and "an unsustainable situation for the learning curriculum." One RLF suggested that this problem could be addressed by adopting a better balance between peer-to-peer learning and presentations by subject-matter experts. Faculty in two regions echoed this need, noting the desire of some practices to learn directly from experts and faculty on particular topics.

b. Details on CPC individualized practice coaching

In addition to providing group learning activities, in each program year, RLF used a portion of their limited resources for CPC learning activities to provide one-on-one coaching to some practices. Individualized practice coaching could include, for example, making an in-person visit to a practice to discuss workflows or a telephone call with a practice care manager on risk stratification. During interviews and on the CPC practice survey, RLF and practices reported that practices receiving in-person coaching valued it more than group learning activities. However, due to the high cost of providing that level of support, RLF had to prioritize where to focus their resources. RLF in each region assessed practices' progress toward required CPC Milestones and achieving CPC's goals more broadly, and generally used more resources to assist practices experiencing the greatest challenges. At the outset of CPC, RLF primarily used their own judgment to risk stratify practices. As the initiative progressed, RLF increasingly relied on practices' quarterly Milestone submissions and, in some cases, Medicare FFS data feedback reports.

Across regions, RLF varied widely in how they approached individual practice coaching, with some offering more frequent coaching opportunities than others (Table 3.9). In establishing their approach to practice coaching, RLF considered characteristics of the practices in their region (for example, average practice size and degree of system affiliation) and regional context (for example, rural/urban mix and health IT infrastructure). One RLF operating in a statewide region distributed staff throughout the region to facilitate in-person visits to nearby practices. To expand their capacity to provide in-person practice coaching, some RLF also supplemented CMS's CPC funding with external funding or staff resources from other CPC payers or other initiatives.

Throughout the initiative and across regions, RLF provided more in-person visits to practices that they perceived to be at the highest risk of not fulfilling Milestone requirements (Table 3.9). In most regions, RLF also regularly communicated with moderate risk practices either through in-person visits or over the phone. Also in most regions, practices that RLF identified as likely to complete all Milestone requirements received periodic telephone or email check-ins; Colorado and Oklahoma were the only regions in which such practices received regular in-person visits. Although RLF from these regions prioritized individualized support for struggling practices, they noted that progress in even high-performing practices could be stalled or reversed by developments such as staff turnover or practice ownership changes, and that frequent, face-to-face contact allowed RLF to identify and address performance issues before they became serious. Corresponding with the variety of approaches used by RLF, the percentage of practices that reported on the 2016 CPC practice survey that they had received in-person coaching at their practice site in the prior six months ranged from 13 percent in Ohio/Kentucky to 89 percent in Oklahoma (Table 3.9)

Table 3.9. Planned frequency and mode of individualized practice coaching and the percentage of practices that reported receiving coaching at their practice site, by region, PY2016

	Planned frequency and mode of individualized practice coaching, by RLF perceived risk of practices not achieving CPC aims			Percentage of practices that reported receiving coaching at their practice site in the prior six months
	High risk	Moderate risk	Low risk	
AR	At least monthly calls or in-person visits	Monthly email check-in; at least monthly calls; occasional in-person visits	Monthly email check-in; at least monthly calls; occasional in-person visits	77
CO[a]	HTW: At least monthly in-person visits; calls as needed RMHP: Twice monthly in-person visits	HTW: Monthly to quarterly in-person visits; calls as needed RMHP: Twice monthly in-person visits	HTW: Quarterly in-person visits; calls if identified as needed by RLF RMHP: Twice monthly in-person visits	74
NJ	Weekly, biweekly, or monthly calls; in-person visits at least quarterly	Monthly or quarterly calls; occasional in-person visits	Quarterly calls	69
NY	Frequent calls; in-person visits if identified as needed by RLF	Calls if identified as needed by RLF	Calls if identified as needed by RLF	36
OH/KY	Calls or in-person visits if identified as needed by RLF	Calls or in-person visits if identified as needed by RLF	Calls or in-person visits if identified as needed by RLF	13
OK	Frequent in-person visits and calls	Monthly in-person visits	Monthly in-person visits	89
OR	Monthly in-person visits	Quarterly in-person visits or calls	Calls if identified as needed by RLF	45

Sources: Interviews with RLF conducted by Mathematica in 2016. CPC practice survey, administered April through August 2016.

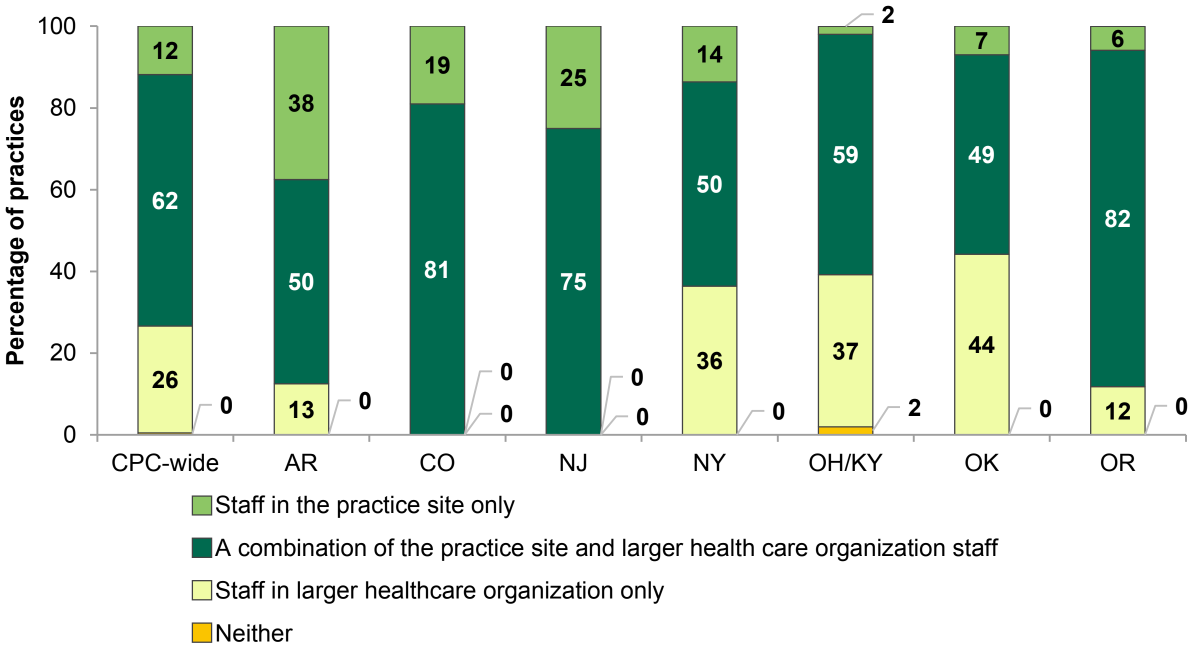
Notes: Some RLF interactions with practices may reflect interactions with only system-level staff.

[a] HTW = HealthTeamWorks (served Front Range region, which covered approximately 80 percent of Colorado practices); RMHP = Rocky Mountain Health Plans (served Western Slope region, which included approximately 20 percent of Colorado practices).

RLF = regional learning faculty.

On the 2016 CPC practice survey, among practices that were owned by a larger health care organization, 74 percent reported that RLF communicated with their practice's staff, or with a combination of practice- and systems-level staff. CMS intended for CPC to be a practice-level (not system-level) intervention (Figure 3.11). However, the remaining one-quarter of practices reported that RLF communicated only with systems-level staff. The percentage reporting that *only* system-level staff communicated with RLF varied considerably by region, from 0 percent in Colorado and New Jersey to 36 to 44 percent in New York, Ohio/Kentucky, and Oklahoma.

Figure 3.11. Percentage of system-owned practices reporting staff in the practice site or their larger health care organization communicate with RLF, in 2016



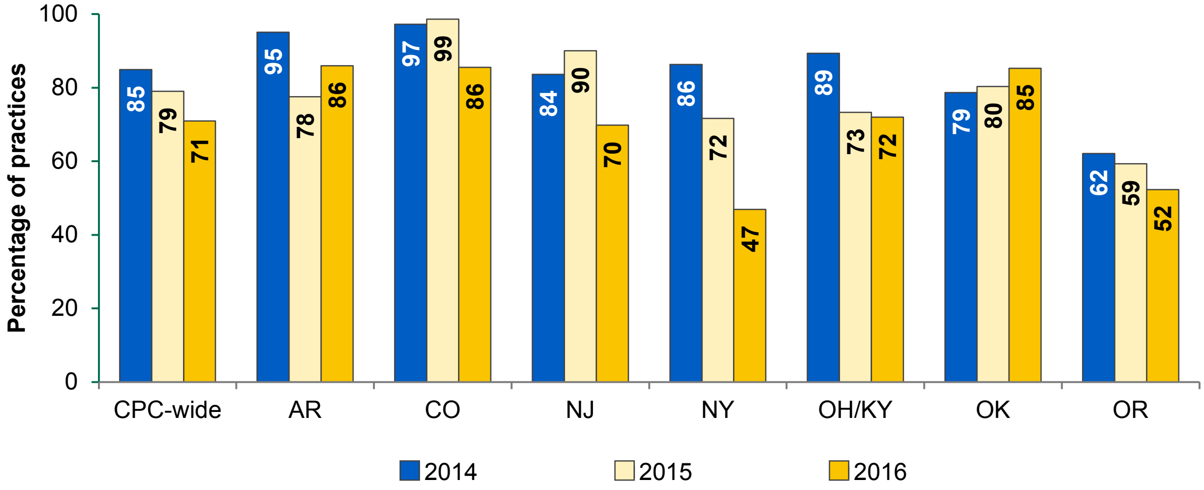
Source: CPC practice survey, administered April through August 2016.

Note: Practices owned by a larger health care organization include practices where the clinicians are employed by, or the practice is owned by a group or staff model HMO, hospital, hospital system, or medical school. Some columns do not add up to 100 percent due to rounding.

RLF = regional learning faculty.

Practices reported less frequent communication with the RLF over the course of CPC. Across regions, the percentage of practices reporting at least monthly contact with their RLF decreased from 85 percent of practices in PY2014 to 71 percent in PY2016. These decreases corresponded with some RLF deciding to reduce the frequency and intensity of individualized coaching as practices became more comfortable with the initiative. As RLF in one region noted, "Some of these practices have matured to a point that it may be that we can [now] space our interactions differently, or at least [space] our face-to-face interactions differently." The percentage of practices reporting at least monthly contact also varied by region, with Colorado practices consistently reporting the highest frequency of interaction with their RLF, and Oregon practices reporting the lowest (Figure 3.12; Appendix C provides additional detail on the frequency of RLF interactions with practices and practices' ratings of RLF by region).

Figure 3.12. Percentage of practices reporting interacting with their RLF at least once a month, PY2014–PY2016, CPC-wide and by region



Source: CPC practice survey, administered April through July 2014, April through August 2015, and April through August 2016.

On the CPC practice survey, 28 percent of practices that reported communicating with the RLF indicated that direct support from the RLF focused on helping them make practice improvements including meeting CPC Milestones; 22 percent of the practices reported receiving substantial help on Milestones as well administrative requirements, and 44 percent of the practices reported that they received help from the RLF primarily to meet administrative requirements. Only 6 percent of practices reported little or no help from the RLF with practice improvement or administrative requirements.

During interviews, RLF reported that Milestone-focused practice coaching often centered on risk stratification and care management, shared decision making, and using data to guide improvement. For example, practices frequently received coaching on implementing their advanced primary care strategies (patient self-management support, behavioral health integration, or comprehensive medication management), selecting an appropriate shared decision making aid, and reporting eCQMs. Some deep-dive practices indicated that RLF review of plans for Milestone-related changes in practice processes (such as a new shared decision making tool) and help with finding new resources (such as care compact templates) were particularly valuable coaching activities.

RLF reported during interviews with Mathematica that, starting in PY2015, practice coaching increasingly emphasized the use of data. In several regions, RLF reported helping practices use eCQMs to help support quality improvement. For example, in one region, practices submitted their eCQMs to the RLF quarterly (in addition to their annual reporting to CMS). The RLF helped the practices chart their performance on the measures and identify strategies to improve. Similarly, in many regions, the RLF reported using Medicare feedback reports to help practices' target their quality improvement work. RLF in several regions, including Arkansas and Oklahoma, supported this coaching by repackaging the practice-level data from quarterly Medicare feedback reports into new reports to make these data more actionable. For example, for system practices, Oklahoma RLF used Medicare feedback reports to produce reports displaying performance on key metrics of all CPC practices in the same system. As another example, in several regions where practices agreed to share unblinded practice-level Medicare data with one another—Arkansas, Ohio/Kentucky, and Oklahoma—faculty began using them to provide more targeted peer-to-peer learning (for example, by trying to connect advanced and struggling practices in specific performance areas). However, one RLF cited the time burden on advanced practices as a key barrier to implementing this approach on a widespread basis.

3.5.2. Learning support from other payers

Non-Medicare payers also provided coaching or assistance to 71 percent of CPC practices in the six months prior to them responding to the 2016 CPC practice survey. The level and type of support varied widely across payers.

While all payers agreed to provide practices with enhanced payments and data feedback in their CPC memoranda of understanding with CMS, they did not commit to providing CPC practices with learning support (CMS 2013b). Nonetheless, most payers participated in CMS-funded CPC learning activities or provided practices learning activities through other initiatives.

Payers in Oklahoma were most involved in CPC learning activities, followed by payers in Arkansas and Colorado. In Oklahoma, non-CPC payers were initially concerned that CPC practices were not receiving enough individualized support, so they developed a field service team to provide CPC practices additional support. Each Oklahoma payer provided a "point of contact" who, supported by the RLF, provided individualized practice coaching to CPC practices. (Partly as a result of the field service team, as noted above, Oklahoma practices reported receiving more in-person coaching than practices in other regions.) The field service team also worked together to develop agendas for group learning activities. As another example of payer engagement in learning, in fall 2015, Arkansas payers and RLF started to meet monthly as a regional learning team to discuss initiative activities and practices' challenges in meeting CPC Milestones. In 2015 and 2016, Colorado payers, RLF, and the data aggregation vendor collaborated to provide in-person training on the region's data aggregation tool.

In addition, payers in most regions attended and presented at all-day learning sessions organized by CMS and its contractors. Examples of payer presentations included overcoming challenges in communicating with specialists and steering referral and ordering patterns toward lower cost specialty and ancillary providers. In some regions, including Arkansas and New York, payers and stakeholders highlighted the value of these meetings for facilitating communication between payers and practices on topics ranging from how to use payer feedback reports to common challenges faced by practices. Multistakeholder faculty in one region noted, "[When] the payers and the practices are actually in the same room, grappling with the same thing…the practices can see that

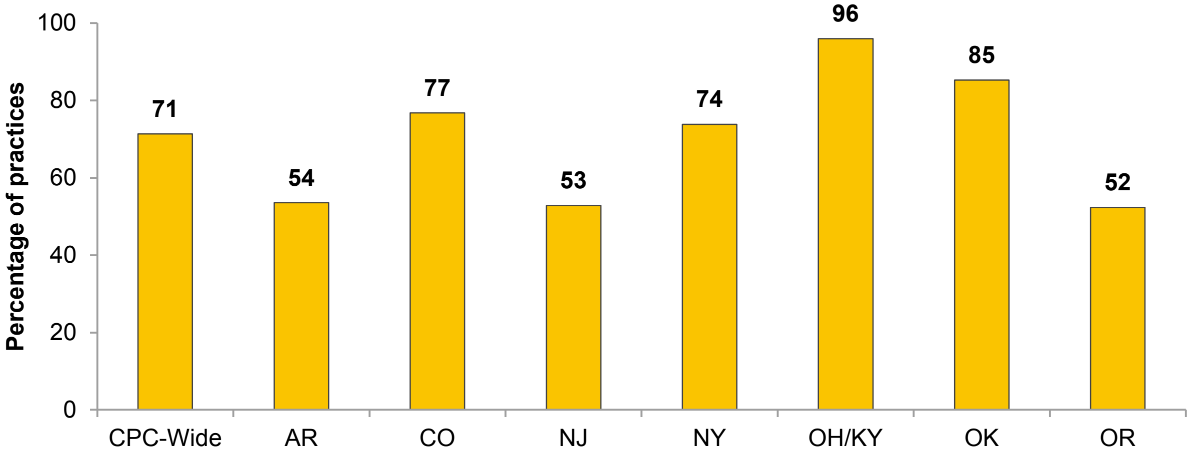
> "[When] the payers and the practices are actually in the same room, grappling with the same thing…the practices can see that the payers aren't just big bad guys that want to take away their money, and the payers can see, 'Oh, these people aren't just out to get every penny that they can.'"

the payers aren't just big bad guys that want to take away their money, and the payers can see, 'Oh, these people aren't just out to get every penny that they can.'"

Throughout the initiative, a number of participating payers also provided their own support to practices. This support was not coordinated with the RLF but rather augmented RLF's efforts. Most often, payers provided technical assistance on how practices could use their own payer feedback reports to guide quality improvement. Their approaches varied, with some meeting regularly with practices to discuss the reports and others fielding questions from practices on an ad hoc basis. Also common, several payers staffed their own care management or disease management teams that provided support to practices' commercially insured patients. The few deep-dive practices selected for intensive study that had a care manager from a commercial plan on-site reported that this arrangement allowed them to use their own care manager to focus on their other high-risk patients. A few payers also offered more extensive practice support. For example, one New Jersey payer reported offering coaching to all CPC practices (as well as other practices that participated in their value-based payment programs) to support practice transformation and quality improvement, and one Oregon payer provided all-day, in-person trainings on motivational interviewing to practices within its network.

In the PY2016 CPC practice survey, 71 percent of practices CPC-wide reported receiving coaching or assistance from non-Medicare payers in the prior six months. The percentage of practices that reported receiving this assistance varied considerably by region (Figure 3.13), with practices in Ohio/Kentucky (96 percent) and Oklahoma (85 percent) most likely to report receiving this support.

Figure 3.13. Percentage of practices reporting they received coaching or assistance from non-Medicare payers in the past six months, CPC-wide and by region, PY2016



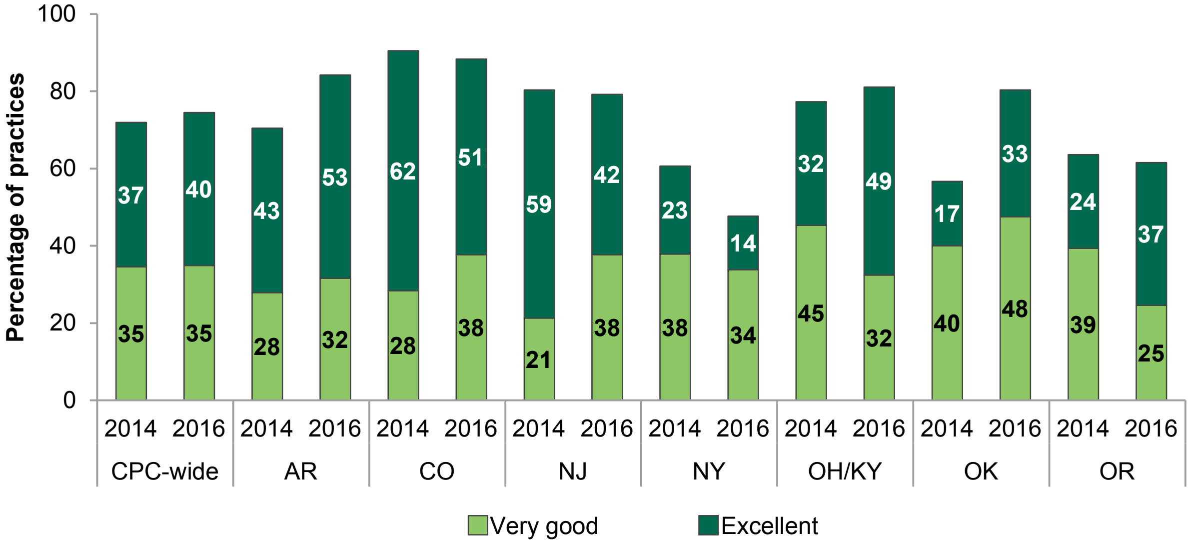
Source: CPC practice survey, administered April through August 2016.

3.5.3. Practices' use of and perspectives on CPC learning support

Practices were generally satisfied with CPC learning support. In particular, practices found in-person learning activities and opportunities for peer-to-peer learning to be the most valuable learning support.

In general, practices were satisfied with the learning support they received from CMS and its contractors. In 2016, 75 percent of practices CPC-wide rated their RLF as excellent (40 percent) or very good (35 percent) in meeting their CPC-related needs. The proportion of practices rating their RLF as excellent, however, varied across regions and over time (Figure 3.14). Most notably, RLF in Colorado consistently received some of the highest ratings, whereas RLF in New York generally received some of the lowest ratings, though ratings were still fairly high.

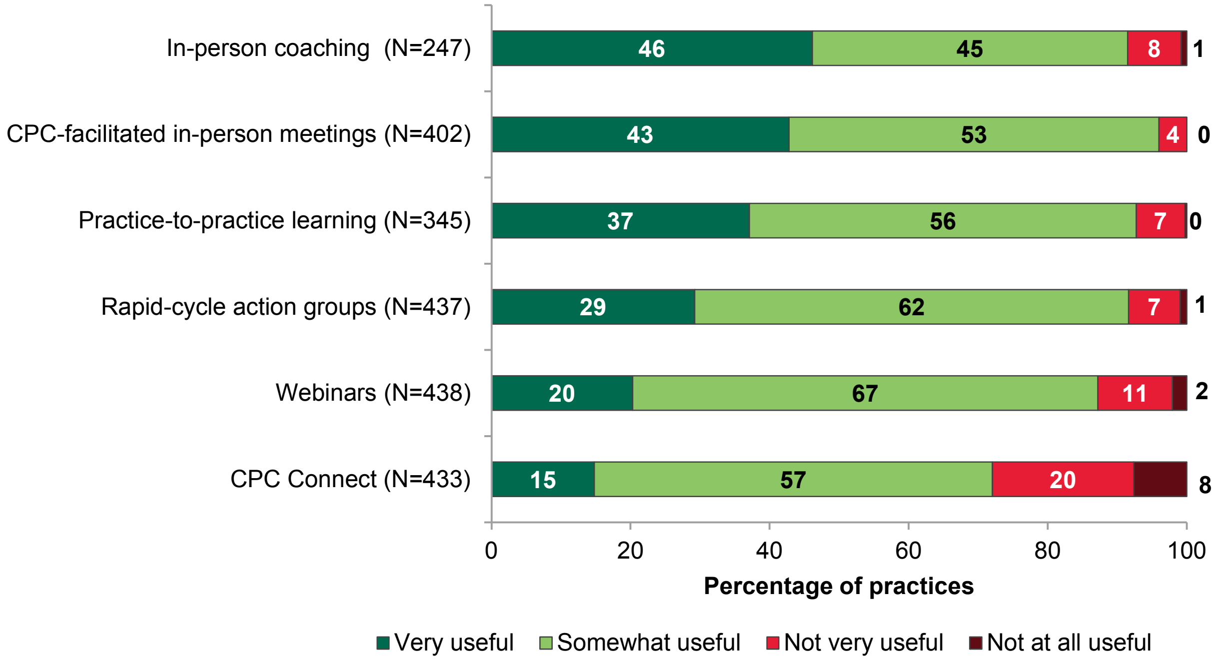
Figure 3.14. Percentage of CPC practices rating their RLF as excellent or very good in meeting their CPC-related needs, in PY2014 and PY2016, by region



Source: CPC practice survey, administered April through July 2014 and April through August 2016.

The 2016 CPC practice survey asked practices that participated in a learning activity to indicate how useful it was to their practice (Figure 3.15). Practices found in-person coaching and in-person all-day meetings, followed by practice-to-practice learning and rapid-cycle action groups, to be most helpful, with practices more likely to rate these supports as very useful compared with webinars or CPC Connect. (Practice-to-practice learning was not a separate learning activity but a component of several activities, including in-person meetings and rapid-cycle action groups.) Findings from the CPC clinician and staff survey, which asked physicians, NPs/PAs, care managers, medical assistants, and nurses that participated in a learning activity to rate its usefulness, further confirmed this finding. Across respondent types, CPC clinicians and staff were most likely to rate in-person coaching, in-person meetings, and then practice-to-practice learning as very useful.

Figure 3.15. Reports of how useful various types of CPC assistance were to CPC practices, among those that received the assistance, 2016



Source: CPC practice survey, administered April through August 2016.

Notes: Practice-to-practice learning was not a separate learning activity but a component of several activities including in-person meetings and rapid-cycle action groups. The number of practices that reported receiving various activities ranged from 247 that reported receiving in-person coaching to 438 that reported attending webinars. For rapid-cycle action groups, we averaged ratings across the eight rapid-cycle action groups offered to CPC practices. The findings represent a weighted average of practices' ratings, weighted by the number of practices that reported attending the rapid-cycle action group and gave a rating of usefulness. The percentage of practices CPC-wide that reported attending the rapid-cycle action groups ranged from 27 percent for "From screening to treatment in behavioral health" to 47 percent for "Leveraging your whole team to improve chronic disease management."

In line with our survey findings, deep-dive practices selected for in-depth qualitative study reported that they found in-person learning sessions and opportunities for peer-to-peer learning to be most valuable. Deep-dive practices also provided a more nuanced view of learning. Specifically, deep-dive practices reported that they valued learning activities that:

- Provided interactive learning opportunities. Practices indicated that sharing real-life challenges, successes, and lessons learned with peers helped generate ideas to test in their own practices. For instance, one deep-dive practice reported getting the idea from another practice at a learning collaborative meeting to put tablets in exam rooms so patients could update their medication lists while waiting to be seen. Practices also reported that opportunities to interact in-person with other practices boosted morale and facilitated camaraderie among practices' care managers.
- Offered opportunities, such as breakout sessions at in-person learning meetings, for practices to speak in depth about a specific topic or with people in similar roles. For example, one care manager reported that, during a breakout session at a CPC all-day meeting, RLF walked

practices through how to interpret and use Medicare FFS feedback reports. The care manager reported walking away from that meeting with a concrete understanding of how to use her practice's feedback reports moving forward.

- Focused on topics and resources that could easily be applied to day-to-day work. As one care manager explained, "RLF come in and give us ideas. They are giving us information and tools that we can use to help our patients. If we need a tool or resource, we can call them and find the answer."

Deep-dive practices also identified several challenges to learning support that persisted over the course of the four-year initiative:

- The time required to attend in-person learning sessions, which meant being out of the office and unavailable for patient care, was burdensome for practices. In particular, rural practices, whose staff had to travel long distances to attend in-person learning sessions, reported this challenge.
- Some learning activities—in particular, webinars—were less useful, because they provided general information that was not tailored to meet different practice needs.
- Some practices were frustrated that they were required to attend multiple group learning sessions covering the same Milestone topics.
- The time required to find resources on the CPC collaboration site and, to a lesser extent, its successor CPC Connect limited the use of those sites.
- Lack of EHR vendor participation in EHR affinity groups limited practices' ability to resolve EHR-related issues. Frustration with this challenge resulted in waning practice participation in these groups over time.

4. HOW DID CPC PAYERS, PRACTICES, AND OTHER STAKEHOLDERS WORK TOGETHER?

CPC represents one of the largest and most substantial multipayer initiatives ever tested. For the initiative, CMS, state Medicaid agencies and associated Medicaid Managed Care Organizations, and private payers committed to providing practices enhanced payment to promote comprehensive primary care. Payers also agreed to work together to develop an approach to align and coordinate data feedback for participating practices. This work required a tremendous amount of coordination and collaboration among participating stakeholders.

In this chapter, we describe how CPC payers in each region collaborated with one another, as well as with CMS and other stakeholders. We first describe the goals of CPC collaboration and how collaborative efforts were structured. We then highlight the outcomes from those collaborative efforts. Finally, we describe the barriers and facilitators that non-Medicare payers faced collaborating with each other and with CMS.

4.1. Key takeaways on collaboration among CPC payers and other stakeholders

- Most payers remained committed to CPC and actively engaged in collaborative discussions for the duration of the initiative. However, a few payers that had a low number of attributed patients in CPC or were actively participating in concurrent initiatives showed lower levels of engagement.
- Payers generally reported that they established productive, positive working relationships with other payers in their region. Payers indicated that prior experience working together, strong multistakeholder facilitation, leadership from payer champions, and meaningful engagement with practices facilitated collaboration.
- Most payers viewed CMS as a critical partner in efforts to transform primary care, recognizing its role in encouraging practice participation in transformation efforts and bringing additional financial and technical support to each region. However, CMS's dual role as initiative convener and participating payer at times made collaboration challenging. CMS was able to build trust with other payers by clarifying which parts of CPC could be adapted to regional contexts, deferring to other payers for these decisions, increasing opportunities for payers to meet with CMS representatives, and committing to build on the successes and lessons of CPC in CPC+.
- Most payers valued the opportunity to discuss CPC with practices, and hear more directly about the challenges and successes that practices experienced in implementing comprehensive primary care. However, in several regions, payers reported that active, sustained practice engagement in multistakeholder meetings was difficult to attain.
- Payers indicated that multistakeholder meetings—which involved payers, practices, and, in some regions, patients or other stakeholder groups that did not participate in CPC—could have been improved by delineating clear goals for engagement, selecting stakeholders with the time and skills needed to contribute to discussions, and building trust among payers and other stakeholders.

- By bringing together payers and other stakeholders, CPC enabled payers to accomplish several collaborative outcomes, including aligning quality goals and financial incentives, agreeing on a common set of quality measures, coordinating common approaches to data feedback, and coordinating CPC with other regional efforts.

4.2. Methods

For this chapter, we analyzed data from interviews with CMS, other participating payers, and multistakeholder faculty (organizations CMS contracted with to convene meetings of payers, practices, and other stakeholders). We also drew on our notes from our observations of multipayer and multistakeholder meetings to inform our analysis.

4.3. CPC collaborative goals and structure

CMS and most other payers remained committed to working together to improve supports for CPC practices and actively engaged in collaborative discussions for the duration of the initiative.

In each of the seven regions, CPC brought together payers who agreed to align their goals and financial incentives to drive primary care practice transformation. Over the course of CPC, CMS and other payers worked together to accomplish several collaborative outcomes. During the initiative's first year, payers focused on aligning the quality metrics they used for determining practices' eligibility to participate in shared savings, selecting a common approach to providing data feedback to practices, and developing an approach to collaborate with CPC practices and other stakeholders, such as consumer representatives, employers, hospital associations, or health foundations. As the initiative evolved, payers focused increasing attention on implementing the region's selected approach to data feedback and developing plans to sustain support to practices after the end of CPC. In some regions, payers also worked together on other areas, such as coordinating learning activities and supports between CPC's learning faculty and participating payers, improving health literacy and patient education, increasing information sharing between hospitals and CPC practices to support transitional care, aligning their messaging on shared savings approaches, or encouraging additional self-insured clients to sign on to the CPC initiative.

CMS and other payers met regularly to discuss collaborative priorities. The initial frequency of these payer-only (or multipayer) meetings varied from weekly in Arkansas to every two months in New Jersey. In each region, these meetings were facilitated by regional conveners (referred to as "multistakeholder faculty") that were funded by CMS. When possible, CMS and its learning contractor selected experienced, neutral regional organizations for this role. In regions where an appropriate local organization was not identified, the Center for Evidence-Based Policy at the Oregon Health and Science University served as the multistakeholder faculty.

Over the course of the initiative, payers in most regions formed work groups to accelerate progress in one or more of the following priority areas: data sharing (Arkansas, Colorado, Ohio/Kentucky, Oklahoma, and Oregon), employer engagement (Ohio/Kentucky), and learning support (Oklahoma). Work group meeting frequency varied, with groups meeting more frequently during periods of intense activity (for example, when the region was designing reporting templates or reviewing applications for data aggregation vendors).

From the start of the initiative, CMS encouraged payers to engage practices and other stakeholders in their collaborative work and, by PY2015, multistakeholder meetings were the most common forum for discussing CPC (Table 4.1; Table 4.2). In all regions, payers engaged a subset of CPC practice managers and clinicians in their collaborative discussions. In some regions, payers also included consumers, employers, or other stakeholders—such as hospital associations or health foundations—in meetings.

Table 4.1. CPC multistakeholder meeting participants

Region	Month other stakeholders joined CPC meetings	Stakeholders joining CPC meetings			
		CPC practices[a]	Consumers[b]	Employers	Other stakeholders[c]
AR	November 2012	X	X	X	X
CO	May 2014	X			.
NJ	September 2014	X			X
NY	January 2013	X	X		X
OH/KY	October 2012	X	X	X	
OK	February 2014	X	X	X	
OR	May 2014	X			

Source: Agendas and notes from payer and multistakeholder meetings and information provided by multistakeholder faculty and CMS staff.

[a] CPC practice representatives included health system executives, clinicians, care coordinators, and office managers.

[b] Consumers included patient representatives and consumer advocacy groups.

[c] Other stakeholders included Medicaid (not a participating payer) in New York; hospital associations in New Jersey; and the Department of Health, health foundations, universities, and pharmacists in Arkansas.

Table 4.2. Frequency of CPC payer-only and multistakeholder meetings

	At start of CPC (PY2013)	Last year of CPC (PY2016)	
	Payer-only meetings[a]	Payer-only meetings[a]	Multistakeholder meetings[b]
AR	Weekly	Every two weeks	Quarterly
CO	Monthly	Monthly	Quarterly
NJ	Every two months	None	Quarterly
NY	Every two weeks	None	Quarterly
OH/KY	Every three weeks	None	Quarterly
OK	Every two weeks	As needed	Quarterly
OR	Monthly	Monthly[c]	Quarterly

Source: Agendas and notes from payer and multistakeholder meetings and information provided by multistakeholder faculty and CMS staff.

[a] Payer-only meetings, commonly referred to as multipayer meetings in CPC, included only payers participating in CPC.

[b] Multistakeholder meetings included payers participating in CPC and other stakeholders.

[c] Oregon payers started meeting monthly after CMS announced CPC+ in April 2016; payers met as needed from September 2014 through March 2016.

Payers in Arkansas, New York, and Ohio/Kentucky were quick to start working with stakeholders and held their first multistakeholder meetings within three months of the initiative's start. Payers in the remaining four regions expressed reservations about engaging other stakeholders in their collaborative discussions. Their main concerns included overburdening providers, duplicating existing multistakeholder efforts, and identifying the "right" participants (that is, those interested in ongoing participation and capable of making meaningful contributions to meetings).

CMS initially funded multistakeholder faculty to facilitate both payer-only meetings and multistakeholder meetings. In September 2014, after all regions had established multistakeholder meetings, CMS transitioned to funding only multistakeholder group facilitation. Following this transition, payers in four regions continued to supplement multistakeholder meetings with regular or ad hoc payer-only meetings to discuss CPC issues that interested only payers or that were sensitive or not appropriate for the multistakeholder forum. For example, in Arkansas, after practices indicated that patient-level data would be useful in their transformation efforts during multistakeholder meetings, payers used payer-only meetings to finalize a plan for providing that information to practices. Due to resource limitations, CMS did not commit to regularly attending payer-only meetings, though typically would attend if requested.

4.4. Results of CPC collaboration

CPC payers aligned quality goals and financial incentives, agreed on a common set of quality measures, and, in some regions, coordinated common approaches to data feedback and coordinated CPC with other regional efforts.

CMS and other payers accomplished a number of collaborative outcomes during CPC (Table 4.3). In each region, payers agreed on a common set of quality measures; however, only about half of payers ultimately used these measures to determine practices' eligibility to participate in shared savings. In five regions, payers developed a common approach to data feedback. Specifically, by PY2015, two regions were providing practices with aligned individual reports (covering a common set of cost and service use measures in individual reports), while three regions had achieved data aggregation (producing a single report that aggregates data across payers). Although not an explicit CPC goal, payers in Oklahoma also collaborated with the CMS-funded learning contractor to provide coordinated, individualized technical assistance to CPC practices. (See Chapter 3.4.1.b for additional information on payers' aligned and aggregated reports and Chapter 3.5.2 for additional detail on aligned technical assistance.)

Table 4.3. Selected CPC collaborative outcomes, by region

	Aligned goals and financial incentives[a]	Aligned quality measures[b]	Coordinated approach to data feedback		Coordinated technical assistance[c]	Coordinated plan for aligning CPC with SIM[e]
			Aligned individual reports	Data aggregation		
AR	X	X	X			X
CO	X	X		X		X
NJ	X	X				
NY	X	X				X
OH/KY	X	X		X		X
OK	X	X		X	X	X
OR[d]	X	X	X			
Total number of regions	**7**	**7**	**2**	**3**	**1**	**5**

Source: Agendas and notes from payer and multistakeholder meetings and information provided by multistakeholder faculty and CMS staff.

[a] CMS and other payer alignment of goals and financial incentives was a direct outcome of payers joining CPC, as opposed to an outcome from ongoing collaborative discussions.

[b] Payers agreed on a common set of quality measures; however, only around 50 percent of payers used them to determine practices' eligibility to participate in shared savings.

[c] Oklahoma was the only region in which participating payers collaborated with the CMS-funded learning contractor to provide coordinated, individualized technical assistance to CPC practices. Payers in other regions were involved in CPC learning in less intensive ways, such as participating in learning sessions for practices.

[d] Oregon moved forward with a common approach to data feedback; however, as of December 2015, two of the five payers had stopped participating in the effort.

[e] State Innovation Models (SIMs) were funded by CMS and led by the state's Medicaid program.

Moreover, payers in several regions worked together to coordinate CPC with other regional efforts. Most notably, payers in five regions viewed their states' State Innovation Model (SIM) awards, funded by CMS and led by the states, as an avenue to expand and sustain practice transformation started under CPC. In these regions, CPC payers and practices were actively engaged in SIM design and implementation decisions and based components of their SIMs on CPC.[45] As a result, a number of primary care practices that were not participating in CPC were encouraged to pursue milestones or aims in line with CPC goals and received payments, learning support, and data feedback similar to those of CPC practices. For example, Colorado payers worked to include data for patients attributed to SIM practices in the CPC data aggregation tool and planned to share unused licenses for the tool with SIM practices. As one multistakeholder faculty member described, "One of the things that has happened as a result [of CPC] is payers have been able to move from representing their organization to each other, to…representing the collaborative to the community…I think that [move] ultimately impacts the way they have approached their State Innovation Model and their commitment to [it]."

---

[45] SIM awards went into effect after CPC was already underway. Medicare FFS did not participate in states' SIM awardees and, thus, the level of funding to practices was, on average, substantially less than that provided by CPC.

In addition, payers in several regions advocated for CMS sustaining multipayer efforts to improve primary care support after the end of CPC. Specifically, in response to CMS's proposed rule on the expansion of CPC, payers in several regions submitted a unified response expressing their support for CMS sustaining CPC in some form (CMS 2015b). After CMS announced its plans for CPC+ in April 2016, payers in some CPC regions worked together to encourage additional payers to join CPC+ and/or developed a unified application for the initiative. For more information on CPC payers' participation in CPC+, see Chapter 2.3.

4.5. Factors influencing CPC collaboration

CMS built trust with other payers by clarifying which parts of CPC could be adapted to regional contexts, deferring to other payers for these decisions, and increasing opportunities for payers to meet with CMS representatives. Strong multistakeholder facilitation, leadership from payer champions, and meaningful engagement with practices facilitated collaboration among non-CMS payers.

In each CPC region, participating non-CMS payers collaborated with one another, as well as with CMS and other stakeholders. In this section, we describe how collaborative dynamics evolved and the factors that facilitated or hindered collaboration among these different groups (Anglin et al. 2017).

4.5.1. Collaboration among non-CMS payers

For the duration of the initiative, most participating payers remained committed to supporting advanced primary care through CPC and other initiatives. Capturing the sentiments of several payers, one payer noted, "This is how we do business. Not yesterday, not today—this is how we're going to do business.… [We're] in this for the long haul." In line with this commitment, most CPC payers remained engaged in CPC collaborative work. In general, payers expressed satisfaction with other payers' contributions to CPC, in terms of both intellectual contributions and financial resources for aligned supports (such as data aggregation). Moreover, most payers reported that they enjoyed the opportunity to learn from and work with other payers.

From interviews with payers and multistakeholder faculty and observations of payer-only and multistakeholder meetings, we identified several factors that influenced CPC collaboration among non-CMS payers. These factors, outlined below, fall into two categories: (1) factors that influenced *engagement in collaborative discussions* and (2) factors that influenced *relationships among non-CMS payers.*

The following factors influenced payers' engagement in collaborative discussions:

- **Size of payers' market share.** In most regions, payers with a larger market share participated more actively in CPC discussions than other payers and sometimes drove decision making. For the most part, other payers felt this dynamic was fair because the payers with larger market share had more "skin in the game" and smaller payers were willing to let them take the lead. However, in one region with a large, dominant player, this dynamic led several smaller payers to disengage from CPC collaborative discussions.

- **Differences between national and regional perspectives.** National payers and regional payers often contributed different perspectives in payer-only and multistakeholder meetings. Not surprisingly, regional payers were generally more knowledgeable about the region and more likely to be involved in non-CPC initiatives in the region than national payers. As a result, regional payers were often more invested in data aggregation and aligning CPC with other regional initiatives than national payers, though a few national payers also played an important role during those discussions. Other national payers, in contrast, were interested in standardizing their CPC approach across the regions. As a result, several national payers participating in multiple CPC regions opted out of regional data alignment efforts to maintain standardized reporting across regions within their own organizations. One multistakeholder faculty member described this dynamic: "As a collaborative, [payers] are hitting the point where their organizational interests are bumping up against the greater plan for the region.... That is a challenge that any collaborative faces."
- **Concurrent multipayer initiatives.** In most regions, CPC payers were involved in more than one multipayer initiative at the same time. When the goals and strategies of these initiatives were aligned, payers indicated that the alignment helped fuel CPC collaboration. For example, Oklahoma's multipayer health information exchange efforts helped payers move forward with data aggregation discussions for CPC. In contrast, differing priorities between CPC and other multipayer initiatives in Oregon contributed to payers' waning engagement in CPC. Over the course of the initiative, Oregon payers continued to report that they had positive working relationships but started to commit more time and resources to other efforts. However, CMS's announcement of the CPC+ initiative in April 2016 reinvigorated some Oregon payers' engagement in CPC.

The following factors influenced collaborative relationships among non-CMS payers:

- **Payers' prior working relationships.** At the outset of CPC, payers' prior experience working together set the tone for CPC discussions among non-CMS payers. In four regions, non-CMS payers had developed strong, positive relationships through prior collaborative efforts and reported that foundation provided them a leg up early in the initiative. For example, in one region, payers' previous work together to develop a state health information exchange served as a starting point for data aggregation discussions. In contrast, payers in other regions had less prior experience working together. In some cases, the lack of prior collaborative experience—combined with competitive market dynamics—resulted in distrust among payers, and early CPC discussions sometimes became heated. During the first year of CPC, however, payers in regions with little to no prior collaborative experience reportedly began to come together as a community, and by the end of the year, prior collaborative experience did not appear to be affecting payers' discussions.
- **Support from effective, proactive multistakeholder faculty.** In four regions, payers indicated their multistakeholder faculty was a critical factor in promoting CPC collaboration. In these regions, multistakeholder faculty served more than a logistical or administrative support role (for example, scheduling meetings and taking notes). Instead, effective multistakeholder faculty gained participants' trust; fostered positive working relationships among payers; broke down broad initiative goals into more concrete, achievable goals; and identified constructive steps to overcome barriers and make progress

toward those goals. For example, in one region, the multistakeholder faculty built group cohesion by (1) holding individual calls with payers to discuss issues that payers were reticent to raise in a group setting and then (2) identifying common points of interest and concern across payers and emphasizing them with the group. In another region, the multistakeholder faculty led the development of a formal charter that outlined the goals for payer collaboration and the responsibilities of payer partners.

- **Presence of payer champions.** In five regions, individuals emerged as group leaders that helped propel collaborative efforts; we refer to these individuals as "payer champions." Usually, the payer champions did not push an approach or strategy used by their organization but rather encouraged others to remain engaged and to continue making progress. Multistakeholder faculty indicated one senior leader was “really working hard to make sure that everybody’s able to move forward as a cohesive group and not being held up by corporate bureaucracy.” For example, in two regions, a payer champion spearheaded data aggregation efforts both by assuming a lead role on key tasks (such as reviewing vendor qualifications) and by encouraging other payers to commit the needed time and resources. Senior staff with decision-making power in their organization (as opposed to junior staff) served as particularly effective champions, often marshaling resources within their own organizations and energizing their counterparts within other payer organizations.
- **Incorporating CPC practice perspectives.** Including the perspectives of CPC clinicians, practice managers, and/or health system representatives was another key to successful collaboration in five regions. In many regions, payers’ commitment to CPC was reinvigorated after hearing about practices’ successes in CPC as well as their challenges in making further changes. Moreover, payers in all regions that achieved data aggregation or aligned CPC with SIM initiatives indicated that practice perspectives were critical to designing those efforts and obtaining participation in them.

4.5.2. Collaboration between CMS and other payers

As noted in Section 2.3, CMS’s leadership was critical for achieving broad payer participation and active engagement in CPC. Many payers joined CPC because CMS’s participation brought substantial resources to their region, potentially increasing the impact of their ongoing initiatives. These payers frequently indicated that the care management fees for and data feedback on Medicare FFS beneficiaries that CMS contributed to CPC set this initiative apart from prior regional multipayer efforts. Additionally, payers consistently reported that CMS funding for CPC practice learning activities and meeting facilitation helped propel the initiative forward.

Although payers valued CMS’s participation, CMS had a somewhat rocky relationship with most participating payers at the outset of CPC. Several factors contributed to this dynamic. In some regions, payers, including state Medicaid agencies, had been working together for a long time and viewed national CMS representatives as outsiders at the start of CPC. In particular, CMS often had difficulty establishing trust with payers in regions characterized by strong prior collaborative efforts. In these tight-knit communities, the tendency to view both CMS and other new payers as outsiders initially resulted in an “us versus them” dynamic, which impeded collaboration. Moreover, gaining payers’ trust early in the initiative was difficult because CMS’s budget and federal travel restrictions did not allow staff from CMS’s national headquarters to travel to CPC regions to attend meetings in person (which many payers indicated was important to building trust).

Additionally, in the first few years of the initiative, CMS faced several unforeseen challenges as it rolled out one of its first national multipayer initiatives (and the first one to involve data aggregation). CMS's dual role as both the initiative's convener and a participating payer initially created tensions with most payers. In several regions, payers expressed frustration that CMS's need to create a single national program meant that most components of CPC had to be standardized across the seven regions rather than being tailored for local contexts (as CMS did for another of its primary care initiatives, the Multi-Payer Advanced Primary Care Practice Demonstration, in which CMS participated as a payer but played no convening role). Frustrated with the lack of regional adaptation, one payer said, "We are talking only about CPC in these meetings, but there is just so much overlap with work we are doing on a broader basis [in the region]…. We want to tie this to broader conversations in other forums, where the same kind of issues are being talked about." Similarly, payers were discouraged by what they viewed as top-down directives from CMS on topics such as data aggregation and the frequency and structure of CPC multistakeholder meetings. Payers were also frustrated that CMS modified its approach to selecting and contracting with data aggregation vendors over time because of internal legal and bureaucratic hurdles.

Learning from their early experience working with CPC payers, CMS began working to alter its collaborative approach in the second year of CPC. As a result, CMS's relationships with most participating payers had improved by the following year, and continued to improve gradually during the remainder of the initiative. Specifically, CMS took the following actions:

- **Worked to establish trust with other payers.** To build rapport with other payers, CMS representatives increased the number of individual calls it had with payer representatives to better understand their perspectives on CPC. Additionally, in several regions, CMS's shift to having staff from CMS regional offices participate in CPC regional meetings—in contrast to its initial approach in which all CPC representatives were from national headquarters—helped improve communication. In these cases, regional representatives could sometimes attend meetings in person and were better positioned to understand and work within the regional context.
- **Clarified its collaborative role and limitations.** CMS more clearly communicated to regional payers when it was acting as the convener of CPC and when it was serving only as another payer collaborator. CMS also more clearly communicated its organizational constraints, such as federal government contracting requirements.
- **Deferred to other payers on regional decisions.** CMS took a back seat in regional collaborative decisions so as not to let its own bureaucratic constraints slow the momentum achieved by regional stakeholders. For example, the three regions that achieved data aggregation—Colorado, Ohio/Kentucky, and Oklahoma—moved ahead with selecting and contracting with their data aggregation vendors without CMS. CMS subsequently joined those efforts.

4.5.3. Collaboration between non-CMS payers and other stakeholders

Payers generally valued the opportunity to collaborate with practices and other stakeholders, such as employers or hospital associations, though they also reported challenges maintaining their active, consistent engagement. In particular, payers valued the opportunity to discuss CPC with practices. Several payers expressed the view that practices played a more vital role in CPC multistakeholder meetings than any other stakeholder type because the initiative was aimed at supporting practices. As described above, in many regions, payers' commitment to CPC was reinvigorated after hearing about practices' successes in CPC as well as their challenges to making further changes. Moreover, payers indicated that practices' perspectives were critical to developing coordinated approaches to data feedback.

> Practices are the life blood of this whole initiative…Hearing it straight from them about what's worked and what hasn't has been one of the most illuminating pieces [of multistakeholder meetings]…But I worry that we're not hearing from a true representation [of all CPC practices] in our region…[especially] the small, independent practices. They just can't afford to block off all this time to be away from the office, away from their patients.
>
> *—CPC payer, 2015*

Payers' opinions of the usefulness of inviting other stakeholders to join CPC meetings were mixed. Payers found other stakeholders' participation most valuable when the stakeholders had the expertise needed to actively participate in discussions in a meaningful way. For example, some payers reported that consumer representatives added more value to sessions on patient engagement or care coordination than to discussions of data aggregation or other technical or logistical aspects of the collaboration. As another example, self-insured employers participating in CPC helped payers in several regions develop strategies to recruit other employers to the initiative. In another region, the multistakeholder faculty indicated that engaging the region's hospital associations in multistakeholder meetings helped propel strategies to improve care coordination across the medical neighborhood.

Although payers and multistakeholder faculty valued the participation of practices and other stakeholders, engaging them was challenging. Payers and multistakeholder faculty identified similar challenges to engaging all groups: (1) participants had difficulty finding time and resources to attend the meetings (this was particularly true for small, non-system-based practices, which were less likely to have management and administrative resources to devote to attending meetings); (2) participants were often also involved in other multistakeholder groups in the state; (3) participants lacked the skills and experience to productively contribute to discussions; and (4) the vision for CPC collaborative goals and the roles of stakeholders were not always clear. As one multistakeholder faculty member described the challenge, "There was not clear guidance or direction or purpose and goals for the multistakeholder meetings. We want stakeholders at the table, but there was not a clear sense of what [CMS and other payers] were hoping to get with that." Several payers and multistakeholder faculty suggested that multistakeholder meetings might have been more productive—and might have stimulated greater stakeholder participation and engagement—if stakeholders had been invited to only the portions of meetings that addressed topics of concern to them and on which they might be expected to make meaningful contributions.

5. HOW DID CPC PRACTICES CHANGE THE WAY THEY DELIVERED CARE THROUGH WORK ON SPECIFIC MILESTONES?

CPC required participating practices to make many complex, interconnected changes in how they deliver care to their patients, by focusing on five key functions: (1) access and continuity, (2) planned care for chronic conditions and preventive care, (3) risk-stratified care management, (4) patient and caregiver engagement, and (5) coordination of care across the medical neighborhood. To promote progress on these functions, CMS specified a series of Milestones at the start of CPC, and updated the Milestone requirements annually to build on practices' progress in the prior year (Table 5.1). Some Milestones straddle more than one function.

In this chapter, we detail practices' work implementing CPC overall and targeting each Milestone, using a range of data sources. In Section 5.1, we summarize key findings on practices' changes in care delivery, and facilitators and barriers to this work. In Section 5.2, we provide an overview of the Milestones and our data sources. In Section 5.3, we describe changes over time in CPC practices' approaches to care delivery. In Section 5.4, we discuss progress on Milestones 2 through 9, which relate to practice transformation.[46] In Section 5.5, we describe the monitoring of practices' progress on achieving the Milestones. In Section 5.6, we summarize the barriers and facilitators to implementing changes in care delivery and their implications for other primary care initiatives.

5.1. Key findings on practices' changes in care delivery

Across the CPC Milestones, multiple data sources provide clear evidence that practices have undertaken substantial, challenging transformation and improved how they deliver care over the course of CPC. In the first year of CPC (PY2013), practices worked to set up staffing, initial care processes, and workflow. In PY2014, practices made meaningful progress on each CPC Milestone, demonstrating that they were indeed changing care delivery. PY2015 and PY2016 brought additional refinements to practices' care processes and workflows. Below are key findings from the final year of CPC, including notable changes over the course of the initiative:

- **Overall primary care approaches.** As measured by the annual practice survey, CPC practices' approaches to primary care delivery improved each year of the initiative. Overall scores on the modified Patient-Centered Medical Home Assessment (M-PCMH-A) included in the survey indicate that CPC practices achieved their largest care delivery gains between 2012 (baseline) and 2014. In the final two years of the initiative, they achieved more modest improvements.
- **Areas of greatest improvement.** Between 2012 and 2016, across the seven M-PCMH-A domains[47] in the practice survey, CPC practices had the largest improvements in risk-stratified care management, access to care, and continuous improvement driven by data. In the remaining four domains—continuity of care, coordination of care across the medical

---

[46] This chapter does not include Milestone 1: Budget, because it does not reflect transformation; see Chapter 3 for this information.

[47] Based on the factor analysis, we broke one of the six domains in the instrument into two domains, for a total of seven domains, and mapped 37 of the M-PCMH-A questions to these domains.

neighborhood, planned care for chronic conditions and preventive care, and patient and caregiver engagement—scores improved to a lesser extent. Gains in each domain increased most during the first two years of the initiative. Comparison practices also showed improvements, though to a lesser degree than CPC practices. In 2016, the last year of CPC, 29 percent of CPC practices had overall PCMH-A scores indicating the most advanced approaches to care delivery (scores of 10 to 12) compared to 19 percent of comparison practices.

- **Correlation with practice characteristics.** As in prior years, patterns of care delivery reported on the practice survey by CPC practices in 2016 generally did not correlate with practice characteristics (such as practice size, practice ownership, rural/urban status, and how the practice compensated clinicians) or CPC funding per clinician.
- **Types of practices that improved the most.** CPC appears to have helped some practices improve their approaches to care delivery more than others between 2012 and 2016. The three types of practices that showed the most improvement are those that (1) had lower scores on the M-PCMH-A at baseline, (2) were not a recognized PCMH before CPC, and (3) were rated in the bottom two-thirds of CMS scores for their application to participate in CPC (Dale et al. 2016). All three groups had lower average scores in 2012 than CPC practices overall; therefore, these practices may have achieved larger increases because they had more room for improvement.
- **Care management for high-risk patients (Milestone 2).** Deep-dive data (in-depth interviews with clinicians and staff at 21 diverse practices that were selected for intensive study) indicate that practices perceived that the biggest benefit of CPC participation was increased capacity to provide care management services to high-risk patients. All data sources indicate this was the area of greatest transformation for CPC practices, and most of this progress occurred between 2012 and 2015.
  - Deep-dive and Milestone data indicate that, by 2016, CPC practices had stopped making major changes to their risk-stratification methodologies. Similar to 2015, practices used a combination of approaches to risk-stratify their patients, most commonly clinical intuition and clinical algorithms.
  - In the second half of CPC, practices increasingly integrated care managers' work with clinicians, which had been a challenge earlier. Clinicians developed trust in care managers to handle patient follow-up after observing how care managers' efforts improved patients' adherence to recommended treatments, reduced the need for clinicians to handle this task, and allowed clinicians to focus on more complex clinical care.
    - As in previous years, challenges with care management remain:
      - For example, deep-dive findings indicate that care managers in several practices perform numerous tasks in addition to the activities under Milestone 2. In some cases, this resulted in turnover because care managers felt overwhelmed.
      - The use of care plans remains uneven, and clinicians and care managers in most deep-dive practices continued to report limited EHR functionality for supporting care plans and care management.

  - A few system-level respondents were frustrated about multiple guidelines and different requirements for care plans from various payers and medical home initiatives.
  - In addition, deep-dive and practice survey results indicate that duplication of patient outreach by practice-based care managers and those affiliated with hospitals, health systems, health plans, or visiting nurses associations continues to confuse patients and frustrate care managers; survey data indicate that this also occurs in comparison practices.

- **Behavioral health integration (Milestone 2).** To identify patients for behavioral health support, CPC practices most commonly use screening tools, staff or provider referrals, and patient self-referrals. They most commonly deliver behavioral health services by providing (1) referrals to specialty mental health care, (2) primary care management with referral as needed to specialty mental health care, or (3) co-management between primary care and specialty mental health care. Practice survey results show that practices built internal capacity to provide behavioral health screening and services: the proportion of practices with behavioral health specialists, clinical psychologists, or social workers on site increased from 19 percent in 2014 to 29 percent in 2016. However, 2016 Milestone data indicate that co-location of such staff varied across CPC regions from 3 to 52 percent. Over half of CPC practices with co-located behavioral health staff report that these staff were fully integrated into primary care workflows, share patient records, and were available for warm hand-offs and acute primary care visits.

- **Access by patients (Milestone 3).** To improve access and continuity, most CPC practices reported in the 2016 practice survey that they offered same or next day appointments and had an on-call clinician available with access to the EHR 24 hours a day, seven days a week. As in previous years, nearly all CPC practices reported using patient portals to improve access, partly because the Stage 2 Medicare and Medicaid EHR Incentive Programs (Meaningful Use) emphasize patient portals. However, in 2016, few Medicare FFS beneficiaries reported that they used these portals regularly in the patient survey. Deep-dive and practice survey data indicate that practices reported that they continued to improve the availability of same-day appointments; telephone access to the practice; and after-hours access to clinicians via email, telephone, or in-person contacts. Nevertheless, beneficiaries in CPC and comparison practices did not report improved experiences with these types of access in the patient survey.

- **Patient experience (Milestone 4).** To improve patients' experience in the final year of CPC, 80 percent of practices conducted patient surveys and 48 percent convened patient and family advisory councils (PFACs) in 2016. Practices' use of PFACs increased throughout CPC, especially between 2013 and 2015. Challenges with surveys included the burdens of conducting and analyzing data, and concerns about data quality. Challenges with PFACs included scheduling, ensuring that a representative group of patients attended, and reassuring patients that their participation was valuable and the practice would use their feedback. Patient respondents who participated in PFACs reported in qualitative interviews that the PFACs' suggestions led to multiple practice improvements around patient outcomes, patient satisfaction, and patient education.

- **Quality improvement (Milestone 5).** As in previous years, quality improvement (QI) remained a major focus for both CPC and comparison practices in 2016. Over time, more CPC and comparison practices reported that all staff share responsibility for QI, as opposed to relegating this work to a QI committee or department. And 40 percent of practices involved patients or caregivers in identifying QI ideas or opportunities. The 2016 clinician and staff survey indicated that two-thirds of CPC and comparison physician respondents are now involved in QI work. Consistent with prior years, in 2016, deep-dive practices typically used ad hoc approaches for practice-level QI; systematic approaches were more common in large and system-owned practices.
- **Electronic clinical quality measures (eCQMs).** Most CPC practices focused QI activities on a narrow set of eCQMs over time. In 2016 and 2015, the eCQMs they most commonly focused on were diabetes: hemoglobin A1c (A1c) poor control, colorectal cancer screening, and breast cancer screening. In past years, deep-dive practices noted that documenting and tracking eCQMs is helpful for QI, but it is resource-intensive. In 2016, deep-dive practices noted that having dedicated staff to support eCQM documentation, analysis, and design of improvement processes facilitated QI.
- **Care coordination (Milestone 6).** Practices made considerable progress through CPC in care coordination related to hospital or ED follow-up. Deep-dive findings indicate practices made progress in building relationships and exchanging information with hospitals about patient discharge. However, several deep-dive practices reported ongoing challenges with accessing hospital records and receiving complete and timely information about their patients from hospitals. According to the practice survey results, there were increases in receipt of information on patients from community hospitals and EDs within 24 hours. In 2016, Medicare FFS beneficiaries at CPC practices were more likely than beneficiaries at comparison practices to report that the provider’s office contacted them within three days of their most recent hospital stay (60 versus 50 percent) or within one week of the most recent emergency room or ED visit (59 versus 51 percent). Deep-dive practices also noted expanded follow-up with patients after hospital and ED discharge and emphasized the importance of care managers in addressing the needs of high-risk patients.
- **Care compacts (Milestone 6).** In addition to working on follow-up after hospital and ED discharge, by the end of the initiative, 41 percent of CPC practices also chose to work on care compacts or collaborative agreements with other providers. Deep-dive findings show practices typically established care compacts, or collaborative agreements, with specialists to which they most frequently refer patients. Most care compacts outlined expectations for referrals and communication between primary care and specialists. A few practices noted that some specialists struggle with multiple collaborative agreements due to variations in requirements among the referring groups. Practices in systems with system-wide EHRs reported that care compacts were less important because all clinicians in their system could view patient information.
- **Shared decision making (Milestone 7).** Practices implemented shared decision making (SDM) slowly in the early years of CPC, in part due to confusion about the concept of preference sensitive conditions, but use of SDM increased steadily. The percentage of CPC practices that reported that they consistently used patient decision aids (PDAs) to help patients and providers jointly decide on treatment options increased from 42 percent in 2014

to 62 percent in 2016 (compared to 25 percent among comparison practices). The top conditions selected for SDM in 2016 were colorectal cancer screening, prostate cancer screening, tobacco cessation, and mammography. According to some respondents, the quality of patient care improved with SDM. However, deep-dive and practice survey results indicate room for improvement in providers' and staff members' understanding of preference-sensitive conditions, providing SDM without overwhelming clinicians, and tracking PDA use and SDM discussions in EHRs.

- **Learning collaborative (Milestone 8).** Similar to previous years, CPC practices greatly valued learning and sharing with other practices in the CPC learning collaborative. Chapter 3 discusses how the learning activities supported practice change.
- **Health IT (Milestone 9).** CPC required practices to use EHRs certified by the Office of the National Coordinator for Health Information Technology (ONC). In 2016, all CPC practices attested that their eligible providers were working toward Stage 2 requirements for Meaningful Use. CPC practices continued to face challenges in obtaining and exchanging timely data from providers outside their practice or system. Health information technology (IT) challenges affected care plan use and care management activities, practices' ability to follow up in a timely way with patients discharged from the hospital or ED, and practices' capacity to track the outcomes of SDM discussions.
- **Patient dismissals.** Previous annual reports noted that some deep-dive practices had suggested that an unintended consequence of CPC's rewards for improving patient outcomes might tempt *other* practices to dismiss patients with poor outcomes. However, CPC practices and comparison practices reported dismissing patients rarely, at similar rates, and generally for similar reasons. Thus, participation in CPC did not appear to make practices more likely to dismiss patients.
- **Perceived benefits of CPC.** Over the course of CPC, deep-dive practice members increasingly perceived benefits to the quality, delivery, and organization of patient care from working on CPC Milestone requirements. Likewise, in 2016 clinician and staff survey results, a large proportion of clinicians and care managers rated CPC highly. Chapter 6 provides more information on practice members' experiences with CPC.
- **Implementation facilitators.** Several practice strategies that cut across the Milestones facilitated CPC implementation. Over time, deep-dive CPC practices increasingly reported *holding regular meetings* (at least monthly) to engage and continue to involve staff in CPC. By the end of the initiative, several deep-dive practices also reported identifying a practice leader (sometimes a physician), or small committee to act as a *CPC champion*—helping to introduce new concepts to the practice and to integrate CPC-related changes into workflows. Finally, several deep-dive practice findings suggest that *establishing care teams* that worked regularly together and clearly outlined clinician and staff roles helped meet patients' needs.
- **Mixed facilitators and barriers.** Some factors, such as system ownership, acted as facilitators to implementing CPC in some cases, and barriers in others. For example, system-owned practices (and practices in regions with robust local health information exchanges) reported reliable, timely access to patients' hospital and ED records, and in some cases, enhanced information exchange with specialists. However, practices described challenges obtaining timely electronic information from unaffiliated providers in order to coordinate

patient care with them. System ownership also benefited CPC implementation by giving access to centralized QI resources, in some cases including CPC project managers, which facilitated practice-level change. However, system ownership sometimes created administrative and bureaucratic barriers to making improvements based on patient feedback and making Milestone-related decisions, such as selecting SDM topics to pursue.

- **Implementation barriers**. Cross-cutting barriers to CPC implementation included the burden of integrating numerous required changes into practice workflows, which particularly affected care managers. Practices also struggled with the volume of administrative and quality reporting, including different reporting requirements across payers. The burden of reporting varied somewhat in deep-dive practices depending on their electronic health record vendor and their IT support. In addition, practices reported it was hard to engage patients in care management activities related to behavior modification, adherence to treatment regimens, and setting health goals; efforts to reduce inappropriate ED use; shared decision making; PFACs and patient surveys; and patient portals. Some practices found that enhanced self-management support, increased use of motivational interviewing, and teamwork helped them better engage patients in their own care.

5.2. Milestones and data sources

5.2.1. Overview of Milestones

The Milestones in Table 5.1 provide guideposts or stepping stones to achieving the five functions.[48] Some Milestones (such as Milestone 9: Health information technology) contribute to multiple functions. Although the Milestones define specific areas of work, they allow practices considerable latitude in how they meet these goals and change the way they provide care. CMS updated Milestones annually and assessed whether practices meet Milestone targets, which are considered the minimum requirements to remain in the initiative.

Table 5.1. CPC Milestones for PY2016

1. **Budget.** Complete an annotated annual budget with PY2015 revenues/expenses and projected CPC initiative practice revenue flow for PY2016 at the start of the year and report actual revenue/expenses for PY2016 at the end of the year.

2. **Care management for high-risk patients.** Maintain at least 95 percent empanelment to provider and care teams. Continue to risk-stratify all patients, maintaining risk-stratification of at least 75 percent of empanelled patients. Expand care management activities for highest risk patients who are likely to benefit from longitudinal care management and those not otherwise at high risk but requiring episodic care management. Provide information about the care plans that are used for both longitudinal care management and episodic care management. Maintain the implementation of and further refine one of three strategies (behavioral health integration, medication management, or self-management support).

---

[48] CMS considered the five functions primary drivers in achieving CPC's aims, as specified in the CPC change package (https://innovation.cms.gov/Files/x/cpcidiagram.pdf). The change package describes the underlying logic of CPC, including the primary and secondary drivers to achieve the aims of CPC and the concepts and tactics that support the changes.

Table 5.1 *(continued)*

3. **Access by patients and enhanced access.** Enhance patients' ability to communicate 24 hours a day, 7 days a week with a care team that has real-time access to their electronic medical records. Continue to implement asynchronous forms of communication (for example, patient portal and email) and ensure timely responses. Measure continuity of care by measuring visit continuity quarterly for each provider and/or care team in the practice.
4. **Patient experience.** Assess patient experience through patient surveys or patient and family advisory council meetings and communicate to patients (using electronic, poster, pamphlet, or similar communication methods) about resulting changes the practice is making.
5. **Quality improvement.** Continue to perform continuous quality improvement using electronic health record (EHR)-based clinical quality measures (eCQMs) on at least three of the measures that practices report annually. Review at least one payer data feedback report (CMS Practice Feedback Report or other payers' reports) to identify a high-cost area and a practice strategy to reduce this cost while maintaining or improving quality.
6. **Care coordination across the medical neighborhood.** Track patients by implementing two of three options: follow up via telephone with patients within one week of emergency department (ED) visits; contact at least 75 percent of hospitalized patients within 72 hours of discharge; and enact care compacts with at least two groups of high-volume specialists.
7. **Shared decision making.** Use at least three decision aids to support shared decision making (SDM) for three preference-sensitive conditions and track patient eligibility for and use of the aids.
8. **Participating in learning collaborative.** Participate in regional and national learning offerings and communicate with regional learning faculty.
9. **Health information technology (IT).** Attest that each eligible professional in the practice is engaged with and working toward attestation for Stage II Meaningful Use in the timelines set by the Meaningful Use program.

Source: CPC PY2016 Implementation and Milestone Reporting Summary Guide.

5.2.2. Data sources

Data sources used to describe practice change are listed in Table 5.2.

Table 5.2. Data sources on CPC practice change practices

Date source	Type of data
Milestone data	CPC practices' self-reported data from 2012 to 2016, submitted to CMS to document their Milestone work.
Practice survey	Fielded to CPC and comparison practices in 2016 (as well as earlier data collected in 2012, 2014, and 2015).[a] This survey includes the modified Patient-Centered Medical Home Assessment (M-PCMH-A) tool that we adapted for the CPC evaluation to capture approaches to care delivery in seven areas that relate closely to CPC Milestones.[b]
Clinician and staff surveys	Conducted in 2013 and 2016 with primary care clinicians in CPC and comparison practices and staff in CPC practices about their experiences delivering primary care. Chapter 6 reports detailed findings from the clinician and staff surveys.

Table 5.2 *(continued)*

Date source	Type of data
Qualitative interviews and observations of deep-dive practices	Qualitative data collected from 2013 to 2016 from 21 deep-dive practices selected for intensive study (3 practices per region; 1 of the original practices did not participate in the final round of data collection).[c] Respondents included a practice clinician lead, other clinicians, CPC project coordinators, care managers, practice managers, Health IT staff and other staff. These data provide information on how practices are implementing changes related to each Milestone and associated barriers and facilitators to implementation. Data were analyzed using the Consolidated Framework for Implementation Research (CFIR) adapted for CPC (Damschroder et al. 2009), as well as a second codebook reflecting the CPC Milestones.
Patient survey	Fielded annually to samples of Medicare FFS beneficiaries attributed to CPC and comparison practices between 2013 and 2016. Based on the Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CG-CAHPS), version 2.0, the survey asked patients to rate their experiences with care from their primary care provider over the past 12 months. Chapter 7 reports detailed findings from the patient survey.
First three annual reports	The first three annual reports describe practice implementation during the first three years of CPC (Taylor et al. 2015; Peikes et al. 2016a; Peikes et al. 2016b). We describe how the current findings differ from or build on those in these prior reports.
Qualitative interviews with a sample of high-risk patients	Data from qualitative interviews with 43 high-risk patients (or their caregivers) undergoing care management in 11 of the deep-dive practices. These telephone interviews were conducted from March to May 2015 (O'Malley et al. 2018).

[a] We conducted four rounds of the practice survey: at the start of the initiative, October through December 2012; 18 to 21 months after CPC began, in April through July 2014; 30 to 33 months after CPC began, from April through August 2015; and 42 to 46 months after CPC began, April through August 2016. (The first round of the practice survey included only CPC practices, because the comparison practices had not yet been selected. The second, third, and fourth rounds included both CPC and comparison practices.)

[b] Although the seven M-PCMH-A domains measured in the practice survey do not align one-to-one with the CPC Milestones or functions, they are fairly consistent with CPC Milestones and functions, cover care processes and supports that prior studies suggest are important to primary care redesign, and are useful for tracking progress in transforming care.

[c] For more information on selection and characteristics of deep-dive practices, as well as analysis methods, see Peikes et al. (2014), Taylor et al. (2015), and Keith et al. (2017).

5.3. Changes over time in CPC practices' approaches to primary care delivery

Mathematica fielded four rounds of the practice survey (2012, 2014, 2015, and 2016) to gather practices' self-reported approaches to various aspects of primary care delivery. In this section, we highlight selected findings for the 471 CPC practices that responded to all four survey rounds.[49] In addition, Mathematica fielded three rounds of the same practice survey (2014, 2015, and 2016) to roughly 850 comparison practices each round; each round between 340 and 423 comparison practices responded to the survey.[50] All rounds of the survey used a modified form of the PCMH-A tool, which we adapted for the CPC evaluation to capture

---

[49] The 471 CPC practices include 28 that withdrew or were terminated from CPC before April 2016.

[50] There were three (rather than four) rounds of the practice survey for comparison practices because comparison practices had not been selected when the 2012 survey was fielded.

approaches to care delivery in seven areas (Table 5.3). We refer to our modified version as the M-PCMH-A.[51]

We analyze 37 questions from the M-PCMH-A survey module in 7 domains.[52] For each question, practices rated their performance on a scale of 1 to 12, divided into four levels (1–3, 4–6, 7–9, 10–12), where 1 signifies the least advanced approaches to delivering care and 12 signifies the best approaches. We created summary composite measures for the seven M-PCMH-A domains, and for the overall score, as weighted averages of each practice's response to all questions in a given domain. We derived the weights from a factor analysis that we conducted on the responses of CPC practices to the 2012 practice survey. Factor analysis uses the correlation between the individual question and the domain it measures to reflect the reliability of each question in measuring the domain. These weights are also referred to as reliability weights (Poznyak et al. 2017). As previously noted, some Milestones (such as Milestone 9: Health information technology) contribute to multiple functions.

Table 5.3. Primary care delivery domains measured by the M-PCMH-A in the CPC practice survey

Domain	Number of questions	Topics
Continuity of care	2	1. Patient assignment to specific provider, and use of that assignment to schedule and monitor supply and demand 2. The extent to which patients are encouraged to, and usually see their own provider and practice team
Access to care	3	3. Flexibility of appointment systems for different-length and same-day visits 4. Asynchronous communication with practice team including patients' preferred mode 5. Patient after-hours access to a coverage team or the practice, and availability of patient's EHR
Planned care for chronic conditions and preventive care	6	6. Availability and proactive use of patient registries by practice teams 7. Availability and use of evidence-based guidelines in care 8. Focus of patient visits on acute and planned care needs 9. The extent to which evidence-based reminders to providers are specific to the individual patient encounter 10. Extent of role of nonphysician practice team members in providing clinical care 11. Extent to which medication reconciliation occurs regularly and is documented in the patient's medical record

---

[51] The first survey round contained 41 questions. We took 26 of these questions (some with slight refinements) from the PCMH-A instrument (v.1.3) developed by the MacColl Center for Health Care Innovation to measure transformation progress in safety net clinics in eight change concept areas established as key components of PCMH (http://www.improvingchroniccare.org/index.php? p=PCMH_Change_Concepts&s=261). To more closely measure the CPC focal areas, we changed the order and domain assignment for some PCMH-A questions. Because the PCMH-A did not cover all aspects of primary care delivery relevant to this evaluation, we added 15 questions that we either developed or adapted from PCMH-A. We dropped three of these questions from the second survey round because they were present elsewhere in the survey. In one case, two items were collapsed into one item about radiology and blood tests. We dropped one question from the scores (because it was not correlated with any other questions), leaving 37 questions that we tracked over time.

[52] The survey module contains six domains; based on a factor analysis, we broke one of these domains into two, for a total of seven domains (Poznyak et al. 2017).

Table 5.3 *(continued)*

Domain	Number of questions	Topics
Risk-stratified care management	3	12. Degree to which a standard method or tool to stratify patients by risk level is used and guides care delivery 13. The provision of clinical care management services for high-risk patients by care managers integrated into the practice team 14. The availability of registry or panel-level data to assess and manage care for practice populations
Patient and caregiver engagement	6	15. Assessment and incorporation of patient and family preferences in planning and organizing care 16. How systematically practice teams involve patients in decision making 17. Extent to which patient comprehension of written and verbal communication is assessed and accomplished 18. The type of self-management support provided by members of the practice team 19. How test results and care plans are communicated to patients 20. The use of feedback from a patient and family caregiver council to guide practice improvements
Coordination of care across the medical neighborhood	10	21. The extent of tracking of patient referrals to specialists 22. The collaborative development of care plans with patients and families that include self-management and clinical management goals, and are used to guide care 23. The extent to which referral relationships with a range of specialists are formalized 24. Availability of behavioral health services for patients 25. The ease of obtaining referrals for specialty care, hospital care, or supportive community-based resources and exchange of relevant information with other providers before and after the patient visit 26. Practice staff follow-up with patients following ED/hospital visits 27. How practices link patients to supportive community-based resources 28. Transmission of patient information when this practice refers patients to hospitals, EDs, and specialists 29. The timeliness of information received from hospitals and EDs following a patient's visit 30. The proportion of patients for whom the practice knows the total cost to payers for medical care
Continuous improvement driven by data	7	31. Practice's use of quality improvement (QI) activities that are continuous and based on proven improvement strategies 32. Extent to which QI activities are conducted by practice teams supported by a QI infrastructure with meaningful involvement of patients and their families 33. The availability of comprehensive performance measures to practice site and individual providers 34. Availability of feedback reports on patient care experiences, and care processes or outcomes to practice site, individual providers, practice teams, patients, other teams, and external agencies 35. The availability of staff, resources, and time for QI activities 36. The extent to which hiring and training processes focus on improving care and creating patient-centered care 37. The extent to which responsibility for conducting QI activities is shared by staff and is made explicit through protected time to meet and specific resources to engage in QI

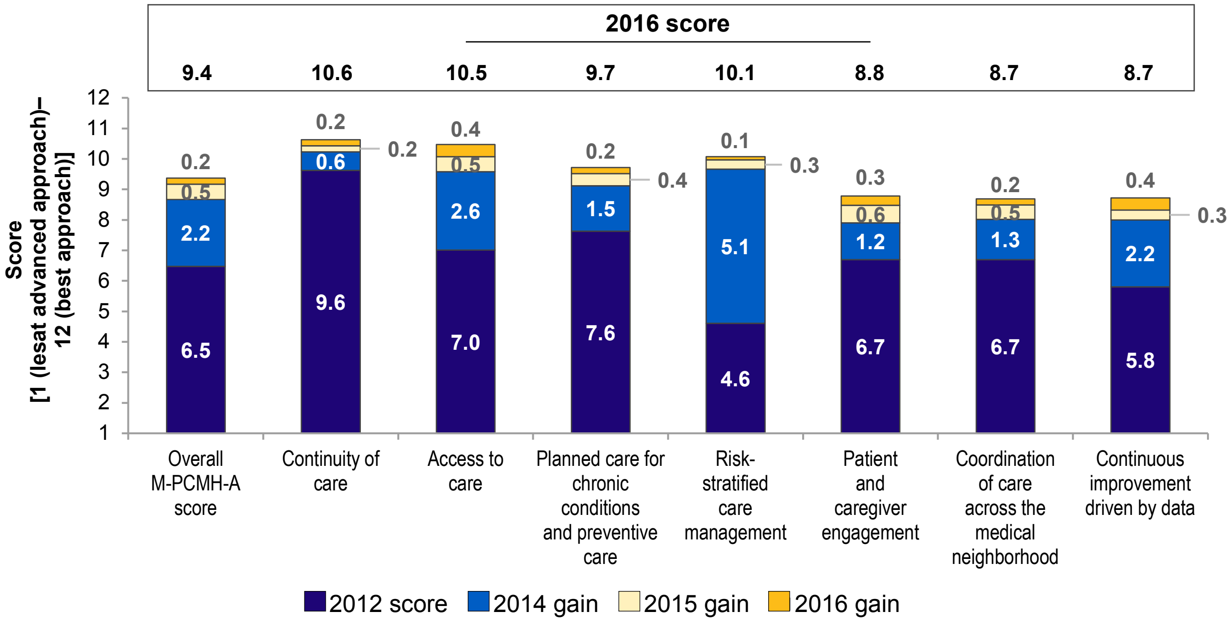
Note: See Appendix D, Table D.5, for a complete list of the survey questions.

Survey data suggest that CPC practices improved their primary care delivery approaches during CPC. Between 2012 and 2016, CPC practices' self-reported approaches to primary care delivery across the seven domains improved 2.9 points (from 6.5 out of 12 to 9.4), measured using the overall M-PCMH-A score. The largest gains occurred between the 2012 and 2014 surveys, with the average overall M-PCMH-A score increasing 2.2 points, from 6.5 to 8.7. In the last two years of the initiative, practices made modest gains of 0.5 and 0.2 points, respectively (Figure 5.1).

CPC practices made improvements in all seven primary care domains from 2012 to 2016, though improvements were larger in some domains than in others. The largest improvements were in risk-stratified care management (5.5 points, from 4.6 to 10.1), access to care (3.5 points, from 7.0 to 10.5), and continuous improvement driven by data (2.9 points, from 5.8 to 8.7). The smallest improvement was in the continuity of care domain, which rose 1.0 point from the relatively high score of 9.6 in 2012. In the remaining three domains, improvements ranged from 2.0 points for coordination of care across the medical neighborhood (from 6.7 to 8.7), to 2.1 points for both planned care for chronic conditions and preventive care (from 7.6 to 9.7), and patient and caregiver engagement (from 6.7 to 8.8).

As with the overall M-PCMH-A score, gains in specific domains were largest during the first two years of the CPC initiative. Between 2012 and 2014, CPC practices' responses indicated average improvements of 0.6 to 5.1 points for each of the seven domains. In 2015 and 2016, CPC practices continued to improve, albeit at a slower rate.

Figure 5.1. CPC practices' mean 2012 M-PCMH-A scores, with 2014, 2015, and 2016 gains, for the seven domains and overall

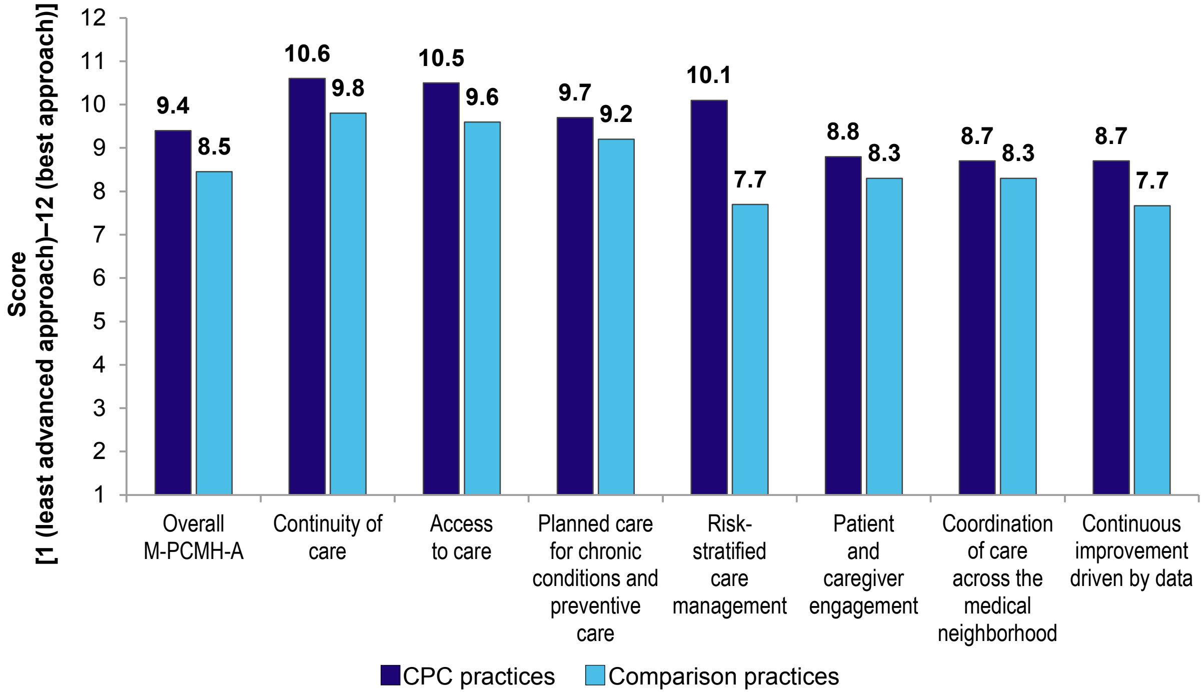


Source: Mathematica analysis of the 2012 CPC practice survey administered October through December 2012, and the 2014, 2015, and 2016 CPC and comparison practice surveys administered April through July 2014, April through August 2015, and April through August 2016. We did not administer the 2012 practice survey to comparison practices.

Note: Scale: 1 [least advanced approach] – 12 [best approach]. We weighted comparison practice responses to ensure CPC and comparison samples were similar and to adjust for nonresponse.

Comparison practices also improved care delivery approaches between 2014 and 2016, although their scores were slightly lower in most years than those of CPC practices. The overall M-PCMH-A score in 2016 for CPC practices (9.4) was 0.9 points higher than the score for comparison practices (8.5; $p < 0.01$) (Figure 5.2). (See Appendix D, Table D.6a.) The largest difference in mean scores between CPC and comparison practices in 2016 was for risk-stratified care management (where CPC practices scored 2.4 points higher than comparison practices, 10.1 versus 7.7 points, respectively), perhaps reflecting the CPC emphasis on this domain. In the other six domains, 2016 scores were only slightly higher (1 point or less) for CPC practices than for comparison practices. The improvements in comparison practices' scores may indicate that they are facing similar pressures and incentives to improve care delivery.

Figure 5.2. CPC and comparison practices' mean M-PCMH-A scores in 2016, for the seven domains and overall



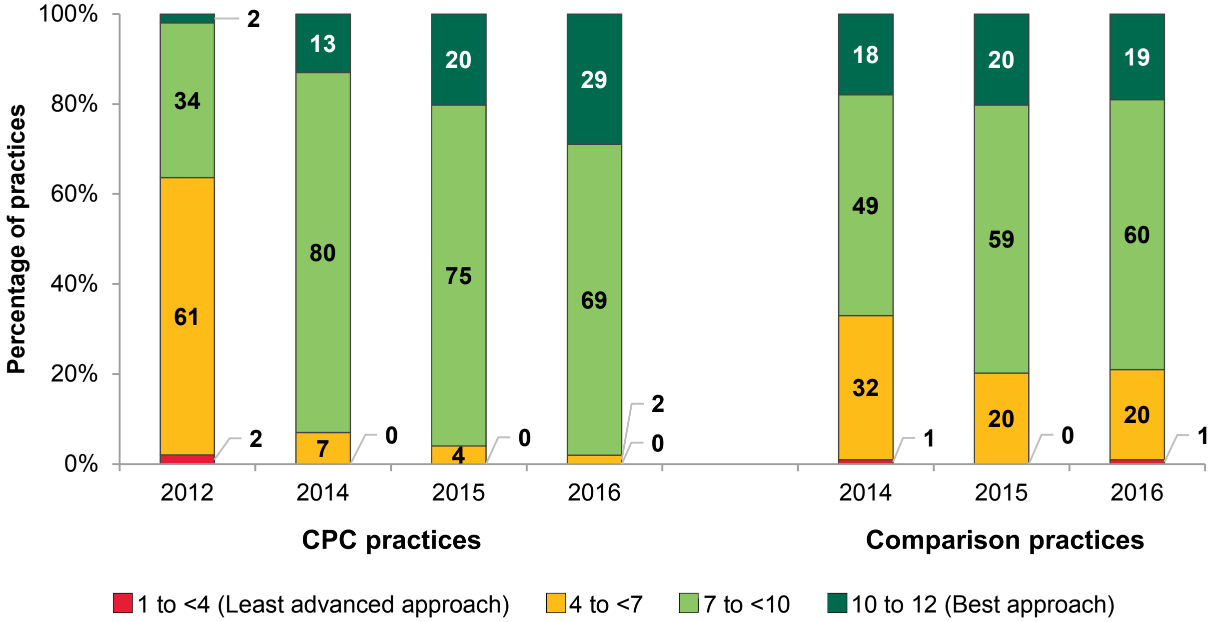
Source: Mathematica analysis of the 2016 CPC practice and comparison practice survey administered April through August 2016.

Note: Scale: 1 [least advanced approach] – 12 [best approach]. We weighted comparison practice responses to ensure CPC and comparison samples were similar and to adjust for nonresponse.

Between 2012 and 2016, overall M-PCMH-A scores improved for 97 percent of CPC practices. The proportion of CPC practices with scores in the highest performance category (10 to 12) also grew from 2 percent in 2012 to 29 percent in 2016 (Figure 5.3). CPC practices in the two highest performance categories combined increased dramatically between 2012 and 2014, from 36 percent to 93 percent, and reached 98 percent in 2016. By 2016, less than 1 percent of CPC practices had an overall score in the least advanced category (1 to 4), and only about 2 percent were in the second lowest category (4 to 7).[53] In 2016, there was little variation across regions: the average overall M-PCMH-A scores ranged from 9.2 in Arkansas and Oregon to 10.1 in Ohio/Kentucky.

Although the average overall M-PCMH-A scores for the CPC and comparison practices were fairly similar (9.4 versus 8.5 points), the distribution of scores highlights the improvements CPC practices made relative to the comparison group. In 2016, 29 percent of CPC practices had overall PCMH-A scores indicating the most advanced approaches to care delivery (scores of 10 to 12) compared to 19 percent of comparison practices. Only 2 percent of CPC practices had scores in either of the lowest two performance categories (1 to <4 or 4 to <7), whereas 21 percent of comparison practices had scores in that range (Figure 5.3).

Figure 5.3. Distribution of CPC and comparison practices' overall M-PCMH-A scores over time



Source: Mathematica analysis of the 2012 CPC practice survey administered October through December 2012, and the 2014, 2015, and 2016 CPC and comparison practice surveys administered April through July 2014, April through August 2015, and April through August 2016. We did not administer the 2012 practice survey to comparison practices.

Note: Scale: 1 [least advanced approach] – 12 [best approach]. We weighted comparison practice responses to ensure CPC and comparison samples were similar and to adjust for nonresponse.

As in prior years, improvements in CPC practices' overall M-PCMH-A scores generally did not correlate with practice characteristics or CPC funding per clinician. The magnitude of CPC practices' changes in overall M-PCMH-A scores from 2012 to 2016 was not consistently associated with practice size, practice ownership, or rural/urban status (all measured

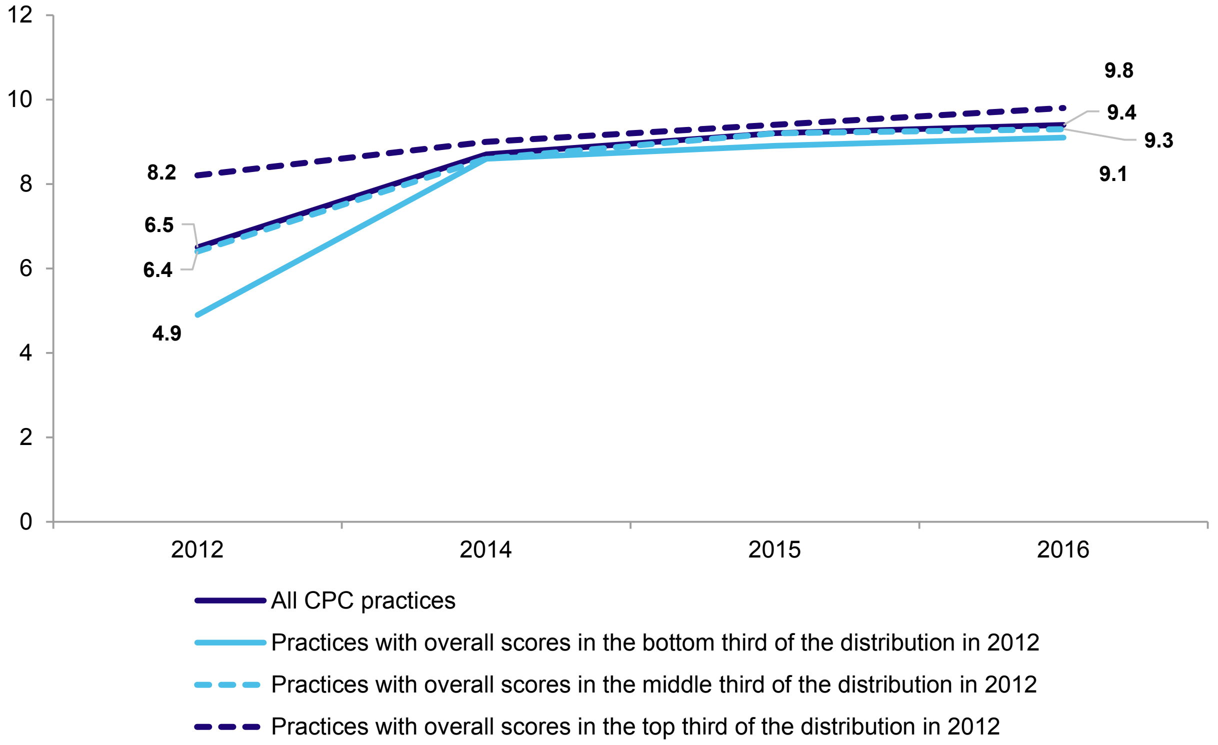
---

[53] The minor fluctuation between 0 percent and 1 percent in the least advanced category for years 2014 through 2016 may be due to rounding.

before CPC began), or how clinicians were compensated by the practice (as reported the first time this was collected, in 2014), or CPC funding per clinician (proxied by the funding in the first program year of CPC) (see Appendix D, Table D.7). The three characteristics associated with larger increases in M-PCMH-A scores were practices that (1) had lower scores on the M-PCMH-A at the start of CPC, (2) were not a recognized PCMH before CPC, and (3) were rated in the bottom two-thirds of CMS scores on their application to participate in CPC.

The distribution of M-PCMH-A scores narrowed over time among CPC practices. As shown in Figure 5.4, scores converged from 2012 to 2014 and remained close from 2014 to 2016. CPC practices with overall M-PCMH-A scores in the bottom third of the distribution in 2012 (scores from 1 to 5.7) had an average improvement of 4.2 points by 2016. Practices in the middle third of the distribution had an average improvement of 2.9 points, and practices in the top third of the distribution (scores from 7.2 to 12) had an average improvement of 1.6 points.

Figure 5.4. CPC practices' average overall M-PCMH-A scores, for all practices and by practices' 2012 score



Source: CPC practice surveys administered October through December 2012, April through July 2014, April through August 2015, and April through August 2016.

5.4. Progress on individual Milestones

In this section, we discuss CPC practices' progress on Milestones 2 through 9. (We discuss Milestone 1—which focuses on budgeting of CPC funds—in Chapter 3, because it reflects a program support, rather than a care delivery activity.) We draw these findings primarily from the

Milestone data that practices submitted to CMS,[54] results from the practice, clinician and staff, and patient surveys, and qualitative data collected during site visits to deep-dive practices. When possible, we discuss how findings from various data sources align or differ, and we use the deep-dive data to provide context and more nuanced information on how practices are changing as well as barriers and facilitators to those changes.

We focus on findings from 2016; additional details on Milestone implementation from earlier years appear in the previous annual reports (Taylor et al. 2015; Peikes et al. 2016a; Peikes et al. 2016b). CMS deepened the requirements of some of the Milestones each year of the CPC initiative. A summary of changes in Milestone requirements by year is available at https://innovation.cms.gov/Files/x/CPCI-Milestones.pdf. (See Appendix A.)

5.4.1. Milestone 2: Care management for high-risk patients

Deep-dive practices, CMS, other participating payers, and learning faculty continued to note that Milestone 2 is one of the most important and challenging CPC Milestones. In PY2016, Milestone 2 required practices to continue to risk-stratify their patients and refine their risk-stratification methodology as needed to align patients' needs with care management resources, expand care management activities to include patients with rising risk (that is "with health risks and chronic conditions that are not well controlled") as well as the highest-risk patients, and develop and maintain care plans for care managed patients.

To perform risk-stratified care management in PY2016, practices were required to continue the following four activities:

1. Empanel each active patient (link each patient directly to a provider or care team that has responsibility for that patient). CMS allowed practices to define "active patients" but recommended that they include those who sought care from the practice in the past 24–36 months.
2. Risk-stratify each empanelled patient to help define his or her risk level.
3. Provide care management resources to the population identified as most likely to benefit from those services. Focus on patients identified by the practice's risk-stratification methodology to be at high risk or rapidly rising risk (for example, those that are clinically unstable, in transition, and/or high utilizers of services) and likely to benefit from active, ongoing, longitudinal care management and those patients not otherwise at high risk who are identified by a triggering event (for example, a transition of care or new diagnosis) as requiring episodic care management for a limited period of time.
4. Provide information about any care plans used for longitudinal (ongoing) care management and episodic (time-limited) care management. Practices were not required to develop or maintain care plans.

---

[54] The number of practices that reported Milestone data fell as practices withdrew or were terminated from CPC. For example, 446 practices reported data in Quarter 1, 439 in Quarter 3, and 439 in Quarter 4 of 2016. Practices were required to report on different Milestones in each quarter, with the bulk of reporting occurring in Quarters 1 and 4.

In addition to continuing the risk-stratified care management work on this Milestone, CPC asked practices to continue to implement one of three advanced primary care strategies: (1) self-management support, (2) behavioral health integration or (3) medication management (CMS 2015a). *Self-management support* of chronic conditions aims to support patients in building the skills and confidence they need to reach their health goals. It requires a collaborative relationship between health care providers and/or teams and patients and their families. *Behavioral health integration* refers to the integration of primary care with behavioral health care which addresses mental health and substance abuse conditions, stress-linked physical symptoms, patient activation, and health behaviors. In CPC, it also includes the needs of individuals with dementia and their caregivers. *Medication management* includes scheduled monitoring of patient medications; medication reconciliation, particularly during transitions of care; protocol-guided medication management; with the assistance of a clinical pharmacist or a licensed practitioner with prescribing authority.

a. Overview of findings

All data sources examined demonstrate that CPC practices made progress in implementing risk-stratified care management during the initiative, especially between 2012 and 2014. Overall, CPC practices appear to have successfully implemented risk-stratification and care management. The deep-dive data indicate that, by 2016, CPC practices had stopped making major changes to their risk-stratification methodologies.

CPC practices used more systematic and team-based approaches to risk-stratified care management than did comparison practices. However, CPC practices also continued to face challenges with the care manager role and the use of care plans, which may have implications for the elements of CPC that will be sustained after the initiative ended. The survey results continue to show that substantially more CPC practices than comparison practices reported that (1) they used standardized risk-stratification processes and (2) care managers who are practice care team members were systematically providing care management services to high-risk patients. However, several deep-dive practices continued to report that care managers feel overwhelmed with numerous responsibilities, and most deep-dive practices described challenges implementing the use of care plans as intended by CPC. The survey results and findings from interviews with deep-dive practices indicate that duplication of patient outreach by care managers from within and outside the practice confuses patients in both CPC and comparison practices.

CPC practices made progress implementing the advanced primary care strategies introduced in the second year of the initiative. The practice survey results show that, between 2012 and 2016, CPC practices (1) increased their capacity to provide self-management support, including training practice staff on patient empowerment and problem-solving methodologies, and improving techniques for communicating with patients; and (2) increasingly provided regular medication reconciliation to all patients. The practice survey and deep-dive findings indicate that more CPC practices established methods to systematically identify patients for behavioral health support and increasingly integrated behavioral health specialists into primary care workflows.

b. Detailed findings

b.1. Empanelment

In PY2016, practices continued to successfully empanel "active patients" to a provider or care team, a required first step in risk-stratified care management. Milestone data submissions showed a moderate increase in the percentage of CPC practices' active patients who were empanelled (from 91 percent in 2013 to 99 percent in 2016). Across CPC regions, CPC practices empanelled 82 to 100 percent of patients in 2015 and 93 to 100 percent in 2016. In the 2016 practice survey, 97 percent of CPC practices and 89 percent of comparison practices reported that they assigned patients to panels and routinely used panel assignments for scheduling (Appendix D, Table D.8a.)

b.2. Risk-stratification

All practices risk-stratified their empanelled patients, and by PY2016, most CPC practices seemed satisfied with their risk-stratification methodologies. Data from the deep-dive practices indicate that these practices had stopped making major changes to their risk-stratification methodologies, but a few continued to refine them. For example, some added a risk level to identify patients near the end of life, or added flags to emphasize patients' social and behavioral health needs or their willingness to engage in care management.

Milestone as well as deep-dive data indicate that, similar to PY2015, all practices continued to use a combination of two or more data sources to risk-stratify their patients (Table 5.4). Most commonly, practices continued to combine clinical intuition based on a provider's knowledge of the patient with a clinical algorithm (either published or developed by the practice). About one-quarter of practices included claims data in their risk-stratification methodology, and about one-quarter used an EHR-generated risk score.

Milestone data indicate regional variation in the use of these sources; for example, only 26 percent of Oklahoma practices reported that they used clinical intuition, whereas 83 percent of New Jersey practices reported doing so. Practices' use of a practice-developed clinical algorithm ranged from 39 percent in New Jersey to 72 percent in Colorado (Table 5.4).

Table 5.4. Types of data used by CPC practices to risk-stratify patients in PY2016, CPC-wide and by region

Types of data used for risk-stratification	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Clinical intuition (Practice risk-stratifies patients based on provider's knowledge of patient and global assessment of that patient's risk)	68%	79%	67%	83%	74%	75%	26%	72%
Clinical algorithm—practice developed (Practice risk-stratifies patients based on algorithm constructed by the practice)	57%	63%	72%	39%	51%	56%	54%	63%
Clinical algorithm—based on published algorithm (Practice risk-stratifies patients based on a published algorithm)	44%	47%	29%	61%	52%	20%	72%	32%

Table 5.4. *(continued)*

Types of data used for risk-stratification	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Claims (Payer data generated risk scores—for example, HCC scores)	27%	23%	22%	41%	29%	59%	10%	3%
Electronic health records (EHR program identifies and generates risk score using specified clinical variables)	22%	14%	17%	22%	6%	53%	13%	25%
Combination of two or more of the above	100%	100%	100%	100%	100%	100%	100%	100%
Number of practices	446	57	69	54	65	75	61	65

Source: Mathematica analysis of PY2016 Q1 Milestone submission results provided by CMS.

Note: Percentages for all regions are based on 446 practices that submitted Milestone data for the first quarter of 2016. Practices could check all data types that apply.

In most deep-dive practices, clinicians were responsible for assigning patients' risk scores or approving risk scores assigned by care managers, nurses, or other practice staff. In addition to using risk scores, clinicians and staff in deep-dive practices also identified patients for care management based on recent ED visits or hospitalizations, or clinicians referred patients they thought would benefit from such services. Practices also used claims data from quarterly feedback reports and clinical quality measure reports (for example, from EHR data) to identify patients to target for care management services.

Similar to PY2015, in PY2016, most deep-dive practices indicated that risk-stratification improved the organization and delivery of care. Clinicians and staff continued to report that risk-stratification increased their awareness of high-risk patients' needs and helped them better allocate staffing resources to different patient populations. For example, in a few practices, patients with a single chronic condition (such as patients with diabetes who needed basic monitoring and health education) received care management from a medical assistant. This enabled the care manager to focus on higher-risk patients (such as patients with poorly controlled diabetes and additional chronic conditions). Risk-stratification continued to help practices identify and prioritize high-risk patients and schedule longer appointments for them as needed. In contrast, respondents in one small deep-dive practice questioned the utility of risk-stratification; they perceived that clinicians knew their patients well enough to determine whether they were high-risk and they believed that the time they spent risk-stratifying patients would be better spent delivering direct patient care.

b.3. Risk-stratified care management

In addition to assigning risk scores to empanelled patients, CMS required practices to provide longitudinal and episodic care management services for patients at high or rapidly rising risk whom practices believed were most likely to benefit from intensive support. For PY2016, CMS also required practices to continue implementing and further refine one of the three "advanced care management strategies." These advanced strategies overlap somewhat with general care management activities. Below, we discuss care management generally, and then describe practices' experiences with the advanced strategies.

Overall, the Milestone data show that, by 2016, CPC practices provided care management to 20 percent of patients who were risk-stratified (Table 5.5), ranging from 9 to 33 percent across regions. This was similar to percentages reported in 2015 (10 to 32 percent across regions).

Table 5.5. Average percentage of patients risk-stratified by and receiving care management from CPC practices at end of PY2016, CPC-wide and by region

	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Average percentage of empanelled patients risk-stratified	95%	95%	99%	94%	89%	98%	99%	93%
Average percentage of risk-stratified patients receiving care management	20%	25%	9%	33%	10%	25%	27%	17%
Number of practices	438	56	67	53	63	75	60	64

Source: Mathematica analysis of PY2016 Q4 Milestone submission results provided by CMS.

Note: Percentages for all regions are based on 438 practices that submitted Milestone data for this item for the last quarter of 2016. The percentage of patients was calculated for each practice and then averaged overall within each region. Estimates give each practice the same weight, regardless of practice size.

Although all CPC practices risk-stratified empanelled patients and many increasingly used risk-stratification for care delivery, some still needed to integrate it into care delivery. In the practice survey, the percentage of CPC practices that reported "standard methods or tools to stratify patients by risk level were available, consistently used, *and integrated into all aspects of care delivery*" increased dramatically from 5 percent in 2012 to 60 percent in 2014, rose to 75 percent in 2015, then changed little in 2016 (73 percent). Although not all CPC practices did this, indicating room for improvement, the CPC practices reported stronger risk-stratified care management than did comparison practices. For example, corresponding percentages for comparison practices were much lower (34 percent in 2014 and 35 percent in 2016) (Appendix D, Table D.8a). In the 2016 clinician survey, a higher percentage of physicians in CPC than comparison practices agreed or strongly agreed that their practice has good systems in place to identify patients at high risk for poor outcomes (88 versus 74 percent). In addition, a higher percentage of physicians in CPC than comparison practices agreed or strongly agreed that their practice intensifies services for patients at high risk for poor outcomes (87 versus 74 percent). (See Appendix E, Tables E.10 and E.11.)

CPC practices also increasingly reported having access to registry or panel-level data to assess and manage care for risk-stratified patient populations across a comprehensive set of diseases and risk states. In the 2016 practice survey, 54 percent of CPC practices reported having this capacity, up from 9 percent in 2012, 42 percent in 2014, and 44 percent in 2015. In 2016, only 33 percent of comparison practices reported having this capacity (Appendix D, Table D.8a).

Care managers

The tasks performed by care managers continue to vary substantially across practices. In many deep-dive practices, care managers were primarily responsible for telephonic or face-to-face chronic condition (longitudinal) care management with high-risk patients and follow-up phone calls after hospitalizations and ED visits (episodic care management). In most practices, care managers call high-risk patients between visits monthly, quarterly, or as needed. In several of these practices, care managers also meet face-to-face with high-risk patients during practice visits. In a few deep-dive practices, clinicians or care managers visit high-risk patients in their homes, in addition to having telephonic contacts and face-to-face meetings in the practice. In some practices, care managers were also responsible for pre-visit planning for high-risk patients, pre-visit telephone calls to high-risk patients, and helping patients navigate the health system as well as obtain social services. Some deep-dive practices' care managers, on the other hand, had more limited responsibilities; for example, they focused narrowly on providing education to high-risk patients with diabetes.

CPC practices greatly increased their use of dedicated care managers who were members of the primary care practice team over time. The number of practice survey respondents from CPC practices who reported that "care managers who were members of the practice team systematically provided care management services to high-risk patients" increased from 20 percent in 2012 to 88 percent in 2014 and 2015, and 89 percent in 2016. In comparison, fewer than half of comparison practices reported in 2016 that care managers who were practice care team members systematically provided these services to high-risk patients (Appendix D, Table D.8a).

Similar to previous years, respondents across deep-dive practices continued to perceive that the biggest benefit of CPC participation was their increased capacity to provide care management services to high-risk patients. Clinicians, care managers, and other practice staff continued to acknowledge the value of the care manager's role in working with high-risk patients, including providing patients with ongoing support to manage their conditions, connecting patients with community-based resources, and planning for patients' visits.

Patients generally had positive impressions of their care managers. During semi-structured interviews with a sample of high-risk patients and caregivers from deep-dive practices, patients who reported having regular contact with their care manager or who were open to working with their care manager felt that the care manager was an asset to their team. Patients particularly valued care managers who listened to them and explained things in lay terms, helped to manage medications and chronic conditions, followed up after a hospitalization, and helped to navigate the health care delivery system and community resources.

Challenges with care management staff feeling overwhelmed with numerous responsibilities and large caseloads persisted in several deep-dive practices. As in 2014 and 2015, respondents in several practices described the numerous tasks care managers were performing in addition to the care management activities for the higher-risk patients defined under Milestone 2. These tasks included providing services to low- and medium-risk patients, such as managing population health by identifying patients with gaps in care; notifying patients of the gaps, and arranging for them to receive the necessary care such as a mammogram or lab test; and coordinating care, which involves tracking patient discharges from the ED and hospital, following up with patients upon discharge, and generally helping patients navigate the health care system. Although these additional tasks are necessary for achieving comprehensive primary care, respondents noted that care managers were already facing challenges trying to meet the

> "I think (care managers) are a little bit overwhelmed (because care management is new to our practice), I think everybody's got a wish list of what an RN can do. And so I think that's been an issue as far as what can they do and how many people can they do it for."
>
> *–Lead clinician*

complex medical and social needs of high-risk patients. Some practices reprioritized tasks or narrowed the focus of care managers' work by 2016, but in those that did not or that had large numbers of patients for care management, care managers felt overburdened.

Respondents in a few deep-dive practices identified challenges with turnover among care managers. Respondents from both independent and system-owned practices described turnover that occurred because care managers felt overwhelmed with numerous responsibilities (as discussed above). In addition, respondents noted that some care managers, particularly those who had previously worked as inpatient nurses, were frustrated that their patient interactions occurred predominantly over the telephone rather than in person. Respondents in a few rural practices added that their rural location contributed to ongoing challenges with hiring qualified care managers.

As in 2015, deep-dive practice respondents described approaches to improving support for care managers, to clarify their roles and enhance staffing resources to help them feel less overwhelmed. In some practices affiliated with health systems, respondents described providing opportunities for care managers embedded in practices across the health system to meet regularly, share best practices, and offer one another support. A few practices were monitoring care managers' caseloads to determine whether they needed more staff to support high-risk patients, or to reduce (or even eliminate) activities focused on lower-risk patients. These practices brought in social workers to help meet patients' social needs and medical assistants to assume logistical or administrative tasks. In a few practices, the care manager role was new and clinicians and staff were uncertain about the care manager's responsibilities; these practices focused on educating clinicians and staff on care management to ensure care managers would not be overwhelmed with requests to provide services to patients for whom care management services are not appropriate.

In 2015 and 2016, deep-dive practices reported that regular communication, delegating care management tasks to non-clinicians, and positive interactions among care team members facilitated implementation of care management and advanced care management strategies. In several practices, respondents described how clinicians developed trust in care managers to handle follow-up with patients after observing how care managers (1) improved patients' adherence to recommended treatments, (2) reduced the need for clinicians to handle this task, and (3) allowed clinicians to focus on more complex clinical care. In some cases, clinicians and care managers noted the importance of clinicians introducing patients to the care manager; this "warm hand-off" positively affected patients' willingness to work with the care manager. Then, as care managers spent time discussing the patients' health and addressing their needs, patients developed trust in the care manager.

Throughout CPC, respondents in a few deep-dive practices reported duplication of services provided by care managers from practices and those affiliated with hospitals, health systems, health plans, or visiting nurses associations. In some cases, care managers not affiliated with deep-dive practices called patients or visited them at home after a hospital discharge, which duplicated the practice-based care manager's efforts. This deep-dive finding is consistent with the 2016 practice survey finding that about two-thirds of both CPC (61 percent) and comparison (66 percent) practice survey respondents reported that such duplication of patient outreach sometimes or often confused their patients. Deep-dive respondents noted that duplication of services could confuse patients about who their care manager was, disrupt the patients' relationship with the practice-based care manager, and frustrate care managers. Similarly, in semi-structured interviews with a sample of high-risk patients and caregivers from deep-dive practices, patients expressed confusion about their care manager's identity, particularly if they had just been discharged from the hospital.

Some practices found ways to address this issue. For example, in a health system that employed navigators to work with high-risk patients, the deep-dive practices' care managers coordinated with the navigators to decrease duplicate calls to patients. In another deep-dive practice, the practice-based care manager described benefits of working with a care manager provided by a regional health plan. In this case, the health plan's care manager was co-located in the practice and worked with commercially insured high-risk patients, helping to reduce the practice-based care manager's caseload.

Care plans

While care plans were not a requirement of CPC, CMS did ask practices to report on their use of them. In the 2016 clinician survey, a higher proportion of physicians in CPC practices than those in comparison practices said that all or most of their high-risk patients receive copies of care plans that include self-management and clinical management goals, and outline steps to achieve those goals (51 percent of physicians in CPC practices versus 39 percent of physicians in comparison practices). However, CPC and comparison practice patients had similar experiences in this regard. In the 2016 patient survey, 47 percent of patients receiving care for a chronic condition in CPC and 46 percent in comparison practices reported that they always received a copy of their treatment plan (such as an after-visit summary). During semi-structured interviews with high-risk patients or their caregivers, few had heard the terms "plan of care" or "care plan," and many did not understand this concept even after we described it. After probing by the interviewers, about one-quarter of the patients described formal care plans and goals (including steps for achieving them), which they had set with their physician and/or care manager.

Most deep-dive practices were not developing and using care plans that reflected patients' care goals, and care teams were not using the care plans to guide ongoing care delivery. As of mid-2016, most practices had not established practice workflows that supported developing care plans as defined under Milestone 2. For 2016, practices were required to develop care plans for all patients receiving care management that documented the patients' goals for care and were accessible to care team members and the patient. However, in a few practices, care managers were working with patients to identify their goals and develop a care plan for the clinician and care team to use for care management. Respondents in these practices noted that documenting patients' health goals in a care plan helped members of the care team to reinforce those goals beyond the clinician-patient visit. More commonly, care managers worked with patients to identify their goals, informed by the clinician's recommendations to the patient. Despite this work to develop and use care plans, clinicians typically did not use the plans to guide their care delivery on an ongoing basis. This suggests opportunities for more practices to obtain patient input and to involve clinicians in care management over time.

Deep-dive practice respondents described diverse ways of using—and interpreting the purpose of—care plans, providing insight into the slow uptake of care plans. Several clinicians we interviewed were unfamiliar with the term “care plan,” whereas other clinicians described care plans in a manner similar to the 2016 Milestone 2 guidelines. Typically, clinicians noted that they have always assessed patients’ needs and helped them plan their care, although they may not formally document it in a “care plan.” Although clinicians believed patients’ needs were extremely important, some viewed care plans as entirely separate documents that were chiefly for the care manager’s and patient’s use. Relative to other practice members, care managers were generally more informed about care plans; this finding resonated with our PY2015 finding that care managers seemed to be the predominant users of care plans. However, care managers in many practices viewed care plans as a condition-specific tool rather than a tool for helping patients and care team members work together to manage *all* of a patient’s conditions and needs. Further, a few system-level respondents described multiple guidelines and different requirements for care plans from various payers and medical home initiatives.

Clinicians and care managers in most deep-dive practices continued to report that their EHR had limited functionality for supporting care management activities, including creating, updating, and accessing care plans. A few practices with internal IT support created a care plan template in their EHRs but still faced challenges developing and modifying the care plans. For example, clinicians and care managers in some of these practices could not update care plans as patients’ needs change; rather, they had to create a new care plan to make changes. Several other practices used EHR work-arounds to develop care plans. For example, in one practice, the care manager used the EHR “phone encounter” module to develop care plans, because the EHR did not have a dedicated location for the care plan. A few practices purchased care management software to support care plan development in their EHRs, but then faced challenges integrating the software into the EHR. Because of this lack of integration, clinicians could not access the care plans and the care manager had to double-enter certain elements of the care plan in another section of the EHR so care team members could access the information. Furthermore, clinicians in several practices perceived the care plans to have limited utility for managing their patients’ clinical needs; they found the encounter notes, lab results, and other data in the EHR to be more clinically relevant than care plans, which often focused on patients’ educational needs.

A few deep-dive practices gave high-risk patients a copy of their care plan or made it accessible on the patient portal. Rather than a comprehensive care plan, several other practices gave patients a paper “visit summary,” typically with instructions from the clinician, and a few posted the visit summary on the patient portal. A few clinicians said that giving patients a copy of their care plan was more than some patients wanted and that patients preferred verbal instructions and more limited written instructions.

CPC practices increased their use of community resources to meet patients’ needs, and reported a higher level of use of community resources than comparison practices. In the 2016 clinician survey, a higher proportion of CPC than comparison physicians agreed or strongly agreed that their practice effectively utilizes community resources to help meet the health care needs of their patients (84 versus 79 percent). This reflects a large increase from 2013, when 67 percent of CPC physicians agreed or strongly agreed that their practice effectively uses community resources to help meet patients’ needs.

b.4. Advanced primary care strategies

Beginning in PY2014, CMS required CPC practices to select one of three CPC advanced primary care strategies for patients in higher-risk cohorts: (1) patient self-management support, (2) behavioral health integration, or (3) comprehensive medication management. In the 2015 Milestone data, 50 percent of CPC practices selected self-management support only, 26 percent reported behavioral health integration only, 9 percent reported medication management only, and 15 percent reported more than one strategy. In 2016, CPC did not require practices to report which advanced primary care strategy they were working on; rather, practices were asked about their use of self-management support, behavioral health integration, and medication management. However, interviews with deep-dive practices in 2016 indicated that practices generally continued to pursue the same advanced primary care strategies they had reported in 2015. In deep-dive practices implementing self-management support and medication management, respondents did not report major changes in how they were incorporating these strategies into practice workflows or in the challenges they were facing or had overcome. However, respondents did describe changes related to implementing behavioral health integration.

Patient self-management support

Patient self-management support involves a collaborative relationship between a member of the practice and the patient and his or her family, to help the patient develop specific skills for managing a target condition or disease, and for activating and increasing the patient's self-efficacy managing health across conditions. This type of support overlaps with the work all practices do for care management in Milestone 2, described above in the section on care management.

In 2016, across CPC regions, the most common target conditions that CPC practices focused on for self-management support were diabetes (93 percent), hypertension (50 percent), chronic obstructive pulmonary disease (COPD) (39 percent), and congestive heart failure (CHF) (38 percent) (Table 5.6).

By 2016, only one-fifth of CPC practices were reporting performance in the top tier (scores of 10–12) for patient and caregiver engagement as measured by the M-PCMH-A. Average domain scores increased from 6.7 points in 2012 to 8.8 points out of 12 in 2016. The measures within this domain most relevant to this Milestone are "assessing patient and family values and preferences and incorporating them in planning and organizing care," "evaluating patient comprehension of verbal and written materials, using translational services or multilingual staff, and training staff in health literacy and communication techniques," and "self-management support provided by practice staff trained in patient empowerment and problem-solving methodologies." The percentage of practices reporting implementing this level of care for the items in this domain rose from 10 to 15 percent in 2012 to 28 to 36 percent in 2016. (See Appendix D, Table D.8a.) The relatively low scores and slow improvement in this domain may reflect that while some payers worked with learning faculty and practices on improving health literacy, the CPC Implementation and Monitoring Guide did not emphasize training for health literacy, translational services, and multilingual staff.

Table 5.6. Conditions that CPC practices focused on for self-management support, CPC-wide and by region

Condition	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Diabetes	93%	98%	87%	98%	100%	96%	71%	97%
Hypertension	50%	58%	30%	79%	75%	47%	22%	46%
Chronic obstructive pulmonary disease (COPD)	39%	46%	32%	7%	23%	43%	92%	20%
Congestive heart failure (CHF)	38%	34%	27%	7%	28%	45%	82%	40%
Tobacco cessation	25%	22%	29%	33%	35%	25%	2%	29%
Hyperlipidemia/high cholesterol	21%	30%	29%	33%	30%	13%	2%	6%
Obesity and weight loss	19%	22%	25%	31%	39%	0%	2%	20%
Diabetes with hypertension	19%	16%	29%	21%	5%	23%	4%	37%
Diabetes with hyperlipidemia	18%	16%	25%	21%	5%	25%	2%	31%
Depression	14%	4%	30%	0%	5%	7%	29%	23%
Asthma	9%	6%	13%	5%	7%	4%	8%	23%
Number of practices	371	50	63	42	57	75	49	35

Source: Mathematica analysis of PY2016 Q3 Milestone submission results provided by CMS.

Note: Table shows percentages of CPC practices that focused on the particular condition. Percentages for all regions are based on 371 practices that submitted Milestone data for this item for the third quarter of 2016. Some practices opted out of responding to this item by selecting the response option “We do not focus on high-risk conditions for self-management support at our practice.” Practices could select up to five focus conditions. They could respond to this item even if they did not select self-management support as their chosen CPC advanced primary care strategy.

While respondents did not report major changes in how they were facilitating self-management support, some deep-dive practices described their approach as evolving from distributing educational materials to patients to also using motivational interviewing to help patients set and track health goals.

Behavioral health integration

Behavioral health integration involves CPC practices offering or coordinating with behavioral health providers to support patients with behavioral health needs, dementia, and poorly controlled physical chronic conditions. In practices’ 2015 Milestone data reports to CMS, the last year for which we can calculate the percentage of practices that chose each advanced primary care strategy, 26 percent of CPC practices reported they were working to implement behavioral health integration.[55] Based on the practice survey, which asked all practices about behavioral health integration regardless of whether they selected it as an advanced primary care strategy, the percentage of CPC practices reporting that they had a behavioral health specialist, clinical psychologist, or social worker on site (part-time or full-time) increased from 19 percent in 2014 to 29 percent in 2016. CPC practices were more than twice as likely as comparison practices to report that they employed one or more behavioral health specialists in 2016 (29 versus 12 percent). Milestone data indicate that the percentage of CPC practices with a

---

[55] This is a conservative estimate. Another 15 percent of practices reported pursuing two or more of the advanced care strategies, but the reporting did not specify which of the strategies they pursued.

behavioral health specialist co-located within the practice varied across regions in 2016 from 3 to 77 percent (Table 5.7). Among CPC practices with a co-located behavioral health specialist, 54 percent indicated that the specialist was fully integrated into the primary care workflow, shared patient records, and was available for warm hand-offs and acute visits (Table 5.8).

Table 5.7. Percentage of CPC practices with behavioral health specialist(s) co-located within the practice in PY2016, CPC-wide and by region

	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Practice has behavioral health specialists co-located within CPC practice	30%	29%	52%	17%	6%	3%	29%	77%
Number of practices	435	55	67	53	63	75	58	64

Source: Mathematica analysis of PY2016 Q3 Milestone submission results provided by CMS.

Note: Percentages for all regions are based on 435 practices that submitted Milestone data for this item for the third quarter of 2016.

Table 5.8. Integration of behavioral health specialists into primary care in PY2016 (among practices with co-located behavioral health specialists), CPC-wide and by region

	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
5 Fully integrated workflow and shared patient records; functionally integrated with availability for warm hand-offs and for acute visits in primary care	54%	38%	54%	33%	75%	0%	71%	57%
4	27%	19%	31%	44%	25%	0%	6%	31%
3 Separate workflow and shared patient records	9%	19%	3%	11%	0%	50%	6%	10%
2	3%	0%	11%	0%	0%	0%	0%	0%
1 Functionally separate with totally separate workflow and separate patient records	8%	25%	0%	11%	0%	50%	18%	2%
Number of practices	132	16	35	9	4	2	17	49

Source: Mathematica analysis of PY2016 Q3 Milestone submission results provided by CMS.

Note: Percentages for all regions are based on 132 practices that submitted these Milestone data for the third quarter of 2016 and reported having one or more behavioral health specialists working full or part time at the practice.

CMS does not specify labels for responses 2 and 4.

Practices used a range of approaches to identify patients needing behavioral health care services. Across all regions in 2016, the most common methods CPC practices used were a screening tool, such as for depression, dementia, or domestic violence (90 percent); referral by staff or provider (71 percent); and self-referral by patient (55 percent) (Table 5.9).

Table 5.9. CPC practices' methods of identifying patients for behavioral health services, in PY2016, CPC-wide and by region

Method	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Screening tools, such as for depression, dementia, or domestic violence	90%	81%	96%	89%	87%	93%	86%	98%
Referral by staff or provider	71%	72%	88%	70%	68%	24%	88%	97%
Self-referral by patient	55%	65%	58%	58%	57%	20%	61%	70%
Clinical indicators, such as patient not reaching goals	40%	47%	34%	51%	32%	16%	31%	73%
Health risk assessment	36%	23%	39%	43%	51%	9%	37%	53%
We do not systematically identify patients for behavioral health services	6%	12%	1%	9%	8%	3%	7%	0%
Other	4%	5%	4%	0%	2%	1%	2%	11%
Number of practices	437	57	67	53	63	74	59	64

Source: Mathematica analysis of PY2016 Q3 Milestone submission results provided by CMS.

Note: Table shows percentages of CPC practices that indicated they used each method. Percentages for all regions are based on 437 practices that submitted Milestone data for this item for the third quarter of 2016. Practices could select all activities that applied.

The most common approaches CPC practices used to deliver behavioral health care included providing a referral for specialty mental health care (83 percent), providing primary care management with referral as needed to specialty mental health care (72 percent), and co-management between primary care and behavioral health specialists (50 percent) (Table 5.10).

Table 5.10. CPC practices' approaches for providing behavioral health care, in PY2016, CPC-wide and by region

Approach	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Referral for specialty mental health care	83%	73%	97%	85%	90%	73%	85%	75%
Primary care management with referral as needed to specialty mental health care	72%	71%	92%	75%	63%	48%	85%	73%
Co-management between primary care and behavioral health specialists	50%	57%	62%	42%	37%	23%	56%	78%
Primary care management with behavioral health specialist consultation and case review	33%	29%	58%	23%	5%	24%	37%	55%
Behavioral health specialists integrated into primary care workflow	29%	16%	64%	15%	5%	3%	29%	73%
None	7%	5%	2%	6%	2%	27%	5%	0%
Other	3%	4%	6%	0%	0%	1%	2%	11%
Number of practices	435	56	66	53	62	75	59	64

Source: Mathematica analysis of PY2016 Q3 Milestone submission results provided by CMS.

Note: Table shows percentages of CPC practices that used the approach to provide behavioral health care. Percentages for all regions are based on 435 practices that submitted Milestone data for this item for the third quarter of 2016. Practices could select all activities that applied.

Respondents in deep-dive practices noted that behavioral health integration has increased practices' capacity to care for patients with co-occurring behavioral and physical health conditions. Respondents described benefits of patients having direct access to a behaviorist (that is, a psychologist, psychiatrist, or clinical social worker), noting that this made clinicians feel better supported in managing patients who needed additional behavioral services. Some practices were expanding patient referrals to behaviorists to help address mental health needs. In a few other practices, respondents noted that depression is under-recognized in the primary care setting and that they had expanded depression screening from patients with a history of depression to all patients.

Over the course of CPC, respondents in the deep-dive practices implementing behavioral health integration formalized behavioral health services and worked to better integrate behaviorists with care teams. These practices formalized relationships with behavioral health providers, including co-locating behaviorists part time in the practice, where they participated in care team meetings. Several respondents described the benefit of clinicians introducing patients to behaviorists, noting that this increased patients' receptivity to behaviorists. Other practices formalized care compacts, outlining expectations for referrals and communication between primary care clinicians and behaviorists outside the practice, particularly when they did not use the same EHR.

> "Both the care manager and the (behaviorist) work together with that patient and share information on that patient, but each has separate job descriptions on what they're going to manage for that patient."
> –*Practice manager*

Practices reported two barriers to behavioral health integration: (1) an inadequate supply of behavioral health providers and (2) unresponsive behavioral specialists in a few regions. Even among a few practices pursuing behavioral health integration as an advanced primary care strategy, clinicians and staff noted that increased screening and assessment of patients was insufficient if the necessary mental health services were unavailable.

Medication management

Comprehensive medication management involves CPC practices performing medication reconciliation and integrating into the practice care team a clinical pharmacist who can manage patients' medications to maximize efficiency, effectiveness, and safety. In 2015, just 9 percent of practices reported that they were working to implement comprehensive medication management only (the 2016 Milestone data did not include this item). This low percentage may be a function of the Milestone requirement that "medication management is built around the skills of a clinical pharmacist as a member of the care team." In the 2016 practice survey data, only 18 percent of CPC practices reported having a pharmacist or pharmacy technician at the practice site. Deep-dive interviews also indicated that few practices had access to a clinical pharmacist as a member of the care team. The two deep-dive practices implementing medication management contracted with or hired part-time pharmacists, who met with high-risk patients in person and spoke with them over the telephone to provide medication-management services.

Reflecting their work on more "routine" medication management and reconciliation that does not require a clinical pharmacist, the percentage of CPC practices that reported on the practice survey that they regularly perform medication reconciliation for all patients and document it in the patient's medical record increased from 75 percent in 2012 to 94 percent in

2016. The most common medication management services CPC practices provided in 2016 included routine medication reconciliation (92 percent), coordination and reconciliation of medications at the time of transitions of care (85 percent), medication monitoring (55 percent), support for medication use and self-management (52 percent), and comprehensive medication review and assessment of medication safety and cost-effectiveness (47 percent) (Table 5.11).

Table 5.11. CPC practices' approaches for providing medication management, in PY2016, CPC-wide and by region

Approach	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Routine medication reconciliation	92%	91%	90%	96%	94%	100%	78%	92%
Coordination and reconciliation of medications at the time of transitions of care	85%	89%	82%	87%	92%	99%	73%	72%
Medication monitoring	55%	66%	72%	60%	41%	53%	23%	69%
Support for medication use and self-management	52%	59%	54%	44%	43%	56%	42%	64%
Comprehensive medication review and assessment of medication safety and cost-effectiveness	47%	38%	42%	56%	37%	72%	40%	38%
Development of a medication action plan or contribution to a global care plan	21%	16%	22%	23%	13%	25%	7%	38%
We do not provide medication management services at our practice	7%	7%	3%	4%	6%	0%	22%	6%
Number of practices	437	56	67	52	63	75	60	64

Source: Mathematica analysis of PY2016 Q3 Milestone submission results provided by CMS.

Note: Table shows the percentages of CPC practices that used each approach. Percentages for all regions are based on 437 practices that submitted Milestone data for this item for the third quarter of 2016. Practices could select all that applied.

CPC practices most commonly identified patients for medication management services (beyond routine medication reconciliation) by identifying those who were undergoing care transitions, on high-risk medications, or directly referred by a provider. Almost one-third of practices reported that they do not routinely select patients for medication management services, and one-quarter of practices reported that they identify patients for medication management services based on poly-pharmacy—the use of multiple medications at the same time (Table 5.12).

Table 5.12. CPC practices method(s) of identifying patients for medication management, in PY2016, CPC-wide and by region

Method	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Patients with care transition(s)	51%	52%	40%	47%	43%	67%	42%	66%
High-risk medications	44%	54%	54%	40%	44%	44%	12%	58%
Direct provider referrals	41%	43%	37%	21%	59%	24%	37%	67%
Patients who have not achieved a therapeutic goal for a chronic condition	33%	34%	46%	28%	22%	24%	20%	55%
Poly-pharmacy	25%	30%	28%	26%	19%	24%	12%	36%
Based on risk cohorts using practice risk-stratification	24%	27%	34%	26%	32%	0%	13%	36%
We do not routinely select patients for medication management services	31%	34%	24%	40%	19%	32%	53%	16%
Number of practices	438	56	67	53	63	75	60	64

Source: Mathematica analysis of PY2016 Q3 Milestone submission results provided by CMS.

Note: Table shows the percentages of CPC practices that used each method to identify patients for medication management beyond routine medication reconciliation. Percentages for all regions are based on 438 practices that submitted Milestone data for this item for the third quarter of 2016. Practices could select all that applied.

Pharmacists initially faced resistance from clinicians and other staff to integrating their roles into practice workflows. In both deep-dive practices that implemented medication management, the pharmacists had to initiate their roles in the practices, which was challenging. Like care managers, pharmacists also described gradually building relationships with clinicians and difficulties obtaining access to clinicians to discuss patients because of clinicians' competing responsibilities. Practices that successfully integrated pharmacists into practice workflows reported they had structured processes and leadership support for doing so.

Finally, in many deep-dive practices, practice members believed the advanced primary care strategy they chose was improving patient care. Self-management support increased practices' focus on using motivational interviewing to help patients set meaningful goals, and practice members perceived that self-management support increased patients' engagement in their care. Practices reported that behavioral health integration increased practice members' (1) awareness of patients' emotional and psychosocial needs, and (2) capacity to engage patients in necessary behavioral health care. For medication management, practice members believed this strategy increased patients' compliance with their medications.

5.4.2. Milestone 3: Access and continuity

In PY2016, Milestone 3 required that practices: (1) attest that patients have access 24 hours a day, seven days a week, to a care team practitioner with real-time access to the EHR; (2) continue at least one form of asynchronous communication (such as email and patient portals) and make a commitment of timely response; and (3) measure continuity of care by reporting visit continuity quarterly for each provider or care team in the practice.[56]

a. Overview of findings

The second largest area of change over the course of the CPC initiative, as measured by the M-PCMH-A, was access. Milestone data indicate that practices most often used patient portals to enhance access. They also increased same or next day appointments and 24/7 access to a clinician with access to the EHR. Practices focused less on other electronic avenues for enhanced access such as web-enabled visits, likely because Stage 2 Medicare and Medicaid EHR Incentive Programs (Meaningful Use) emphasized patient portals. Deep-dive data from previous years suggested that actual use of portals *by patients* was low and patient survey data in 2016 confirmed this impression. Deep-dive and 2016 practice survey data indicate that practices continued to improve wait times for patients to get an appointment; telephone access to the practice for patients; and after-hours access to clinicians via email, telephone, or in-person visits. Nonetheless, patient survey data from Medicare FFS beneficiaries suggest that more work on access—or better communication about it—may be needed. Finally, practice survey data showed an increase in the percentage of practices reporting that they assign patients to a specific panel or provider, and deep-dive practices reported that they continued to encourage patients to schedule with their usual clinician throughout CPC.

b. Detailed findings

b.1. Access to clinicians

Throughout the initiative, practices reported that they worked on increasing access to same-day appointments, improving on-call coverage with practitioners that have 24/7 access to an EHR, and increasing visits outside of the office (that is, home, telephone, or video visits). In their Milestone reporting, all practices reported providing patients with same or next day appointments and availability of on-call clinicians with access to their EHR 24 hours a day, seven days a week, as required by CPC. Some CPC practices also reported enhanced access to office visits—68 percent provided extended hours on weekends, evenings, or early mornings; 61 percent provided a flexible appointment scheduling system; and 38 percent provided after-hours coverage via a formal arrangement or care compact with urgent care centers or other providers (Table 5.13). Many deep-dive practices improved telephone access by increasing the number of phone lines and staff who respond to calls; other practices were planning to hire additional providers to facilitate expanded office hours and same-day appointments. For example, at the time of the 2016 interviews, one practice was recruiting for a nurse practitioner position to reduce double-booking of current providers, and another practice was recruiting for a provider to add appointment slots and create a 12-hour office day. Large systems often provided in-person after-hours access to clinicians via an urgent care clinic owned by the system, which typically existed before CPC. Another practice repurposed its general walk-in hours—instead of seeing any available provider, patients now have same-day access to their specific care team.

---

[56] The requirement for reporting progress for Milestone 3 changed from PY2015 to PY2016. In PY2015, practices had to report whether they determined continuity at the provider or care team level and whether their EHR was capable of calculating and tracking continuity. In PY2016, they had to measure and report visit continuity quarterly for each provider and/or care team in the practice.

Nonetheless, patient survey data suggest that more work on access—or better communication about it—may be needed. In 2016, about 65 percent of CPC and comparison Medicare FFS beneficiaries reported that they were always able to get an appointment as soon as needed when phoning their provider for care needed right away. The percentage of beneficiaries reporting this was constant over time. In 2016, only one-third of CPC and comparison practice beneficiaries who reported needing care during evenings, weekends, or holidays, reported that they were always able to get that care from the provider's office. For the CPC and comparison practices, the differences in practices' descriptions of the availability of enhanced access capabilities is notable, but survey findings on Medicare beneficiaries' experiences with access suggest that further work is needed in CPC practices to improve access or at least to communicate about improved access.

Use of other types of visits to expand access was less common. Sixty percent of CPC practices reported that they provided billable types of alternative visits (Table 5.13), most commonly group education classes (27 percent of practices), home visits (25 percent of practices), and medical nutrition consultation visits (20 percent of practices).

Table 5.13. Percentage of CPC practices reporting each type of enhanced-access activity, in 2016, CPC-wide and by region

Selected enhanced-access activities	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
On-call clinician has 24/7 access to EHR[a]	100%	100%	100%	100%	100%	100%	100%	100%
Number of practices	445	57	69	54	64	75	61	65
Practice provides enhanced office access through:[b]								
Availability of same or next day appointments	100%	100%	100%	98%	98%	100%	100%	100%
Extended hours on weekend, evening, or early morning	68%	47%	80%	83%	79%	85%	28%	64%
Flexible appointment scheduling system	61%	58%	71%	66%	40%	73%	72%	44%
After-hours coverage via a formal arrangement or care compact with urgent care centers or other providers	38%	25%	41%	47%	40%	31%	35%	45%
Other	18%	21%	12%	9%	5%	29%	27%	19%
We do not provide enhanced office access	0%	0%	0%	0%	0%	0%	0%	0%
Practice provides enhanced access outside of office visits through:[b]								
Patients send and receive messages through a patient portal (as defined by Meaningful Use)	98%	100%	100%	96%	98%	99%	97%	97%
Secure email	29%	15%	39%	23%	19%	47%	40%	11%
Other	13%	17%	3%	11%	2%	37%	15%	5%
Text messaging	8%	11%	8%	19%	6%	3%	7%	3%
Web-enabled visits other than through a patient portal	8%	2%	3%	9%	5%	20%	8%	3%
Telemedicine/remote monitoring	5%	13%	8%	2%	6%	4%	0%	2%
None of the above	1%	0%	0%	2%	2%	0%	0%	3%

Table 5.13 *(continued)*

Selected enhanced-access activities	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Practice provides the following (billable) types of alternative visits:[b]								
Practice does not provide these types of alternative visits	40%	45%	15%	32%	31%	39%	77%	47%
Group education classes	27%	15%	55%	17%	19%	44%	12%	20%
Home visits	25%	26%	36%	36%	50%	7%	5%	22%
Medical nutrition consultation visits	20%	19%	36%	11%	26%	19%	7%	17%
Preventive counseling services	14%	17%	20%	21%	11%	12%	0%	20%
Group visits	10%	2%	27%	6%	6%	5%	0%	17%
Other	8%	13%	9%	8%	8%	5%	7%	9%
Number of practices	433	53	66	53	62	75	60	64

Source: Mathematica analysis of PY2016 Q1 and Q4 Milestone submission results provided by CMS.

[a] Percentages for all regions are based on practices that submitted Milestone data for the first quarter of 2016. The number of practices is reflected in the second row of this table.

[b] Percentages for all regions are based on practices that submitted Milestone data for the last quarter of 2016. The number of practices is reflected in the last row of this table. Practices could select all activities that applied.

b.2. Portals

Patient portals where patients can send and receive messages were the most common outside-of-office enhanced-access activity, with 98 percent of CPC practices providing them (Table 5.13). On average, less than one-third of practices pursued each of the other electronic methods to enhance access (Table 5.13), with higher percentages of practices in Colorado, Oklahoma, and Ohio/Kentucky regions reporting use of secure email (39, 40, and 47 percent, respectively).

The practice survey also showed large increases between 2012 and 2016 in the percentage of CPC practices reporting availability of patient communication with the practice team through email, text messaging, or a patient portal. The proportion of practices reporting the availability of this type of patient communication increased from 7 percent in 2012 to 63 percent in 2014, 78 percent in 2015, and 82 percent in 2016. In 2016, CPC practices were more likely to report this type of access than comparison practices (82 versus 67 percent) (see Appendix D, Table D.8a). Despite the increasing availability of these communication capabilities, in 2016, only a small percentage of Medicare beneficiaries in both CPC and comparison practices reported using email to ask the provider medical questions (8 percent, up from 3 percent in 2013). About half of Medicare beneficiaries that responded to the patient survey reported that their provider's office uses a web portal or website that allows them to email the practice, review medical information, request a prescription renewal, or make appointments. Among the beneficiaries that reported their practice uses a patient portal, about half reported using the patient portal at least once in the past 12 months (48 percent of CPC patients and 52 percent of comparison patients).

Although practices worked to have patients register for their portal, and use of portals improved during CPC, use remained relatively low. Between 2012 and 2016, deep-dive practices focused on enrolling patients into practice portals—where patients can review test results, send messages to their providers, request medication refills, and schedule appointments—because this strategy aligns with Meaningful Use requirements. In the first few years of CPC, deep-dive practice staff cited older patients' lack of comfort with technology, technical glitches, and a lack of resources as challenges in getting patients to enroll in and use portals. For example, many practices reported that their elderly patients often did not have access to computers and were less interested in using new technology. Glitches in portal software also presented a challenge for practice staff and patients, particularly in the early years of CPC. For example, many practices reported difficulty logging in, poor compatibility between the portal and the practice's EHR or with specific Internet browsers, as well as problems exchanging messages between providers and patients. Practices tried to resolve these issues by (1) encouraging elderly patients' families and caregivers to assist with enrolling in and using the portal; (2) working with the portal vendor to troubleshoot technical glitches; and (3) using volunteer interns or other clerical staff to explain the portal to patients, enroll patients, and manage messages from the portal.

In 2016, deep-dive practice staff cited challenges with managing portal use. Several respondents perceived that patients who did use the portal sent too many messages through it or expected immediate responses to their messages. For example, one care manager reported that patients were sending portal messages about urgent issues instead of calling the practice, and by the time the provider was able to review the message, no same-day appointments were available.

Despite these challenges, practice leadership and staff saw value in implementing patient portals. Deep-dive clinicians and staff noted that portals improved patient care by reducing back-and-forth phone calls, providing access to after-hours care through e-visits, and increasing patients' access to information from their medical record. Practice clinicians and staff felt that the portal allows patients to play a more active role in their health, empowering them to communicate with practice staff about their conditions via secure messaging, view test results promptly, and prepare for office visits by reviewing lab results within their record. Using the portal reportedly saved staff time and improved workflow by enabling the practice to send reminders about screenings to patients and minimizing the time spent "playing phone tag" to address patients' needs.

b.3. Continuity

The practice survey also showed improvement in continuity of care as measured by the percentage of practices reporting that "patients were assigned to specific provider panels which are used for scheduling purposes and continuously monitored to balance supply and demand." The proportion of practices reporting that they used this approach to support continuity increased from 42 percent in 2012 to 61 percent in 2014, 71 percent in 2015, and 73 percent in 2016. Similarly, the percentage of practices reporting that patients usually see their own provider or practice team rose from 65 percent in 2012, to 75 percent in 2014 and 2015, and 83 percent in 2016.

To improve continuity of care, deep-dive practices continued to emphasize scheduling patients with their usual clinician and care team. A few deep-dive practices emphasized educating patients about who was on their care teams, so patients would know that if they interacted with a member of their physician's team, that team member would keep their usual physician informed of their care. Practices also encouraged patients to request their usual clinician when scheduling visits.

5.4.3. Milestone 4: Patient experience

Similar to PY2015, Milestone 4 required in PY2016 that practices do at least one of the following: (1) conduct a monthly practice-based patient survey, (2) convene a PFAC quarterly, or (3) conduct regular surveys and convene a PFAC periodically. Practices were also required to specify changes to the practice that were due to, or influenced by, the practice survey or PFAC activities, and to continue communicating to patients the changes the practice is implementing due to the survey or PFAC.

a. Overview of findings

In the final year of the initiative, responses to the practice survey show that a majority of practices continued to value the patient feedback provided by surveys or PFACs. In 2015 and 2016, 63 percent of CPC practices considered feedback from these sources "very important" to improving the care they provided to patients, an increase from 54 percent in 2014. (This survey item was not asked in 2012.) Milestone data indicated that 80 percent of CPC practices used patient surveys and 48 percent convened a PFAC (28 percent of practices chose to use surveys and convene PFACs) in 2016. Although the use of surveys was more common, the use of PFACs increased more over the initiative. The percentage of practices that reported use of PFACs increased from 20 percent in 2013 to 48 percent in 2016, with many practices that originally chose to use surveys deciding to also convene a PFAC. Both methods of gathering patient feedback reportedly yielded useful information to guide practice improvements. However, some deep-dive practices noted challenges with conducting patient surveys and several respondents expressed that implementing surveys was burdensome in a busy practice. In addition, some practices had concerns that the same patients were surveyed multiple times, which might lead to less useful information for guiding practice improvement. Although practices typically found it challenging to maintain PFAC participation, they considered feedback from PFAC meetings more useful than survey data because the councils provided opportunities for meaningful conversations between patients and practice members about the patients' experience of care, which generated information that could improve practice operations.

b. Detailed findings

In 2016, about half of CPC practices relied solely on patient surveys to gather input on patient experiences, roughly 30 percent used both surveys and a PFAC, and 20 percent used only a PFAC (Table 5.14). The proportion of practices that reported using a PFAC, either alone or with a patient survey, to elicit patient experiences increased from 20 percent in 2013 to 42 percent in 2014, 47 percent in 2015, and 48 percent in 2016.

Table 5.14. Percentage of CPC practices choosing various options to elicit patient experiences, CPC-wide and by region

Activities to elicit patient experiences	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Practice-based survey only	52%	63%	15%	75%	41%	79%	62%	33%
Both survey and PFAC	28%	14%	52%	15%	41%	14%	28%	27%
PFAC only	20%	23%	33%	9%	17%	7%	10%	41%
Number of practices	437	57	67	53	63	73	60	64

Source: Mathematica analysis of PY2016 Q1 Milestone submission results provided by CMS.

Note: Percentages for all regions are based on 437 practices that submitted Milestone data for this item for the first quarter of 2016.

PFAC = Patient and Family Advisory Council.

Milestone data for 2016 indicate that practices most often used feedback from patients to make improvements in three areas: (1) customer service (63 percent); (2) scheduling, hours, and appointment types (45 percent); and (3) communication with patients (41 percent) (Table 5.15). CPC practices reported finding collecting and using patient feedback more important over time. In the 2016 practice survey, 63 percent of CPC practices reported it was “very important” and 33 percent indicated it was “somewhat important” to improving the care they provide to patients, changed from 54 and 42 percent, respectively, in 2014.

Table 5.15. Percentage of CPC practices indicating that a survey or PFAC influenced various practice changes, in PY2016, CPC-wide and by region

Type of practice change influenced by the survey or PFAC	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Improving customer service	63%	58%	62%	60%	39%	69%	75%	75%
Changes to scheduling, hours, appointment types	45%	30%	45%	40%	39%	63%	62%	30%
Improving communication with patients (e.g., newsletters, signage)	41%	38%	48%	28%	48%	33%	47%	45%
Improving patient portal access and usability	35%	42%	27%	47%	24%	45%	23%	34%
Reducing wait times to get an appointment	32%	26%	24%	43%	32%	40%	38%	22%
Changes to front office staffing and waiting areas	29%	28%	27%	28%	13%	45%	18%	36%
Follow-up from ED visits	27%	28%	11%	23%	11%	60%	35%	16%
Strategies to improve continuity of care and relationship between patients and providers/care team	23%	8%	29%	23%	18%	23%	37%	22%
Transition of care from hospitals and subacute care	23%	21%	6%	15%	11%	43%	50%	14%
Tracking and follow-up from hospitals and diagnostic studies	21%	21%	5%	21%	10%	51%	28%	9%
Streamlining forms to reduce patient burden	18%	11%	26%	19%	13%	17%	17%	20%
Coordination of care with specialists	17%	23%	5%	25%	11%	9%	42%	13%
Changes to self-management support strategies	15%	4%	6%	6%	19%	33%	15%	16%

Table 5.15 *(continued)*

Type of practice change influenced by the survey or PFAC	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Coordination of care with mental health and behavioral health providers	15%	19%	8%	6%	13%	11%	40%	13%
Using community-based self-management support and wellness resources	13%	11%	5%	8%	2%	31%	25%	5%
Changes in the development or use of the plan of care for patients at high risk	8%	8%	3%	11%	16%	5%	8%	8%
Changes to medication management strategies	8%	9%	5%	11%	6%	15%	8%	3%
Refinements to risk-stratification methodology	4%	2%	2%	4%	3%	1%	13%	2%
Other	21%	11%	48%	17%	5%	31%	3%	27%
Number of practices	433	53	66	53	62	75	60	64

Source: Mathematica analysis of PY2016 Q4 Milestone submission results provided by CMS.

Note: Percentages for all regions are based on 433 practices that submitted Milestone data for this item for the last quarter of 2016. Practices could select all changes that apply.

PFAC = Patient and Family Advisory Council.

b.1. Patient surveys

Deep-dive practices used various strategies to conduct patient surveys. Practices used paper-based surveys, web-based surveys, or a combination of both. They asked patients to either take the survey during or immediately after office visits (on paper or on a tablet computer), or complete it at home and submit it through the patient portal or by mail. Some practices surveyed only patients who came in for an office visit, whereas other practices surveyed a sample of their entire patient panel. Several practices reported using patient surveys from third parties, such as CAHPS or Press Ganey, whereas others developed their own surveys. Practices mainly reported distributing surveys monthly or quarterly, although at the time of our 2016 interviews, some practices were not following any set distribution schedule and a few had temporarily discontinued the surveys. Practices' reasons for discontinuing the survey included staff prioritizing other tasks, and challenges getting a sufficiently wide range of patients to respond to the survey. For example, practices noted that the same patients would respond to the survey repeatedly.

Several respondents in deep-dive practices reported challenges with conducting patient surveys and analyzing the results, indicating results were unreliable or not useful for making practice improvements. Some deep-dive practices found it challenging to incorporate distribution of surveys into practice workflows because "it is just one extra thing to do" in a busy workday. Respondents in a few practices also noted that some patients found the surveys confusing. One practice described the situation where some patients seemed confused about the response scale, selecting a "1" on all questions, which is the worst score possible, but also providing glowing reviews, such as "this doctor is the best ever." Several respondents expressed concern about potential quality issues with the survey sample. For example, since surveys typically are anonymous and respondents are not tracked, practices may unknowingly survey the same patients multiple times and the findings may not adequately represent the views of the practice's overall patient panel. Moreover, several respondents in practices that analyzed the survey results themselves (rather than contracting with a third party) found the analysis to be a burden on practice staff. In practices that contracted with third parties to analyze their surveys, some respondents perceived that findings from the survey were not worth the cost of the analysis. However, a few respondents noted that survey results about specific clinicians or staff were more informative than practice-level results for making practice improvements. For example, survey findings from patients at one practice identified clinicians with long wait times, allowing the practice to allocate more staff at various points in the clinic workflow to reduce wait times. At another practice, patients identified which practice staff provided good or poor customer service, allowing the practice manager to work with staff individually to improve patient satisfaction scores.

b.2. Patient and family advisory councils

Deep-dive practices initially relied on surveys to gather patient feedback, but increased their use of PFACs over time. Deep-dive practices found PFACs more useful as time progressed, but continued to use surveys more than PFACs. The format and composition of PFACs varied across deep-dive practices, but did not change substantially over time; PFACs tended to include practice managers and patients who were most commonly recruited by practice clinician or staff nomination.

Several deep-dive practices faced challenges engaging patients to attend PFAC meetings. Practices cited two reasons in particular for this challenge. First, as in prior years, respondents noted that PFAC meetings held during business hours were difficult for some patients to attend, so they did not capture the diversity of the practice's patient population. Evening and weekend PFACs were also hard to schedule because they required extra time from practice staff who had responsibilities at home. Second, a few respondents noted that patients expressed doubt that attending a PFAC meeting would influence the practice. To overcome this challenge, practices attempted to reassure PFAC members that the practice was acting on their feedback by ensuring multiple practice staff and clinicians attended the meetings or by sharing with patients the improvements that resulted from PFAC feedback.

Several deep-dive practice respondents found PFACs effective in generating information to guide practice improvements. They noted that PFACs facilitated meaningful conversations between patients and practice members that produced in-depth information about the patients' experience of care. Respondents reported that the PFACs' suggestions led to practice improvements around patient outcomes, patient satisfaction, and patient education. For example, one PFAC suggested nurses use text messaging to solicit blood sugar levels from patients with diabetes and then track the levels over time, which respondents said resulted in reduced blood sugar levels among almost half of their patients. Other practices reported that PFACs suggested strategies to improve patient satisfaction, such as creating a welcome packet for new patients, helping practice staff interpret results of patient satisfaction surveys, and revising complex language in written communication with patients to make it easier to understand. In addition, PFACs worked with patients to revise intake forms and health risk assessments. Deep-dive practices also reported increasingly using the feedback from PFACs to improve practice operations. For example, some practices shared

> "(PFACs have) been valuable to give us a different perspective that we didn't think about. You'd think with all the brains that we have here [in the practice] that we would think of those things, but we don't."
> –*Care manager*

feedback at practice meetings to discuss how to make improvements, or had leaders or QI coaches meet with clinicians and staff to discuss feedback. A small qualitative study of 10 PFAC patient participants in 2015 found that patients most often raised access-related topics, such as getting timely appointments, reducing wait times in the office, and ensuring that patients were greeted in a timely and welcoming manner (Peikes et al. 2016c).

A few deep-dive practices reported communicating changes to patients that resulted from PFAC feedback or surveys (a Milestone requirement). These practices communicated changes by posting updates in the waiting room and sharing updates during PFAC meetings. One practice planned to communicate changes through an electronic newsletter available through the patient portal, but had not implemented it. One practice shared proposed or implemented changes with the PFAC to solicit additional feedback on them. Respondents from this practice noted that the feedback loop could take six months or more, but ultimately enhanced the practice's ability to improve patient satisfaction and experience.

5.4.4. Milestone 5: Use data to guide quality improvement

Requirements for Milestone 5 became more demanding over the course of the initiative; for example, the number of eCQM measures for which practices were required to perform continuous QI using eCQM data increased from one to three. However, requirements were the same in PY2016 and PY2015. To meet the Milestone requirements, practices were required to (1) perform continuous QI using EHR data in at least three areas, measured by eCQMs; and (2) identify a high-cost or high-utilization area from payer feedback reports, or an aggregated report where available, and develop a strategy to reduce cost or utilization in this area.

a. Overview of findings

Findings from across data sources suggest that QI was a major focus for CPC practices, with more staff sharing responsibility for QI activities over time; however, similar changes occurred in the comparison practices. In the 2016 clinician survey, about two-thirds of physician respondents in CPC and comparison practices reported that they systematically use data from their practice to improve care quality (Appendix E, Table E.63). The percentages of CPC and comparison practices reporting that they used practice staff and teamwork, rather than a centralized committee or department, for QI activities were also similar in 2016. CPC practices reported increased engagement of patients and families over time. Physicians in CPC and comparison practices provided similar responses for many measures of using data to guide improvement. However, physicians in CPC practices were more likely than those in comparison practices to report that their practices actively seek new ways to improve how they do things, and to indicate that staff and clinicians are involved in developing QI plans. Deep-dive practices continued to note that the timeliness and actionability of Medicare feedback reports were barriers to using the reports to monitor changes in cost and utilization resulting from QI efforts (for detailed discussion of data feedback, see Chapter 3).

b. Detailed findings

b.1. Quality improvement and eCQM reporting

For Milestone 5 in PY2016, practices had to report eCQMs, and choose three measures on which to focus their QI activities. According to PY2016 Quarter 4 Milestone data, the most common eCQMs that CPC practices selected for QI efforts were (1) hemoglobin A1c poor control for diabetes, (2) colorectal cancer screening, and (3) breast cancer screening (Table 5.16). These eCQMs were also the most common measures practices selected in 2015, and are similar to those selected in 2014 (when controlling high blood pressure was in the top three, and breast cancer screening was number four).

Table 5.16. Percentages of eCQMs that CPC practices selected for quality improvement activities, in PY2016, CPC-wide and by region

eCQM	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Hemoglobin A1c poor control for diabetes	83%	75%	93%	72%	87%	73%	82%	94%
Colorectal cancer screening	79%	81%	75%	89%	60%	96%	63%	89%
Breast cancer screening	73%	68%	60%	83%	44%	91%	77%	86%
Controlling high blood pressure	69%	82%	64%	79%	83%	40%	57%	84%
Influenza immunization	44%	42%	31%	60%	56%	47%	33%	41%
Tobacco use: screening and cessation intervention	51%	63%	49%	60%	44%	35%	28%	78%
Pneumonia vaccination status for older adults	43%	46%	33%	72%	25%	47%	25%	55%
Diabetes LDL management	41%	42%	54%	34%	54%	5%	32%	69%
Falls: screening for future fall risk	37%	51%	55%	40%	27%	25%	10%	52%
Screening for clinical depression and follow-up plan	35%	44%	42%	45%	10%	32%	10%	66%
Documentation of current medications in the medical record	36%	49%	25%	43%	38%	19%	20%	63%
Ischemic vascular disease: complete lipid panel and LDL control	25%	23%	21%	4%	22%	40%	3%	55%
Heart failure: beta-blocker therapy for left ventricular systolic dysfunction	11%	21%	1%	4%	0%	4%	8%	38%
Number of practices	439	57	67	53	63	75	60	64

Source: Mathematica analysis of PY2016 Q4 Milestone submission results provided by CMS.

Note: Percentages for all regions are based on 439 practices that submitted Milestone data for this item for the last quarter of 2016. Because practices had to identify at least three eCQMs, these percentages are not mutually exclusive.

eCQM = electronic clinical quality measure; LDL = low density lipoprotein.

b.2. Staffing, resources, and processes for quality improvement

Practice-level clinical and administrative leaders most often generated and implemented QI ideas, but were often working alongside others in the primary care practice, at the system level, and patients. Specifically, 92 percent of CPC practices reported in their 2016 Milestone data that practice clinical and administrative leadership were primarily generating improvement ideas and opportunities. They were commonly joined by staff members (68 percent of practices) and system-level leadership (66 percent of practices), and slightly less commonly by designated QI teams or patients and caregivers (49 percent and 40 percent of practices, respectively) (Table 5.17). This varied by region. Whereas 49 percent of all CPC practices reported using designated QI teams to generate improvement ideas and opportunities, 76 percent of CPC practices in Colorado and 65 percent of CPC practices in New York indicated using this approach. Similarly, whereas 40 percent of all CPC practices indicated that patients and caregivers were primarily generating improvement ideas and opportunities, 63 percent of practices in Oregon indicated this was the case for their practice.[57]

The 2016 clinician and staff survey provided more details on the members of the practice that participated in QI activities. Similar proportions (about 30 percent) of nurse practitioners/physician assistants and staff in CPC practices reported frequently participating in QI activities at the practice in a typical week—while a much higher proportion (62 percent) of CPC practice managers reported doing so (Appendix E, Table E.48).

Teamwork in QI became more common during CPC, including meaningful involvement of patients and families. In earlier years of CPC, deep-dive practices indicated that teamwork was needed to meet eCQM requirements and improve care processes. By the final year of the initiative, the percentage of CPC practices that reported “all staff shared responsibility for conducting QI activities” had increased from 15 percent in 2012 to 49 percent in 2016 (and was considerably higher than the 38 percent of comparison practices that reported this in 2016). In addition, the number of CPC practices that involved patients and families in QI grew over the course of the initiative: the percentage of CPC practices that reported “QI activities were conducted by practice teams supported by QI infrastructure with meaningful involvement of patients and families” increased from 5 percent in 2012 to 32 percent in 2016 (28 percent of comparison practices reported this in 2016) (Appendix D, Table D.8a).

Most practices shared panel-level results for specific care teams or providers openly with providers and practice staff. Almost all practices reported that they tracked and measured progress on QI projects, with nearly equal numbers of practices (43 percent and 41 percent) doing so monthly or quarterly, and only 14 percent doing so on an ad hoc basis (Table 5.17).

---

[57] Despite the word “primarily” in the question, practices could check all that apply.

Table 5.17. Percentages of CPC practice staff who generate and implement QI ideas and review data, and intervals for tracking measures and progress, in PY2016, CPC-wide and by region

	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Roles of individuals who primarily generate QI ideas and opportunities:								
Clinical and administrative leadership at the practice level	92%	87%	92%	94%	82%	93%	98%	95%
Staff members	68%	51%	73%	64%	60%	80%	55%	86%
Clinical and administrative leadership at the system level	66%	42%	65%	40%	76%	77%	67%	84%
Designated QI team	49%	30%	76%	23%	65%	49%	33%	58%
Patients/caregivers	40%	25%	39%	45%	34%	19%	57%	63%
N/A or in planning	0%	0%	0%	0%	0%	0%	0%	0%
Practice staff who had implemented QI projects or tests of change over the last two quarters:								
Clinical and administrative leadership	91%	81%	89%	96%	85%	91%	95%	97%
Staff members	60%	60%	70%	64%	34%	57%	58%	78%
Designated QI team	52%	32%	74%	30%	56%	49%	53%	63%
Patients/caregivers	8%	6%	17%	11%	6%	9%	0%	8%
N/A or in planning	1%	2%	0%	0%	5%	0%	0%	0%
Sharing of QI data and results:								
Panel-level results with the care team or providers identified are shared openly within the clinic for providers and staff only	77%	68%	79%	66%	66%	92%	92%	72%
Panel-level results with the care team or providers identified are shared openly within the clinic for providers and staff, as well as patients and families	11%	11%	9%	17%	21%	8%	2%	13%
Results are provided to care team or providers without identifying the applicable provider or care team	6%	9%	9%	11%	6%	0%	3%	5%
Results are reviewed by designated QI team or staff member but not shared with individual providers or care team	4%	6%	3%	0%	6%	0%	0%	11%
We do not routinely review or share QI data and results	2%	6%	0%	6%	0%	0%	3%	0%
Practice routinely tracks and measures progress on QI projects:								
At least monthly	43%	23%	70%	36%	15%	55%	33%	64%
At least quarterly	41%	47%	26%	51%	73%	36%	52%	9%
Only as needed or ad hoc	14%	26%	5%	11%	11%	8%	13%	25%
We do not routinely track and measure progress on QI projects	2%	4%	0%	2%	2%	1%	2%	2%
Number of practices	433	53	66	53	62	75	60	64

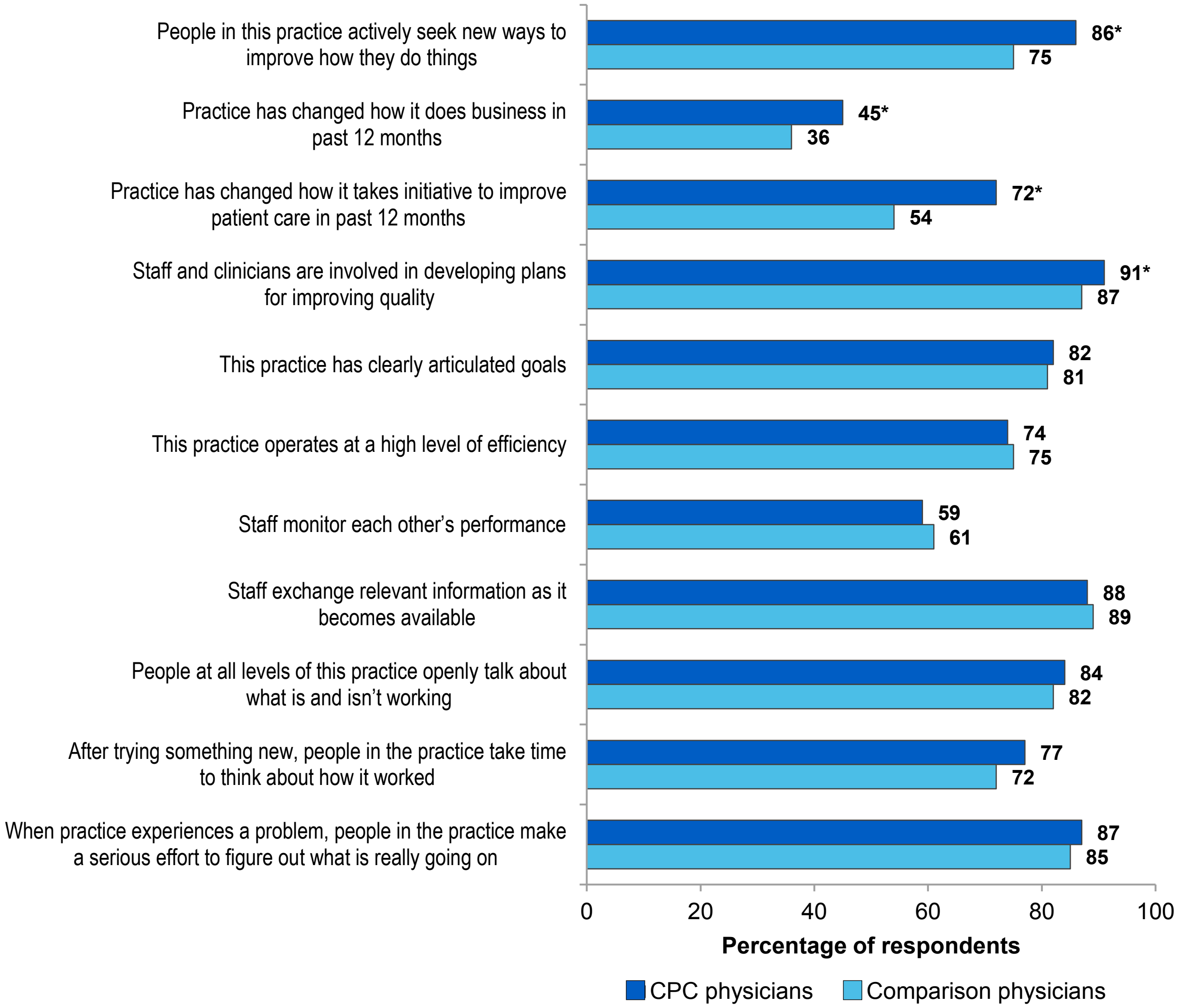
Source: Mathematica analysis of PY2016 Q4 Milestone submission results provided by CMS.

Note: Percentages for all regions are based on 433 practices that submitted Milestone data for this item for the last quarter of 2016. Practices could select all that apply for the first two questions addressed in the table; they selected one option for the last two questions addressed in the table.

QI = quality improvement.

Physicians in CPC practices were more likely than physicians in comparison practices to report that their practice actively seeks new ways to improve how they do things. In the 2016 clinician survey, physicians in CPC practices were also more likely than those in comparison practices to report that the practice has changed how it takes initiative to improve patient care in the last 12 months (Figure 5.5). However, similar proportions of primary care physician respondents in CPC and comparison practices reported personally using data from their practice to improve care quality in a systematic way. For many measures of the use of data to guide improvement, physicians in CPC and comparison practices provided similar responses.

Figure 5.5. Percentages of physicians who agree or strongly agree with statements about quality improvement, CPC and comparison practices, 2016



Source: CPC Clinician and Staff Survey, conducted June–November 2016.

*/**/*** Response distributions for this question are significantly different between CPC and comparison respondents at the 0.10/0.05/0.01 level.

Deep-dive practices typically used ad hoc approaches for practice-level QI. Similar to past years, most deep-dive practices, regardless of size or ownership, reported using ad hoc approaches to QI and several reported no clear process for QI beyond choosing quality and utilization targets to monitor.

Autonomy for change and centralization of QI approaches varied for small independent versus large and system-owned practices. Small independent practices had more autonomy to change workflows and tasks of various staff and noted that this enabled them to make rapid changes to improve quality. More formal QI efforts tended to occur in large and system-owned practices and relied on centralized approaches to drive practice-level change. Formal or systematic approaches to QI typically involved holding regular team meetings to identify QI targets, plan work process changes, and track progress. Deep-dive practices with practice-level QI teams reported providing progress updates and reminders to other staff members about ongoing QI projects. In a few of these practices, the QI team shared these reports electronically throughout the practice and discussed them at regular practice meetings.

Dedicated staff and support for analyzing and interpreting data facilitated QI efforts. In past years, deep-dive practices noted that tracking eCQMs helped them organize and maintain a focus on QI, but that reporting requirements for this Milestone are time consuming and resource intensive. In 2016, respondents in some deep-dive practices reported they now have access to staff (in the practice or at a central location for system-owned practices) who assist with analyzing and interpreting quality measures data. Having dedicated staff has helped practices to regularly monitor QI progress, identify new areas for QI work, and generate clinician-level performance reports. By comparing clinician-level performance data, some practices were able to identify successful strategies and implement them throughout the practice. As in previous years, some deep-dive practices that were part of larger systems had CPC project managers who worked across all system-affiliated practices to standardize and support practice-level improvements using formal QI methods (such as plan-do-study-act cycles). For non-system affiliated practices, expanding the QI team and focusing on teamwork were particularly important for successful QI. These practices described the importance of the care manager's role in helping practices stay focused on QI efforts, and the need for practice meetings and other opportunities to share QI information (for example, posting materials on the practice intranet site or in common areas).

> "Now with having so much data available through our EHR … we actually created a position where we have a data analyst who is able to run reports on different quality measures and get that report out to our physicians monthly."
>
> –*Medical director in a physician group*

b.3. Data feedback reports

In this section, we discuss practices' use of feedback reports for quality improvement. Chapter 3 presents details on the use of feedback reports across regions and practice types and additional discussion about feedback reports. Practice survey data indicate that most CPC practices reviewed Medicare FFS practice-level feedback reports and that a majority regularly reviewed feedback from other payers as well.

> "By the time the CMS report comes … if you're really being proactive … it's kind of a day late and a dollar short."
> *–Clinician lead*

Many deep-dive practices found the data feedback reports from Medicare and other payers useful for identifying potential improvement areas to target but not timely enough to monitor QI changes. As in prior years, the principal reason practices did not use feedback reports to support ongoing QI was that the data were not timely enough to accurately gauge the effects of improvement efforts and support QI. For example, a practice might make a change based on utilization in a feedback report but could not confirm until many months later whether the change had an effect, during which time the practice might have made other changes. A few respondents reported that practice-constructed reports on utilization (such as tracking ED visits) were more useful for supporting QI because they could receive regular updates and get a more current picture of the results.[58]

Throughout CPC, deep-dive practices noted other challenges in using payers' feedback reports to guide QI, including inconsistent access to patient-level data, reports that represent small numbers of patients, and measurement methodologies and reported outcomes that are not aligned across payers. In some regions, the lack of alignment across payer reports meant that practices sometimes received conflicting signals on the same quality measure from different payers, leading staff in some practices to question the accuracy of reports not generated from their own clinical data systems. In 2016, however, deep-dive practices also indicated feedback reports were helpful for comparing their results on hospital readmissions, ED visits, and other metrics to those for all practices within a CPC region (or practices in their region with a similar patient risk profile to theirs). Some practices used the feedback reports to set informal goals to reduce gaps in care or address high utilization for individual patients. For example, a few practices used the patient-level data files included in some payers' feedback reports to identify patients to target for education about appropriate ED use. Similar to findings from previous years, practice members used feedback reports to identify patients who need care management services.

A few deep-dive practices were using Medicare's Specialist Feedback Report and found it useful, but others were unfamiliar with the report or did not find it very useful. In May 2016, CPC practices were given access to a report on use of specialists by Medicare FFS beneficiaries attributed to the practice. The one-time report was designed by CMS and listed for each practice its top five specialists (in terms of costs) within each specialty, the total costs by specialty, and the number of visits by specialty. Deep-dive practices that used the Specialist Feedback Report found it helpful for (1) tracking which specialists their patients were seeing, (2) identifying and working to eliminate unnecessary specialist encounters and procedures, (3) tracking costs and utilization for patients who self-referred to specialists (such as ophthalmologists for cataract surgery), and (4) identifying lower-cost specialists for future patient referrals. Respondents in a few practices said that they downloaded the report but did not find it useful because it was too complex to interpret, contained too much information, or did not include information that would help them assess the quality or value of the specialists' services (for example, one physician wanted more details about services each specialist provided, such as

---

[58] Although many respondents suggested that real-time access to claims data might be more useful than feedback reports, a pilot of claims data sharing conducted with a small number of CPC practices suggests that only some would have the time and resources necessary to clean and analyze claims data.

a cardiologist's rate of echocardiograms or stress tests). Moreover, several deep-dive practices reported they were unfamiliar with or had not reviewed these reports.

5.4.5. Milestone 6. Care coordination across the medical neighborhood

As in PY2015, in PY2016, Milestone 6 required CPC practices to implement two of the following three options: (1) track the percentage of patients with ED visits who received a follow-up phone call from the practice within one week, (2) contact at least 75 percent of patients who were hospitalized in target hospitals within 72 hours or two business days of discharge, or (3) enact care compacts or collaborative agreements with at least two groups of high-volume specialists in different specialties to improve care transitions.

a. Overview of findings

CPC practices made progress from 2012 to 2016 on relevant care coordination tasks as measured by the Milestone data, deep-dive findings, and the practice survey, but they still had opportunities for improvement. In 2016, almost all CPC practices chose to focus on both hospital discharge follow-up and ED follow-up. Findings from the practice survey show that CPC practices were substantially more likely than comparison practices in 2016 (84 versus 54 percent) to report that they routinely followed up with their patients after ED visits or hospitalizations "because of established arrangements with the ED or hospital to track patients" (see Appendix D, Table D.8a). Findings from the deep-dive interviews indicated that many practices refined workflows and strengthened relationships with hospitals during CPC. For example, some practices entered into agreements with hospitals to which they most frequently admitted patients so they could obtain timely discharge data and contact patients promptly.

Deep-dive practices also reported expanding their outreach to patients who are discharged from the hospital or ED. Reflecting the success of outreach efforts, in 2016, patients at CPC practices were more likely than comparison practice patients to report that someone from the provider's office contacted them within three days of their most recent hospital stay (60 versus 50 percent) or within one week of their most recent emergency room or ED visit (59 versus 51 percent).

CPC practices chose care compacts less frequently than the other two options (hospital discharge follow-up and ED follow-up) for Milestone 6; still, 40 percent of CPC practices in 2016 also elected to establish care compacts or collaborative agreements with specialists. And while the use of care compacts with specialists among CPC practices increased each year according to Milestone data, their use was lower in CPC than in comparison practices.

b. Detailed findings

In 2016, almost all CPC practices chose to focus on hospital discharge follow-up and ED follow-up, and 41 percent elected to establish care compacts or collaborative agreements with specialists to help improve care transitions (Table 5.18). Activity varied across regions, with higher percentages of practices in Colorado, New Jersey, and New York (72, 64, and 61 percent) choosing to focus on care compacts, compared to 15 and 17 percent of practices in Ohio/Kentucky and Oklahoma. Practices arranged care compacts or collaborative agreements most often with the following specialist types: cardiology (chosen by 64 percent of practices that had care compacts), gastroenterology (49 percent), orthopedic surgery (43 percent), behavioral health (39 percent), and obstetrics/gynecology (34 percent).

Table 5.18. Percentages of CPC practices that chose CPC's three care coordination activities, in PY2016, CPC-wide and by region

Care coordination activity	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Hospital discharge follow-up	96%	100%	93%	94%	88%	100%	100%	100%
ED follow-up	95%	98%	85%	96%	98%	100%	93%	95%
Care compacts/collaborative agreements with specialists	41%	37%	72%	64%	61%	15%	17%	25%
Number of practices	440	57	67	53	64	75	60	64

Source: Mathematica analysis of PY2016 Q1 Milestone submission results.

Note: Practices could select all activities that applied.

b.1. Hospital and ED follow-up

Milestone, survey, and deep-dive data all indicated that practices expanded follow-up with patients after hospital and ED discharge and strengthened their relationships with hospitals to facilitate this work. Still there was room for improvement.

Developing relationships with hospitals and EDs

Results from the practice survey suggest that practices made considerable progress in developing relationships with hospitals and EDs so practices could follow up with patients, but could continue to improve in this area (see Appendix D, Table D.8a):

- The percentage of CPC practices reporting "following up with patients seen in the ED or hospital routinely because the practice has arrangements with the ED and hospital to track patients and ensure follow-up is completed within a few days" increased from 25 percent in 2012 to 65 percent in 2014, 77 percent in 2015, and 84 percent in 2016. Additionally, a higher proportion of CPC than comparison practices (84 versus 54 percent) reported in 2016 that they conducted routine follow-up with patients seen in EDs or hospitals because of established arrangements with them to track patients and ensure timely follow-up.
- The percentage of CPC practices reporting "consistent receipt of information on patients from community hospitals and EDs within 24 hours after the event" increased from 14 percent in 2012 to 36 percent in 2014, 53 percent in 2015, and 57 percent in 2016. (A lower 36 percent of comparison practices reported this in 2016.)

Over time, deep-dive practices improved their relationships with hospitals and their processes to follow up with patients discharged from the hospital and ED. Some deep-dive practices spent time early on developing relationships with hospitals that led the hospitals to send patient discharge information systematically to the practice (electronically or via fax) by PY2016. These practices attributed their success in gaining access to hospital records during CPC to (1) their efforts to build rapport with hospital leaders, and (2) recent changes in Medicare payment policy that made hospitals more interested in working with primary care providers to reduce readmissions.

However, deep-dive practices' experiences varied considerably with respect to:

- Source and therefore comprehensiveness of the discharge information (in-network hospitals only, out-of-network hospitals, or payers)
- Consistency and timeliness of discharge notification
- Mechanism used to notify practices of the discharge (electronic, fax, or telephone)
- Level of automation in notifying practices of the discharge (automatic receipt of information or manual look-up by practices)
- Level of detail in the discharge notification

Because of these variations, staff in some practices still spent considerable time and resources coordinating the exchange of information between the practice and hospitals. Other practices were unable to obtain hospitals' cooperation, despite repeated requests for records, and some patients did not identify themselves as receiving primary care from the practice.

Practices with electronic access to hospital and ED records could identify and follow up with patients in a timely manner, particularly if they received automatic notifications. These practices benefited from having real-time access to records through a common EHR, hospital portal, or local data-sharing network. Several practices had automatic notification arrangements with a target hospital (including hospitals that were part of their system and hospitals with which they had no affiliation), which relieved staff from regularly checking for available records.

Providing patients with transitional care

Patient survey results corroborate the reports of increased follow-up by practices. Specifically, a higher proportion of Medicare FFS beneficiaries in CPC practices than comparison practices reported receiving follow-up care within three days of a hospital stay (60 versus 50 percent), and within one week of an ED visit (59 versus 51 percent).

In deep-dive practices, a practice member typically telephoned the patient within 48 hours of discharge after hospitalizations and contacted patients within a week of an ED visit. Most often, this outreach was performed by a designated care manager; however, in some practices, other staff members (for example, licensed practical nurses, medical assistants, or the practice manager) were responsible for following up within the required time frame. In several practices, the care manager focused on contacting the highest-risk patients, and other staff members contacted the medium- and low-risk patients.

Across deep-dive practices, staff noted the importance of the care manager in understanding and addressing the needs of high-risk patients who are discharged from the hospital or ED. Respondents noted that these patients sometimes have limited understanding of the hospital care they received or are confused about their medications. Care managers reportedly played an important role in addressing this issue by helping discharged patients reconcile medications between the hospital and outpatient setting and arranging follow-up care, thus minimizing clinicians' involvement in resolving care coordination issues. Care managers also provided other care management services, including connecting patients to needed resources and supports, such as programs providing affordable medications. Respondents in several deep-dive practices felt that access to a care manager also helped patients avoid the ED for non-urgent needs. The care manager encouraged the patient to see the primary care clinician (if needed), helped reduce the patient's anxiety about an issue by telephone (if appropriate), or quickly obtained input from a clinician. A few practices kept lists of frequent ED users, so during ED follow-up, care managers could educate them about appropriate use of the ED and when to call the practice first before going to the ED.

Practices thought their work with patients after care transitions was valuable. Deep-dive practice respondents felt that their care transitions work benefitted patients by preventing things from falling through the cracks (for example, reconciling changes to patients' medications made in the hospital with medications the primary care clinician had previously prescribed for the patients) to avoid medication errors. This care transitions work also ensured that patients understood the discharge information and followed up in a timely fashion with their primary care clinician to help avoid additional ED visits or readmissions.

b.2. Care compacts/collaborative agreements

Although few CPC deep-dive practices focused on care compacts or collaborative agreements with specialists when CPC began, close to half of them were pursuing such agreements by the final year. Care compacts and collaborative agreements outline the respective responsibilities of primary care providers and specialists in caring for patients, and establish a process for reliably exchanging clinical data and communicating about referrals and consultations. Like practices nationwide, CPC practices still have substantial opportunities to improve how they coordinate and exchange information with specialists in their medical neighborhood. At the same time, respondents in deep-dive practices noted that they do not have control over the services ordered by specialists or hospitals, or the FFS incentives that drive providers' behavior.

As in previous years, deep-dive practices typically established agreements with specialists to whom they most frequently referred, with whom they had good relationships, and who were in the same health system and using the same EHR. According to the deep-dive practices, specialists are receptive to these agreements. In most cases, discussing the collaborative agreement in person facilitated the primary care and specialist providers' commitment to it. In one practice, the system-level IT support team worked with staff from primary care and specialist practices to develop EHR functionality to support the agreement.

A few deep-dive practices mentioned challenges to setting up collaborative agreements (such as agreeing on how information should flow between practices). A couple of practices noted that specialists were having difficulty managing different collaborative agreements with multiple referring groups, because the agreements had different communication and coordination requirements. For practices that are part of a system with a system-wide EHR, respondents reported that care compacts were less important because all clinicians within the system can see relevant patient information. Deep-dive practices also reported a lack of engagement from specialists, partly because current FFS payment incentives do not encourage specialists to engage with primary care providers. In addition, data sharing across different EHRs can pose challenges to setting up and carrying out collaborative agreements. Practices pursuing care compacts were still developing them, so deep-dive practices did not report on the extent to which compacts were affecting care delivery.

5.4.6. Milestone 7: Shared decision making

In PY2016, to meet the requirements for Milestone 7, practices were required to use at least three patient decision aids (PDAs) to support shared decision making (SDM) in preference-sensitive care. Practices were required to track the use of the PDAs through (1) a metric tracking the proportion of patients eligible for the decision aid who received the aid, or (2) quarterly counts of patients who received individual aids.

a. Overview of findings

The uptake of SDM was low in the first two years of CPC, perhaps because (as deep-dive interviews suggested) practices did not understand the difference between SDM for preference-sensitive conditions and general patient education, and struggled to identify patients who would benefit from SDM. However, as CPC progressed, practices increased SDM implementation and noted that the quality of care for these preference-sensitive conditions improved because patients were making more informed decisions. Results from interviews with deep-dive practices and the practice survey suggested continued room for improvement in (1) providers' and staff members' understanding of the concept of preference-sensitive conditions, (2) developing care processes to provide SDM without overwhelming clinicians, and (3) tracking the discussion and outcomes of SDM in EHRs. Deep-dive practices that used teamwork to engage patients in SDM found Milestone 7 more manageable, but several deep-dive practices expressed mixed perceptions of the benefit of SDM. Consistent with this, only 37 percent of physicians reported in the clinician survey that using SDM tools was very important to improving the care they provide patients.

b. Detailed findings

b.1. Uptake of SDM

Information from the practice survey sheds some light on CPC practices' uptake of SDM. The percentage of CPC practices that reported that "PDAs were used to help patients and providers jointly decide on treatment options consistently for patients for two or more clinical conditions and tracked with run charts or other measures" increased from 42 percent in 2014 to 56 percent in 2015 and 62 percent in 2016, when it was substantially higher than the 25 percent of comparison practices that reported this. (We did not ask CPC practices about this topic in 2012.) (See Appendix D, Table D.8a.) The proportion of CPC practices reporting that "practice teams trained in decision making techniques systematically supported involving patients in decision making and care" steadily increased from 15 percent in 2012 to 27 percent in 2014, 35 percent in 2015, and 41 percent in 2016 (see Appendix D, Table D.8a). (This approach helps increase the effectiveness of both SDM and care management.) These results indicate improvement over time, as well as room for practices to increase their use of SDM.

b.2. Identifying topics and decision aids for SDM

The top four conditions that practices selected for shared decision making were (1) colorectal cancer screening (66 percent), (2) prostate cancer screening (41 percent), (3) tobacco cessation (32 percent), and (4) mammography (24 percent) (Table 5.19).

Table 5.19. Shared decision making topics chosen by CPC practices as of Quarter 1, PY2016

Shared decision making topic	Percentage of practices
Therapeutic options in management	
Tobacco cessation: choice of approach	32%
Low back pain (acute or chronic)	21%
Care preferences over the life continuum	19%
Osteoporosis management and medication choices	12%
Mild depression	12%
Adult sinusitis	10%
Insomnia	3%
Osteoarthritis of the hip or knee	2%
Chronic pain	1%
Medication choices	
Diabetes management	17%
Statin use	15%
Antibiotic use	8%
Chronic obstructive pulmonary disease management	5%
Hypertension management	5%
Anticoagulation for atrial fibrillation	2%
Asthma management	1%
Congestive heart failure management	1%
Screenings	
Colon cancer screening strategies	66%
Prostate cancer screening	41%
Mammography for patients age 40–49 or over the age of 75	24%
Lung cancer screening	6%
Other	
Depression treatment	5%
Aspirin	2%
Other[a]	14%

Source: Mathematica analysis of PY2016 Q1 Milestone submission results provided by CMS.

Notes: 433 practices reported on their choice of SDM topics. Practices each chose two to five SDM topics.

[a] "Other" includes practices' write-in responses: first trimester genetic screening; abdominal aortic aneurysm screening; ADHD treatment options; cataracts; cholesterol screening and management; fall risk or prevention; vaccinations; knee pain; lead screening; long-acting reversible contraception; management of urinary incontinence; medication options for Crohn's disease and ulcerative colitis; menopause treatment; obesity; "One Key Question"; obstructive sleep apnea; pap smear; substance use; medication for Alzheimer's disease; bunions; cervical cancer screening; other diabetes care; hypertension; managing risks/concerns for older patients; and treating blocked leg arteries. Not all of these are consistent with CMS's definition of a preference-sensitive condition.

Milestone data illustrate that the organizations from which CPC practices commonly obtained PDAs for SDM include the Centers for Disease Control and Prevention, Mayo Clinic, Healthwise, the Agency for Healthcare Research and Quality, and Option Grid, and others (Table 5.20). Given the cost of obtaining access to private PDA libraries, 49 percent of practices obtained free decision aids from sources other than the ones listed in the table and 18 percent used an ad hoc or practice-created tool.

Table 5.20. Sources of decision aids used by CPC practices, PY2016, CPC-wide and by region

Source	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Other	49%	56%	54%	61%	31%	49%	36%	58%
Centers for Disease Control	32%	47%	35%	28%	50%	11%	39%	17%
Mayo Clinic	32%	14%	14%	44%	17%	28%	66%	40%
Healthwise Decision Points	21%	37%	38%	22%	28%	1%	7%	17%
Agency for Healthcare Research and Quality	11%	12%	7%	15%	14%	4%	3%	20%
Option Grid	10%	11%	9%	7%	31%	0%	10%	3%
Ottawa Hospital Research Institute	4%	0%	1%	2%	0%	0%	25%	2%
Health Dialog/Informed Medical Decisions Foundation (Healthwise)	3%	4%	3%	4%	0%	0%	0%	11%
None of the above; we use an ad hoc or practice-created tool	18%	11%	12%	11%	2%	43%	21%	20%
Number of practices	445	57	69	54	64	75	61	65

Source: Mathematica analysis of PY2016 Q1 Milestone submission results provided by CMS.

Note: Percentages for all regions are based on 445 practices that submitted Milestone data for this item for the last quarter of 2016. Practices could indicate multiple sources of decision aids.

Across regions, most CPC practices selected their SDM topics based on the number of patients with a condition or due to the perceived potential impact on quality (71 and 70 percent, respectively) (Table 5.21).

Table 5.21. Reasons for selecting priority shared decision making areas, PY2016, CPC-wide and by region

Reason	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Large number of patients with condition (high volume)	71%	61%	61%	72%	70%	84%	62%	80%
Impact on quality	70%	75%	86%	69%	64%	72%	48%	75%
Potential for significant cost associated with care (low-volume, high-cost area)	43%	32%	39%	46%	45%	64%	33%	40%
Significant impact on cost for patient	26%	30%	41%	24%	11%	41%	7%	22%
Other	15%	5%	12%	9%	17%	31%	23%	3%
Number of practices	445	57	69	54	64	75	61	65

Source: Mathematica analysis of PY2016 Q1 Milestone submission results provided by CMS.

Note: Percentages for all regions are based on 445 practices that submitted Milestone data for this item for the first quarter of 2016. Practices could indicate multiple reasons.

b.3. Identifying patients for SDM

Milestone data illustrate that practices most commonly reported identifying patients as eligible for shared decision making through a provider or care team referral (59 percent) or a routine established protocol (57 percent) (Table 5.22). Only 19 percent of CPC practices had no established process or protocol and were identifying patients on an ad hoc basis.

As deep-dive practices began implementing this Milestone, some struggled with identifying and reaching out to patients for particular SDM topics. Some practices initially took a population-based approach to identifying appropriate patients (for example, all patients age 50 and older due for colorectal cancer screening) and sent out mailings, with little response from patients. Practices also tried targeting more narrowly defined patient subgroups (such as those older than age 50 with an appointment scheduled in the next few months). Qualitatively, they noted that more intensive personal outreach to the targeted patients seemed to better engage patients. Other practices addressed the need for SDM on a case-by-case basis during patient visits.

Deep-dive practices varied in the timing of raising SDM with patients. Most deep-dive practices raised SDM topics during both routine and acute visits when appropriate. A couple of practices raised sensitive topics (such as advanced directives) during the annual wellness visit, when patients were not having acute symptoms and could focus on the discussion. A few also used population-based outreach between visits, such as mass mailings to patients age 50 and older who had not had colorectal cancer screening. (However, as discussed more above, some practices that had tried this approach felt that too few patients called to make appointments to discuss screening.)

Several clinicians in deep-dive practices stated that some patients did not want to engage in SDM. Practices perceived that some patients did not take the time to review PDAs, particularly when they covered “uncomfortable topics” such as end-of-life care or when patients held a more traditional view of health care, preferring to rely on the provider’s recommendation for decisions about treatment options. A few practices focusing on PSA screening reported that some of their patients felt the tool was an effort by insurance companies to save money.

b.4. Documenting use of decision aids

According to Milestone data, 90 percent of CPC practices documented distributing decision aids in their EHR, but only 1 percent reported documenting it in a care plan or after visit summary.

Table 5.22. Identification of eligible patients for shared decision making and documentation of shared decision making, CPC-wide and by region

Method of identification or documentation	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Patients are identified as eligible for preference-sensitive care using:								
Provider or care team referral, based on clinical intuition	59%	43%	59%	62%	56%	72%	57%	56%
Routinely identified based on established protocols for each preference-sensitive condition	57%	53%	67%	70%	71%	52%	28%	58%
Automatic flags built into EHR	25%	23%	20%	40%	11%	35%	17%	27%
Ad hoc basis or referral-based only, no established process or protocol	19%	25%	17%	11%	8%	27%	37%	6%
Other	7%	9%	3%	6%	2%	0%	25%	3%
Distribution of decision aids is documented in:								
EHR	90%	91%	82%	89%	100%	99%	73%	97%
Care plan	1%	2%	0%	2%	0%	0%	0%	0%
After visit summary	1%	2%	0%	4%	0%	0%	0%	0%
Other	9%	6%	18%	6%	0%	1%	27%	3%
Number of practices	433	53	66	53	62	75	60	64

Source: Mathematica analysis of PY2016 Q4 Milestone submission results provided by CMS.

Consistently documenting SDM discussions and decisions in the EHR was a challenge for clinicians and staff in deep-dive practices throughout CPC. After identifying a workflow for SDM, practices had to figure out how to document that discussion and find an appropriate place to record it in the EHR for general tracking and CPC reporting. In many practices, clinicians reported they did not have the time (or they simply forgot) to check the structured SDM fields in the EHR, but they instead documented this information in the free-text portion of the EHR note. In a few deep-dive practices, clinicians continued to document SDM discussions with patients on paper, and then staff entered the information into the EHR. In some practices, staff turnover added to the difficulty, including training new staff to document SDM. As a result, most of these practices perceived that SDM was underreported at their practice. As one practice lead noted, "That has been the hardest Milestone to incorporate into our usual workflow."

> "You can't just talk to somebody about quitting smoking; you've got to show it [in the EHR in] four different spots, so that the government can see it anytime that they want...Every time we come up with something new, it takes my nurse another five minutes. People [who are] not working [in the clinical setting] don't think that five more clicks is a big deal, but when you're seeing patients every day and every patient has five more clicks, it's a big deal…That's where the biggest issue is…and we're paperless."
>
> —*Lead physician*

b.5. Additional facilitators of and challenges with SDM

Deep-dive practices' prior experience with using SDM tools facilitated early success. For example, one practice had developed an infrastructure for incorporating the use of SDM tools into practice processes. This practice used a registry to automatically prompt medical assistants to give eligible patients colon cancer screening information during intake. Patients had time to review the information before they saw the clinician, who would discuss the screening decision with the patient. After the clinical encounter, the clinician used a template in the EHR to order the patient's preferred mode of colon cancer screening or to indicate that the patient declined screening. Practice members reported that this process had increased the number of colonoscopies ordered and improved documentation of colon cancer screening.

Involving multiple care team members in engaging patients in SDM was a key facilitator for this Milestone among deep-dive practices. Respondents in a few practices reported that they recently changed workflows for topics that were more clinically complicated (such as imaging for low back pain) or sensitive (such as end-of-life planning) to enable clinicians to introduce and discuss the PDAs with patients, rather than having another staff member raise the topic with the patient. Clinicians and staff perceived that SDM on clinically complex or sensitive topics required clinical judgment or that decisions on more sensitive topics (such as advanced directives) were more effective when discussed by the clinician. However, for other topics, practices found it more efficient for medical assistants or front desk staff to introduce PDAs to patients at the beginning of the office visit; the clinician then reiterated the PDA information during the visit. In practices with less of a team approach, clinicians responsible for handling SDM by themselves tended to feel the work was onerous.

As CPC progressed, deep-dive practices noted that the quality of patient care improved when patients were more informed. Several respondents noted that patients know best which goals and treatments are the most realistic for their lifestyles, so SDM appropriately increased patients' involvement in decisions about their care. Several respondents also commented that, as a result of SDM, the practice gave more information to patients—about overdue colorectal cancer screening, unnecessary x-rays and MRIs, tobacco cessation, advanced directives and other end-of-life planning, and more. Moreover, several respondents perceived that the SDM resources patients received were more beneficial than the informal conversations that took place before implementing SDM. For example, one practice's end-of-life PDA allowed patients to complete a living will with the help of practice staff; before CPC, the discussion might have ended without a follow-up action.

Even in the final year of CPC, some deep-dive practices did not understand how shared decision making differed from general patient education, and they noted a need for more training on SDM. A number of deep-dive practices reported that they did not understand the concept of SDM for preference-sensitive conditions. Capturing the sentiment of some respondents, one CPC coordinator for a health system noted that providers "do not seem to fully understand the concept" of SDM as defined by CPC. A major area of confusion was understanding the difference between (1) general patient education for conditions for which treatment options have a strong evidence base (for example, management of hypertension, immunizations) and (2) preference-sensitive conditions for which different management options exist and the patient's preference should play a greater role in determining which treatment to pursue. This confusion contributed to lower levels of support among staff. In addition, several deep-dive respondents commented that the emphasis on using PDAs ignored the larger problem of clinicians not consistently receiving training on the value of SDM or the techniques needed to support it. Without this training, some clinicians struggled with effectively using PDAs to engage patients in decisions about their care.

5.4.7. Milestone 8: Participation in the CPC learning collaborative

To fulfill the requirements for Milestone 8 for PY2016, practices were required to participate in all regional learning sessions and engage with the regional learning faculty (RLF) to facilitate transformation efforts. Chapter 3 provides an in-depth examination of regional and national learning activities offered in PY2016 and CPC practice perspectives on these activities.

5.4.8. Milestone 9: Health IT

As in PY2015, to meet the requirements of Milestone 9 in PY2016, practices had to attest that all eligible professionals engaged with, or were working toward, meeting Stage 2 Meaningful Use requirements, which focus on supporting advanced clinical processes, following timelines established by the EHR Incentive Program.[59] Milestone 9 optimizes use of the EHR to support better care and improved health outcomes. For PY2016, CMS suggested various strategies that practices could employ to accomplish this objective. These included, but were not limited to (1) modifying workflows for more effective EHR use, (2) training staff in optimal EHR use, (3) using referral templates and other standardized documents to support health information exchange, (4) building analytic capacity to use EHRs to identify improvement opportunities, and (5) improving entry of clinical data to ensure accurate quality monitoring and reporting. We include many findings about health IT as a tool to support specific Milestones in earlier sections on those Milestones. Specifically, in discussions of Milestones 2, 6, and 7, health IT challenges affected care plan use and care management activities as well as practices' ability to follow up in a timely way with patients who had been hospitalized or used the ED, and limited practices' ability to effectively track the outcomes of SDM discussions in EHRs. This section focuses on cross-cutting issues with health IT *across* Milestone activities.

a. Overview of findings

As required by CPC, practices used the Office of the National Coordinator for Health Information Technology (ONC)-certified EHRs, and all CPC practices attested that their eligible providers are working toward meeting the Stage 2 requirements for Meaningful Use. However, triangulation of data from Milestone reporting, the practice surveys, and the deep-dive practices underscores challenges that practices face obtaining and exchanging timely data from providers outside their practice or system. This issue, which practices nationwide face, continues to pose a barrier for CPC practices in improving follow-up care after ED visits and hospitalizations, and coordinating care for patients after their visits to specialists (see Milestone 6 above).

b. Detailed findings

According to Milestone 9 data from the last quarter of PY2016, 100 percent of CPC practices attested that all eligible providers are currently working toward meeting the Stage 2 requirements for Meaningful Use.

b.1. Use of health IT

In the 2016 practice survey, all CPC practices and 99 percent of comparison practices reported having an "electronic health record system for managing patient care." More than 98

---

[59] For information about Stage 2 of the Meaningful Use Program, see https://www.cms.gov/regulations-and-guidance/legislation/ehrincentiveprograms/downloads/stage2_guide_eps_9_23_13.pdf.

percent of both groups also reported using the EHR's e-prescribing function. Ninety-seven percent of CPC practices reported using EHR-generated data extracts or reports to guide QI efforts, compared to 83 percent of comparison practices. In both groups, more than half of practices reported that practice managers were responsible for reviewing EHR reports (57 percent of CPC practices and 56 percent of comparison practices). These results for CPC and comparison practices have been relatively consistent in practice surveys conducted in 2014, 2015, and 2016.

The 2014 and 2016 rounds of the clinician survey confirmed that nearly all CPC and comparison practices are using EHRs. However, in both rounds, responses from physicians in CPC and comparison practices indicated room for increased use of their EHRs, for example, to track communications with other providers and to review images and test results. Survey responses also point to the need for EHRs to better support the ability of clinicians and staff to provide high quality care for patients. For example, in 2016, 11 to 34 percent of physicians in both CPC and comparison practices reported disagreeing or strongly disagreeing with statements that their EHR helps them in providing quality care to patients, reminds them of key actions when seeing a patient, and is well integrated into the practice's workflow, and that they trust the validity of data in the EHR.

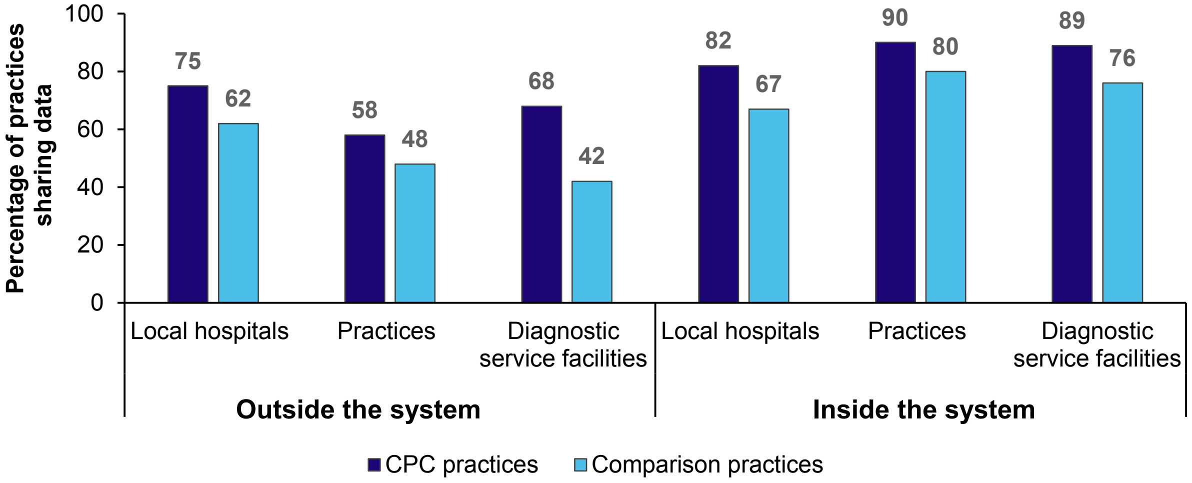
As in previous years, deep-dive practices continued to work toward improving the way they used EHRs to better meet CPC Milestones. In 2016, a couple of practices reported ongoing efforts to improve tracking and reporting quality measures, such as care gaps in colorectal cancer screenings and immunizations. Other practices reported establishing new and more efficient approaches to risk-stratification in the EHR, developing better documentation templates for care management, and setting up better electronic communication with other clinics. Over the course of CPC, practices have worked to standardize and ensure consistent data entry into structured fields in the EHR to facilitate reporting clinical quality measures and to guide QI. To better meet CPC Milestones, a few practices also reported making significant EHR investments, including engaging EHR vendors for software support. A couple of practices were holding off on further EHR improvements related to CPC until the practice implemented a new EHR planned for the coming year.

> "If you don't get a Cadillac-y EHR system, life is very difficult…if you don't spend the money [on the] system, it just makes life very challenging for reporting, and for documenting."
> –*Practice manager*

b.2. Data sharing

Reflecting the state of health information exchange in the United States, there is still room for improvement in how data are shared between CPC practices and other providers. Within both CPC and comparison practices, data sharing—defined as either sharing read-only data or importing or exchanging data—was more common among providers located within the same system. Among practices that are in a health care system or group, when sharing data with entities *outside* of their health care system, CPC practices were more likely than comparison practices to report sharing data with local hospitals, other practices, and diagnostic service facilities (Figure 5.6). System-affiliated CPC practices were also more likely than system-affiliated comparison practices to report sharing data *within* their health care system with local hospitals, other practices, and diagnostic facilities.

Figure 5.6. Data sharing by practices that are in a health care system or group

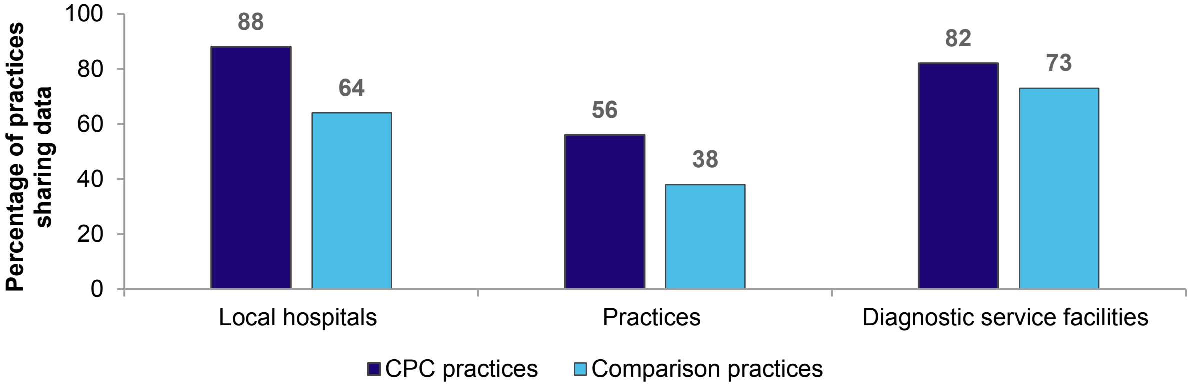


Source: CPC practice surveys administered April through August 2016.

Note: We identified each practice as being part of a system or not, using the practice's responses to the 2016 CPC practice survey. When asked to describe the medical organization that employs the clinicians at the practice site, or who owns the practice, we considered practices that responded with these responses to be in a healthcare system: group or staff model Health Maintenance Organization (HMO); network of clinician practices owned by a hospital, hospital system, or medical school; or hospital or medical school.

Among practices that are not part of a system, a higher proportion of CPC practices than comparison practices shared data with other providers including local hospitals, diagnostic service facilities, and other practices. These findings across both system-affiliated and independent CPC and comparison practices have remained relatively consistent in practice surveys conducted in 2014, 2015, and 2016.

Figure 5.7. Data sharing by practices that are not part of a system



Source: CPC practice surveys administered April through August 2016.

Deep-dive practices continued to report mixed experiences with health information exchanges (HIEs).[60] In 2016, respondents in a couple of practices expressed disappointment with HIEs. One practice manager was frustrated with lack of progress on the statewide HIE in their state and the practice's lack of power to influence HIE development despite being a test clinic for the exchange. Clinicians in a couple of practices also found their state's HIE was providing less access to patient information than they were able to obtain via direct connections between the practices' EHRs and those of other practices and hospitals. On the other hand, respondents in a few practices in another region were pleased their HIE had recently started providing reliable access to hospital and ED records for their patients, though these practices continued to lack sufficient access to specialists' consultation notes and notes from skilled nursing facilities through the HIE.

> "I'm just frustrated trying to figure out what to do with …the state technology that's supposed to make everything talk to each other…. And we've been signed up for it forever, for three years or so, and nothing seems to happen, and I think our hospital is dropping out of it."
>
> *–Practice manager*

These findings are consistent with deep-dive findings from previous years, in which staff in several practices reported that their electronic exchange of patient information was limited to affiliated hospitals or specialists (in system-owned practices), was missing key information from certain specialists or hospitals (in independent practices), or relied on haphazard information sharing by other providers. This limited and incomplete information exchange made it difficult to track and manage the care of high-risk patients by requiring follow-up time to obtain the information, and raising the possibility that important problems were being missed. In several deep-dive practices that had the capability for exchanging information with both affiliated and independent providers, electronic exchange with hospitals and EDs was more common than with specialists. The few deep-dive practices in which staff reported that they could easily exchange information with a variety of specialists were in local areas that reportedly had robust local HIE organizations. Several other practices continued to rely on manual workarounds to track hospitalizations, ED visits, and specialist referrals.

5.5. Monitoring of adequate Milestone achievement

In PY2016, CMS and RLF continued to assess CPC practices' progress based on quarterly Milestone submissions through the CPC web application. CMS assigned a corrective action plan (CAP) to practices that did not meet Milestone requirements. As in PY2015, CMS continued to partially automate the process of assessing each practice's Milestone performance to identify practices in need of either enhanced learning support or corrective action. Specifically, CMS analyzed Milestone data and generated a "flag report" with color coding to identify practices with Milestone deficiencies. Practices that received red flags were referred to CMS region leads for further review. The region leads used a Milestone review guide (developed by CMS) to further assess practices and determine whether they should receive a CAP. If a CMS region lead recommended that a practice receive a CAP, a clinical reviewer from CMS who was involved

---

[60] Fifty-nine percent of CPC practices reported in the 2016 practice survey that they had some form of access to state or regional HIEs.

with the CPC initiative conducted a second-level review using the guide and his/her clinical practice knowledge. This review ensured the review process was fair.

5.5.1. Practices that received CAPs for PY2016 Q1–Q3 performance

Less than 10 percent of practices received CAPs in 2016, and nearly all of the practices that received CAPs were identified for deficiencies in only one Milestone. Forty of the 446 practices participating in CPC in 2016 received CAPs based on their PY2016 performance, and 3 practices from Arkansas, Colorado, and Oklahoma were placed on a CAP twice during 2016 (Table 5.23). Twenty-one of these 40 practices had received a CAP for their Milestone performance in PY2014 or PY2015.

As in PY2015, in PY2016, CMS gave practices two quarters to correct their deficiency. The one practice that received a CAP in the third quarter of PY2016 was urged to work with its RLF to remediate the CAP by the end of the initiative. CMS did not issue CAPs in the last quarter of 2016 because the initiative ended in December 2016.

Table 5.23. Number of practices placed on a CAP for PY2016 performance

	Total number of practices placed on a CAP for PY2016, based on prior quarter's Milestone performance							
PY 2016 quarter in which CAP was issued[a]	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Quarter 1 (Jan–March)	30	9	3	1	2	9	4	2
Quarter 2 (April–June)	12	1	3	1	1	2	4	0
Quarter 3 (July-Sept)	1	1	0	0	0	0	0	0
Total for PY2016	43	11	6	2	3	11	8	2

Source: CAP data provided by TMF Health Quality Institute.

[a] Practices that received a CAP for PY2016 Q1 or Q2 work were expected to remediate by PY2016 Q3 and PY2016 Q4, respectively. Practices that received a CAP in PY2016 Q3 were urged to reach out to their RLF for assistance given that they were near end of the initiative. No CAPs were issued in PY2016 Q4 due to the initiative ending on December 31, 2016.

CAP = corrective action plan.

Of the 43 total CAPs sent to practices in PY2016, one practice received a CAP for deficiencies in two Milestone areas, and two practices received extensions on an existing CAP. Milestones 2, 5, and 6 were the most challenging areas for practices that received CAPs (Table 5.24). Only one practice was notified of a deficiency for Milestone 3: Access and Continuity. No practices were notified of deficiencies for Milestones 1, 4, 7, 8, or 9.

Table 5.24. Percentages of the 40 practices receiving CAPs by Milestone

Milestone 2: Care management for high-risk patients	40%
Milestone 5: Quality Improvement	28%
Milestone 6: Care coordination across the medical neighborhood	30%

CAP = corrective action plan.

5.5.2. Patient dismissal

In previous annual reports, we noted that some deep-dive practices had raised the possibility that an unintended consequence of CPC's focus on improving patient outcomes might lead *other* practices to dismiss patients with poor outcomes. Based on questions we added to the practice survey, we found that CPC practices and comparison practices dismissed patients rarely, at similar rates, and generally for similar reasons. Thus, participation in CPC did not make practices more likely to dismiss patients. According to most CPC practices, the initiative had no effect or made them *less* likely to dismiss patients (O'Malley et al. 2017).

5.6. Facilitators of and barriers to implementing changes in care delivery across Milestones and implications for other care delivery initiatives

In this section, we note facilitators and barriers that influenced implementation across *multiple* Milestones and may have influenced CPC implementation success more broadly. Barriers and facilitators related to *individual* Milestones are discussed earlier in this chapter under the specific Milestones. We then discuss implications of each major finding on cross-cutting barriers and facilitators for other initiatives that transform care delivery. We organize this discussion into the four CFIR domains: (1) characteristics of the CPC initiative, (2) CPC practices' structure and characteristics, (3) practices' strategies to implement CPC, and (4) factors external to CPC practices. In Table 5.25, we summarize these findings and those from the Milestone sections, to identify the individual Milestones related to each barrier or facilitator.

5.6.1. Characteristics of the CPC initiative

Across deep-dive practices, respondents reported that participation throughout the CPC initiative was burdensome, due to the volume and complexity of integrating the numerous required changes into practice workflows. In addition to feeling burdened by individual Milestone activities, several respondents reported that they had overall change fatigue. Some respondents perceived that CPC required too many changes at one time and suggested that their experience with CPC implementation would have been better if they had focused on one Milestone at a time.

> "CPC tried to fix everything in one program, rather than pick one high-value target area, start it, assess it, and then build from there."
> *–Lead clinician*

Given that CPC practices struggled with implementing multiple Milestones simultaneously, other care delivery transformation initiatives could provide a roadmap with suggestions for initial steps, sequencing, and timing, such as the implementation guide CMS subsequently developed for CPC+. Combined with technical assistance and peer-to-peer learning, a roadmap could help practices see the steps needed to implement changes to their workflows.

Deep-dive clinicians and staff perceived that CPC improved the quality, delivery, and organization of patient care, and this perception facilitated implementation. These perceptions were a direct result of practices seeing the impact of their work on the Milestones, particularly Milestones 2, 6, and, to some extent, Milestone 7. For example, in 2016, respondents described how risk-stratification helped practices better allocate staffing resources to meet the needs of different patient populations. Practices noted that CPC helped them track attributed patients, identify gaps in care, and better meet patients' needs. Similar to previous years, respondents noted the value of care management and behavioral health integration for improving the support for high-risk patients and reducing the burden on clinicians in addressing their social needs. Respondents also perceived many positive effects of care transition activities, most notably increased access to patients' hospital discharge records, reduced hospitalizations, and increased quality of care. Care coordination activities helped practices address patient misunderstandings and medication discrepancies upon hospital discharge and prevented future problems. Respondents in several practices perceived that SDM positively affected the quality of patient care because of the emphasis on understanding patients' preferences and basing treatment decisions on patients' goals and lifestyles.

These deep-dive practice perceptions of benefits to patient care resulting from CPC Milestones are supported by clinician and staff survey results. Nearly four years after CPC startup, the initiative was highly rated and recommended by a large proportion of participating clinicians, care managers, and other staff. CPC practice members had largely positive views about their experiences in CPC. The survey asked about the importance of 13 changes promoted by CPC in improving the care the respondent provides to patients. At least 80 percent of respondents rated each category as somewhat important or very important to improving care. For example, 81 percent of CPC physicians thought the initiative's focus on continuity of care and planning for chronic and preventive care needs were very important to improving patient care. This widespread acceptance of the value of the CPC initiative and the perceived quality of its design and ongoing implementation, likely facilitated practice implementation of the large number of challenging CPC requirements. Future primary care transformation initiatives should continue to focus on encouraging changes that align closely with the values and beliefs of primary care clinicians and staff.

5.6.2. CPC practices' structure and characteristics

Differences in resources and autonomy between small independent practices and large or system-owned practices were a common theme throughout CPC and will likely be a factor in other initiatives. Large practices and those that are part of systems are more likely to benefit from economies of scale, have greater data analytics capabilities and QI resources, and have more leverage in negotiating with health IT vendors to secure the functionality needed to support practice transformation goals. At the same time, practices that were part of large health systems typically lacked autonomy at their practice site for hiring staff and changing care delivery. This meant that these practices could rely on standardized approaches to make complex changes such as centralized training and management of care managers, but often had little opportunity to customize these approaches to their local settings. In contrast, small independent practices often had greater autonomy to make changes tailored to their local environment, such as focusing SDM approaches on problems common in their patient population, and were better able to make improvements quickly based on patient feedback, but often struggled with more complex and technical requirements (such as using health IT to document care plans). In the future, initiatives might increase the supports for small independent practices to implement change. Large health systems might work more closely with their practices to seek input from providers on how to roll out changes.

Respondents in deep-dive practices reported that EHR technology continued to present challenges for supporting CPC-related work. Many EHRs used by these practices continued to have limited support for care planning and documenting SDM discussions and patients' care preferences. However, EHRs facilitated some CPC work. QI data, often generated through a practice's EHR, allowed some practices to regularly monitor QI progress and identify new areas for QI work. In addition, practices with electronic access to hospital and ED records were able to identify patients and follow up with them in a timely manner.

5.6.3. Practices' strategies to implement CPC

To engage staff in CPC implementation, some practices held routine meetings, appointed key staff (including physicians in some cases) as champions or change agents, organized care teams, and presented and reviewed data with staff. Having practice leaders review Milestones with clinicians and staff reinforced the clinical importance of each Milestone. In future practice transformation efforts, it will likely be important for practices to have meetings to discuss practice change and QI, have effective and empowered change champions, use teamwork to transform care, and ensure that practice staff understand how their respective roles and responsibilities are changing.

Establishing appropriate care manager workloads and clearly defining care manager roles and responsibilities were challenges in CPC. Care managers often seemed to bear most of the burden associated with CPC's most demanding Milestones (Milestone 2: risk-stratified care management and Milestone 6: care coordination across the medical neighborhood). As a result, care managers reported that they felt overwhelmed with multiple responsibilities outside of care management, large caseloads of high-risk patients, and the need to focus on patients with rapidly rising risk. Using team-based care approaches enabled other team members to take on specific tasks to reduce care managers' burdens.

In future practice transformation efforts, practices will likely need outside support to refine care management roles and to manage the expectations of other practice members for care manager activities. This will be particularly important for practices that have not previously worked with care managers. In addition, integrating care managers into the care team will require continued efforts to gain clinicians' buy-in to the care manager role and an emphasis on the importance of clinicians introducing patients to care managers in person. These activities will help effectively integrate this new service into primary care practices while avoiding overwhelming care managers with other tasks. In some practices, this will require investing more resources in care manager training, support, and staffing.

5.6.4. Factors external to CPC practices

Across deep-dive practices, respondents noted they had difficulties in engaging some patients in CPC efforts. Deep-dive respondents reported that some patients lacked interest in modifying behavior, adhering to treatment recommendations, or setting health goals, resulting in barriers to successful care management. Other patients reportedly were not responsive to educational efforts on appropriate use of the ED, and continued to use the ED for issues more appropriate for practice-based care. In addition, some patients reportedly denied health issues or wanted clinicians to make decisions for them, which impeded efforts to engage them in SDM. Respondents noted challenges enlisting a representative sample of patients to fill out patient surveys. Finally, respondents faced challenges engaging patients in PFACs, particularly because (1) scheduling meetings when a diverse mix of patients could attend was difficult, and (2) patients sometimes doubted their participation would influence practice operations.

Despite patient engagement challenges, deep-dive practice respondents reported they increased patient engagement through education, sharing information, and building trust over time. Practices engaged patients by delivering patient education during care transition phone calls, mailing written materials about inappropriate ED use, and inviting some patients to participate in PFACs. Clinicians helped engage patients in their care by using “warm hand-offs” (with the clinician introducing the patient to the care manager) to help establish a relationship between the care manager and the patient. As care managers and patients interacted and discussed the patients’ needs, many established trusting relationships.

Providers in future care transformation initiatives will likely struggle to engage some patients in modifying unhealthy behaviors, adhering to agreed-upon treatment recommendations, engaging with care managers, using the ED only for emergency situations, and appropriately using patient portals. Addressing these challenges will require support to help practices motivate patient behavior change, promote enhanced access to after-hours care, provide patient education campaigns, change workflows in the practice, and refine practices’ phone triage and portals. Practices will also need to work with EDs on steering non-urgent patients to primary care or to after-hours settings.

Another patient engagement challenge is recruiting diverse groups of patients to participate in PFACs, including people who: are working, are retired, have different health concerns, have time-consuming parenting or caregiving roles, and have a range of incomes and educational levels. This will require some creative approaches and flexible scheduling. For example, providers could consider using videoconferencing, Skype, or telephone to enable people who have difficulty traveling to attend PFAC meetings.

Many independent CPC practices had limited access to health information from other providers and exchanging information with specialists, hospitals, and community-based services remains challenging. Practices that are affiliated with systems typically have access to information from other providers within their system but more limited access to information outside of the system. Many of the HIE challenges CPC practices faced are likely to affect other practice transformation initiatives, given the lack of an infrastructure for true health IT interoperability or effective information exchange across different health IT systems.

Practices faced barriers to using their EHRs to facilitate practice change due to inadequate functionalities for particular Milestones. Respondents noted that the lack of a robust functionality for creating care plans and sharing them within and across practices hindered work on Milestone 2. In addition, inadequate EHR functionalities to support care delivery will likely continue, and practices that lack sufficient market presence to obtain cooperation from EHR vendors to design or refine such functionalities will likely continue to face challenges. Greater involvement of health IT vendors in supporting future care transformation efforts, such as the approach CMS is testing in the CPC+ model, could help to address these issues.

Practices noted that the current FFS payment incentives posed challenges to delivering comprehensive primary care in CPC and to improving patient outcomes. Although practices received upfront care management payments for CPC patients (and, in a few regions, shared savings), they faced challenges associated with a payment system that largely rewards the number of visits rather than (1) the efforts of counseling patients, coordinating their care, and providing comprehensive primary care—including a reduction in and more appropriate use of specialists, or (2) the outcomes of these efforts. For example, because most clinicians are paid more if they do more patient visits, practices noted less inclination to devote time to particular Milestone activities, such as SDM, discussing specific patients with a care manager, or delivering more comprehensive care. Teamwork approaches can help to mitigate this challenge by offloading some nonbillable tasks from practitioners to other staff such as nurses and medical assistants.

Even with greater rewards and increased supports for primary care practices in changing how they deliver care, the volume-based FFS incentives underlying the behavior of specialists and hospitals will continue to present a challenge to making primary care more comprehensive and patient-centered. To deliver more comprehensive primary care, practices would ideally limit referrals to specialists to unique or particularly complex issues. However, under the current FFS system, primary care practices have incentives to increase visit volume (and therefore decrease visit complexity) by referring patients to specialists, and hospital systems reap financial rewards when patients are cared for by more highly reimbursed specialists rather than managed in the primary care practice. In addition, Medicare FFS beneficiaries can self-refer to specialists, so they exercise substantial control over their utilization of services. Thus, high-cost diagnostic testing and procedures will likely continue to occur outside of the realm of the primary care practice's control. Restructuring incentives to other providers and to patients themselves may help to address these issues.

Collaborating with community-based partners requires primary care practices to expand their traditional medical model of health care to better integrate community resources into patient care. CPC funding supported practices in enhancing this capacity. Practices in other initiatives without experience linking patients to community services will likely find this work challenging and may need support in this area.

In sum, CPC practices made substantial changes in how they deliver care to their patients over the course of the initiative. CPC participants perceived that the biggest benefit of CPC participation was increased capacity to provide care management services to high-risk patients. Comparison practices also showed improvements, though to a lesser degree than CPC practices. In particular, Medicare FFS beneficiaries in CPC practices were more likely than beneficiaries in comparison practices to report timely follow-up after hospital and ED discharge. There is room for more improvement on each of the CPC functions. Findings on how practices changed in CPC, as well as about facilitators and barriers to change, can inform future primary care delivery models.

Practice change is difficult to achieve, even when CPC practices are receiving financial and other supports, and it takes time for those changes to influence patient outcomes and health care expenditures. The challenges to practice change were numerous, including limited bandwidth to fully engage in addressing multiple Milestones simultaneously, inadequate support for robust care management and health IT implementation in smaller independent practices, inadequate infrastructure for health information exchange, inadequate ability of current EHRs to support some of the Milestone activities, and many layers of management in larger system-owned practices. In addition, all practices faced challenges related to practice, provider, and patient cultures; long-entrenched behaviors; leadership; teamwork functioning; and external financial or policy factors beyond their control. Even with change in primary care practice delivery, the other providers (specialists and hospitals) treating the same patients often did not share the same incentives to coordinate care and faced volume-based productivity incentives. Overcoming these challenges to modify workflows and system supports consistently across providers requires ongoing time, resources, and effort not just from CPC practices and their large health systems, but also from specialists and hospitals outside of the CPC initiative. Moving forward, it will be important to also address these external factors, such as poor health information exchange and current fee-for-service incentives, which affect multiple actors in the health care system. Attention to these challenges can help maximize the potential benefits of changes made by primary care practices.

Table 5.25. Facilitators of, and barriers to, implementation of CPC Milestones for PY2016, as reported by deep-dive practices

	CPC Milestone for PY2016							
	Milestone 2	Milestone 3	Milestone 4	Milestone 5	Milestone 6	Milestone 7	Milestone 8	Milestone 9
	Care management	Access and continuity	Patient experience	Quality improvement	Care coordination	Shared decision making	Participating in learning collaborative	Health IT
Characteristics of the CPC initiative								
Facilitators								
Risk- stratified care management seen by practices as improving other Milestones	F	F	F	F	F	F		
Improved care via advanced primary care strategies	F							
Patient input via PFACs			F	F				
Barriers								
Changes in staff roles and time required to implement change	B					B	B	
Limited usefulness of feedback reports				B				
Numerous required changes across complex care delivery areas	B		B	B				
Practice structure and characteristics								
Facilitators								
Communication and teamwork	F			F	F	F		
System-affiliated practices tended to have support for health IT, QI, and enhanced access		F		F				F
Investment of practice resources in Milestone-related activities	F	F	F	F	F	F	F	F
Barriers								
Care management staff burdened by multiple tasks	B				B	B		
Inadequate EHR functionality to support Milestone activities	B			B	B	B		B
Resistance from staff to integrating care manager role into practice	B							
Practice strategies and implementation processes								
Facilitators								
Effective role delegation from clinicians	F				F			

Table 5.25 *(continued)*

	CPC Milestone for PY2016							
	Milestone 2	Milestone 3	Milestone 4	Milestone 5	Milestone 6	Milestone 7	Milestone 8	Milestone 9
	Care management	Access and continuity	Patient experience	Quality improvement	Care coordination	Shared decision making	Participating in learning collaborative	Health IT
Educating patients and building trust over time			F	F		F		
Access to implementation supports tailored to the practice’s needs							F	
Barriers								
Inadequate technical assistance with EHR data issues	B			B	B	B		B
Difficulty identifying patients to target for SDM						B		
Lack of developed workflows	B				B	B		
External environment and context								
Facilitators								
Developing or having established relationships with hospitals and specialists	F				F			F
Community resources are available	F							
Barriers								
Limited supply of care managers in rural areas	B							
Duplication of care management services from outside providers	B				B			
Lack of electronic access to health information from other settings					B			B
External payment environment					B			
Limited access to behavioral health providers	B							
Difficulty engaging specialists in care compacts					B			
Clinicians lacked training in SDM						B		
Difficulty engaging patients in Milestone activities	B	B	B			B		

Note: Facilitators are marked with a green (**F**) and barriers with a red (**B**) for each Milestone to which they apply. Some issues (for example, patient receptivity to change or willingness to engage in activities) can be both facilitators and barriers and may therefore appear in both rows.

This table excludes Milestone 1 which focuses on CPC budgets because we did not ask about it in deep-dive interviews. See Chapter 3 for information on CPC budgeting. The table marks only barriers or facilitators that the deep-dive practices raised; some of these barriers and facilitators might influence other Milestones among the full set of CPC practices.

EHR = electronic health record; QI = quality improvement; PFAC = patient and family advisory council; SDM = shared decision making.

6. HOW DID CPC AFFECT THE EXPERIENCES OF PHYSICIANS, OTHER CLINICIANS, AND STAFF?

The CPC initiative aimed to transform care delivery and ultimately improve the experience of physicians, other clinicians, and staff in CPC practices by providing them with more resources to support the delivery of primary care to their patients. At the same time, practice transformation efforts like CPC require intensive work, including substantial change to practice workflows and staffing, shifting from a physician-centric to a team-based culture, and creating new clinical and administrative tasks. Therefore, there was concern that CPC might add to physicians' burden, worsen their experience, and increase job dissatisfaction, at least in the short run. For example, a qualitative study of practices transitioning to patient-centered medical homes (PCMHs) in the National Demonstration Project (NDP) found that "…the magnitude of stress and burden from the unrelenting, continual change required to implement components of the NDP was immense" (Nutting et al. 2010). Another study found burnout rates among physicians and staff in practices participating in accountable care organizations (ACOs) and those with meaningful use certification were 1.2 to 1.3 times higher than physicians and staff outside of these practices (Edwards et al. 2017).

This chapter examines whether primary care physicians in CPC practices experienced their work differently from primary care physicians in comparison practices, how other members of CPC practices experienced their work, and whether experience changed over time. Appendix E details the survey sampling, fielding, content, and methods and contains tables with the results.

6.1. Key takeaways on the effect of CPC on physician, other clinician, and staff experience

We obtained survey responses from a sample of roughly 600 physicians in CPC practices and 500 physicians in comparison practices about 11 months after CPC began and again 44 months into the 51-month initiative. To provide additional perspectives on CPC, we also collected surveys from about 150 other clinicians (nurse practitioners and physician assistants [NPs/PAs]) and about 2,000 staff (care managers or care coordinators, medical assistants, nurses, practice managers or supervisors, and receptionists or appointment clerks).

- Overall, there were no meaningful differences on measures of burnout, control over work, alignment of work with training, or work satisfaction between physicians in CPC and comparison practices in 2016, the last year of CPC, or over time among CPC physicians, NPs/PAs, and staff.
- There was no differential effect of CPC on most measures of physician experience on physicians whose practices were in a system, were larger (measured by having more primary care clinicians), or served attributed Medicare beneficiaries with a higher risk score (measured by the average Hierarchical Condition Category [HCC] score for their practice). The one exception was that there was a smaller difference in the effect of being in a system on the percentage of physicians reporting that 75 percent or more of their time is spent doing work that is well matched to their training among physicians in CPC practices compared to physicians in comparison practices.

- Together, these findings suggest that CPC did not meaningfully alter clinician and staff experience, either favorably or unfavorably, for the overall sample or for key subgroups.
- Although CPC did not have differential effects on physicians in practices that were part of a system, had different numbers of primary care clinicians, or had higher-risk beneficiaries, we did find differences among subgroups of physicians when we combined CPC and comparison physicians for analysis. Specifically, physicians whose practices were part of a system reported that they had less control over their work, and they spent less time doing work that was well matched to their training and more time doing work that someone with less training could do; in addition, they were less likely to report being satisfied with their current job than physicians whose practices were not part of a system. Physicians in larger practices reported that they had less control over their work than physicians in solo clinician practices, and physicians in practices with lower-risk beneficiaries were less likely to report being satisfied with their current job than physicians in practices with higher-risk beneficiaries.
- CPC physicians, NPs/PAs, and staff had largely positive views about their experiences participating in CPC. For example, in 2016, 80 percent of physicians reported that CPC had improved the quality of care or service provided to their patients, and if they could do it all over again, 79 percent would support participation in CPC. Only 12 percent of physicians would oppose participation in CPC and 9 percent reported not knowing enough about CPC to answer.
- Regardless of whether they would support participation in CPC again, respondents were asked about reasons to support and oppose participation. Among physicians that would support their practice's participation in CPC, the most common reasons for supporting CPC were: they believed work on CPC Milestones helped practices make positive changes and improve patient care (81 percent), they valued the opportunity to contribute to primary care practice transformation (52 percent), and the financial support provided by CPC was sufficient to support their participation (52 percent). Still, even supporters reported that CPC administrative reporting was a burden and that the transformation work in CPC was difficult. Forty-four and 34 percent of physicians that would support their practice's participation in CPC again, reported this, respectively. Additionally, about one-third of these physicians reported inadequate financial support as a reason to oppose CPC participation, and one-quarter reported inadequate staffing.
- Although the evidence suggests that CPC did not adversely affect physician and staff experience, future initiatives could nevertheless work with practices to reduce burnout, improve delegation, and streamline administrative requirements.

6.2. Methods

6.2.1. Survey content and measures

The clinician and staff survey gauges respondent perceptions of and experiences with various components of care delivery. The survey questions are both specific to the CPC initiative, such as the usefulness of feedback reports from Medicare and other payers, the usefulness of CPC supports, and the importance of CPC functions and Milestones in improving care, and ask about more general components of care delivery, such as practices' care management activities, work environment, burnout and satisfaction, and use of electronic health records in managing patient care. The findings we present in this chapter focus on five domains: (1) burnout, (2) control over work, (3) alignment of work with training, (4) satisfaction with work, and for respondents from CPC practices, (5) ratings of CPC. Table 6.1 lists the survey questions that we use to evaluate clinician and staff experiences across these domains. In addition to the results we present here, we discuss additional findings from the clinician and staff survey in Chapters 3 and 5.

Burnout. Burnout—when workplace stress leads to emotional exhaustion, depersonalization, and a diminished sense of personal accomplishment, among other negative effects—is an important outcome to examine as part of the evaluation of CPC, as it has been linked to lower work satisfaction, disrupted personal relationships, substance abuse, depression, and suicide among physicians (Maslach et al. 1996, 2001; van Der Heijden et al. 2008; Wurm et al. 2016; Panagioti et al. 2017). Burnout is prevalent among primary care physicians; the literature over the past decade indicates that between 20 and 45 percent of primary care physicians report being burned out (Edwards et al. 2017; Dolan et al. 2015; Helfrich et al. 2014; Lewis et al. 2012; Reid et al. 2009, 2010). The literature also suggests that burnout is less of a problem among staff. For example, Edwards et al. (2017) found that 26 percent of physicians reported high levels of burnout, compared with 21 percent of NPs/PAs and 20 percent of other clinical staff. Dolan et al. (2015) found that 45 percent of physicians, NPs, and PAs felt burned out weekly compared with 40 percent of registered nurses (RNs) and 31 percent of clinical associates. Burnout appears to be on the rise: the percentage of U.S. physicians of any specialty that reported burnout grew from 46 to 54 percent from 2011 to 2014 (Shanafelt et al. 2015). There is concern that practice transformation efforts like CPC may worsen provider experience, at least in the shorter term (Nutting et al. 2010; Edwards et al. 2017).

Physician burnout is typically measured through the use of the Maslach Burnout Inventory (MBI), a validated and reliable instrument designed to assess burnout by examining 22 questions, grouped into three subscales focused on emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach et al. 1996). Subsequent research has demonstrated a high association between MBI scores and a single-item question taken from the Physician Worklife Study (PWS)—asking physicians to use their own definition of burnout and rate burnout using five options ranging from no burnout to complete burnout—giving researchers an alternative and potentially easier method to study the phenomenon (Rohland et al. 2004). Another validated single-item measure of burnout (West et al. 2009, 2012) from the MBI asks respondents how often they felt burned out from their work in the past year (with response options of never, a few times a year or less, once a month of less, a few times a month, once a week, a few times a week, and every day).

To measure burnout, the CPC survey used the two single-item measures and 9 of the 22 items in the MBI that another study has used to measure emotional exhaustion, depersonalization, and personal accomplishment (McManus et al. 2002; see Table 6.1).

Control over work. Several studies have linked higher levels of control over work and autonomy to higher levels of work satisfaction and lower levels of stress among physicians (Landon et al. 2003; Linzer et al. 2002, 2009). We examined control over work to identify whether, taken as a whole, the administrative reporting requirements, new work processes, and in many cases, new staff associated with participation in CPC altered control over work.

The survey asked respondents to indicate how much control they have over seven areas of work: (1) the hours they work, (2) details of the office or practice schedule, (3) the volume of paperwork they have to do, (4) work interruptions, (5) workplace issues, (6) the pace of their work, and (7) the allotment of additional time for difficult-to-help patients. Response options were slight/no control, some control, moderate control, great control, and does not apply or don't know.

Alignment of work with training. Alignment of work with training is an important component of physician satisfaction. We expected it to be affected by the new staffing arrangements and approaches to teamwork used by many practices to complete the CPC Milestones. Prior research indicates that physicians whose work content matches their training are more satisfied than physicians who are doing work that they believe other staff could perform (Friedberg et al. 2014).

To assess alignment of work with training, the CPC survey asked respondents what proportion of time each week they typically spend doing (1) work that could be done by someone with less training, (2) work for which they do not have enough training, and (3) work that is well-matched to their training. Response options were less than 25 percent of the time, between 25 and 49 percent, between 50 and 74 percent, 75 percent or more, or does not apply or don't know. Due to the high proportion of does not apply or don't know responses, these are the only measures for which we exclude these responses from results presented here.

Satisfaction with work. Primary care transformation can be rewarding and challenging. To assess differences in satisfaction between CPC and comparison physicians, and among CPC clinicians and staff, the survey included two questions to assess general job satisfaction among respondents: (1) how much the respondent agrees or disagrees that he or she is satisfied with his or her current job (response options were strongly disagree, disagree, neither disagree or agree, agree, and strongly agree), and (2) the likelihood that he or she will leave his or her current practice within two years (response options were none, slight, moderate, likely, and definitely) and his or her primary reason for leaving.

Ratings of CPC. In the 2016 survey, we asked clinicians and staff in CPC practices to reflect on their experience participating in the CPC initiative. We asked them how their participation in the initiative changed the quality of care or service that they provide to their patients (with response options of improved a lot, improved somewhat, did not change, worsened a lot, and don't know); and knowing what they know now, would they support their practice's participation in CPC again (with response options of strongly support, somewhat support, somewhat oppose, strongly oppose, and don't know enough about CPC to answer). Regardless of whether they would support participation in CPC again, we then asked their main reasons to support participation and their main reasons to oppose participation. We asked respondents to select all response options that apply. We provided the following response options for main reasons to *support* participation in CPC:

- Work on CPC Milestones helps practice make positive changes and improve patient care
- Work on CPC Milestones improves clinician and staff work satisfaction
- Financial support provided in CPC is sufficient to support participation

- Learning support and activities provided in CPC are useful
- Learning support provided in CPC improves clinician and staff skill development
- Data/feedback reports provided in CPC are useful
- Opportunity to contribute to field of primary care practice transformation
- Other
- No reasons to support participation in CPC

The survey provided the following response options for the main reasons to *oppose* participation in CPC*:*

- CPC does not allow the practice to join an accountable care organization (ACO)
- Reporting requirements in CPC are too burdensome
- Work involved in implementing the CPC Milestones is too burdensome
- Financial support provided in CPC is insufficient to support participation
- Insufficient practice staffing to participate in CPC
- CPC does not substantially improve patient care
- Other
- No reasons to oppose participation

Table 6.1. Questions and domains included in this chapter

Topics	Questions included (Round 2 survey instrument numbering)
Burnout[a]	
	E6: Using your own definition of burnout, please indicate which statement best describes your situation at work
	E5j: How often respondent feels burned out from work
Maslach Burnout Inventory (MBI) subscales[b]	
Emotional exhaustion	
	E5c*: How often respondent feels emotionally drained from work
	E5d*: How often respondent feels fatigued from facing another day on the job
	E5g*: How often respondent feels working with people all day is a strain
Depersonalization	
	E5b*: How often respondent feels he/she treats some patients as if they were impersonal objects
	E5e*: How often respondent has become more callous toward people since taking the job
	E5h*: How often respondent doesn’t care what happens to some patients
Personal accomplishment	
	E5a: How often respondent deals effectively with patients’ problems
	E5f: How often respondent feels he/she is positively influencing others’ lives through work
	E5i: How often respondent feels exhilarated after working closely with patients

Table 6.1 *(continued)*

Topics	Questions included (Round 2 survey instrument numbering)
Control over work[c]	
	E3a: The amount of control the respondent has over the hours he/she works
	E3b: The amount of control the respondent has over details of the office or his/her practice schedule
	E3c: The amount of control the respondent has over the volume of paperwork he/she has to do
	E3d: The amount of control the respondent has over work interruptions
	E3e: The amount of control the respondent has over workplace issues
	E3f: The amount of control the respondent has over the pace of his/her work
	E3g: The amount of control the respondent has over the allotment of additional time for difficult-to-help patients
Alignment of work with training[d]	
	E2a: The proportion of time each week spent doing work that could be done by someone with less training
	E2b: The proportion of time each week spent doing work for which the respondent does not have enough training
	E2c: The proportion of time each week spent doing work that is well-matched to the respondent's training
Satisfaction with work[e]	
	E4: Overall satisfaction with current job
	E7: Likelihood that respondent will leave his/her current practice within two years
Ratings of CPC (Questions asked in 2016 and only to CPC clinicians and staff)	
	H6: How much participation in the CPC initiative changed the quality of care or service that the respondent provides to his or her patients
	H7: Knowing what you know now, how much you would support or oppose your practice's participation in the CPC initiative
	H8: Main reasons respondent would support participation in the CPC initiative
	H9: Main reasons respondent would oppose participation in the CPC initiative

* Responses to these questions were reverse-coded when we constructed the composite measures, so the most favorable response received the largest value.

[a] The first single item was taken from the Federally Qualified Health Center Advanced Primary Practice Provider and Staff Survey developed by the RAND Corporation (RAND 2013). The second item is 1 of the 22 items in the MBI (Maslach et al. 1996), and validated as a single-item measure of burnout by West et al. 2009.

[b] The MBI contains 22 items divided into the three subscales (Maslach et al. 1996). We use an abbreviated version of the subscales containing the 9 items used by McManus et al. (2002) in an evaluation of the Patient Aligned Care Team (PACT) Personnel Survey.

[c] The seven items in the control-over-work composite measure are taken from a modified version of the Agency for Healthcare Research and Quality (AHRQ) Minimizing Errors and Maximizing Outcomes (MEMO) survey (Linzer et al. 2005).

[d] The three items used to measure alignment of work with training were taken from the Veterans Administration PACT National Evaluation Personnel survey (Healthcare Analysis & Information Group 2012).

[e] The two items are taken from the Federally Qualified Health Center Advanced Primary Practice Provider and Staff Survey developed by the RAND Corporation (RAND 2013).

6.2.3. Survey administration

We administered two rounds of the CPC clinician and staff surveys by mail. We sent the first survey about one year into CPC (September 2013 through March 2014, or 11 to 17 months into CPC). We sent the second survey toward the end of the 51-month initiative (June through November 2016, or 44 to 50 months into CPC).

As an incentive to complete the 15- to 25-minute survey, we enclosed a $100 check in the initial mailing for the surveys of clinicians (physicians, nurse practitioners, and physician assistants) in CPC and comparison practices, and a $20 check for the survey of staff in CPC practices. In the second round, we increased the staff incentive to $25.

6.2.4. Survey sample and response rates

We administered the surveys to samples of physicians and NPs/PAs in the CPC practices and in comparison practices that we selected using propensity score matching to have similar market-, practice-, and patient-level characteristics before CPC began. (See Appendix H for a description of comparison group selection.) The physicians and NPs/PAs that we surveyed were drawn as longitudinal samples with replacement. Response rates were high in both rounds of data collection. Eighty-one percent of sampled physicians from CPC practices responded to the first round of the survey in 2013, and 76 percent responded to the second round of the survey in 2016. We received surveys from physicians in 432 CPC practices in 2013 and 412 CPC practices in 2016. The corresponding response rates among sampled physicians in comparison practices were 70 and 72 percent, representing 330 and 349 practices, respectively. Eighty-five percent of sampled CPC NPs/PAs responded to the first round of the survey, and 83 percent responded to the second round; 66 and 73 percent of sampled comparison NPs/PAs responded to the survey, depending on the round. By design, some physicians and NPs/PAs responded to both rounds. Forty-eight percent of CPC physician respondents and 42 percent of comparison physician respondents completed both surveys, and 38 percent of NP/PA respondents in CPC practices and 31 percent of NP/PA respondents in comparison practices responded to both rounds. Table 6.2 reports the population in the practices, the number we surveyed, and the number who responded, by respondent type.

In both rounds, we also surveyed cross-sectional samples of other staff in CPC practices including care managers or care coordinators, medical assistants, nurses, practice managers or supervisors, and receptionists or appointment clerks. Between 73 and 85 percent of these staff types responded to the survey, depending on the round.

Table 6.2. Sample sizes and weighted survey response rates for the primary care clinician and practice staff surveys, by round

	Round 1 (2013)				Round 2 (2016)			
Sample type	Population size	Sample size	Number responded	Response rate (percentage)[a]	Population size	Sample size	Number responded	Response rate (percentage)[a]
Clinicians								
Primary care physicians	4,944	1,581	1,082	75	4,658	1,700	1,124	74
CPC practices	1,831	867	635	81	1,677	912	630	76
Comparison practices	3,113	714	447	70	2,981	788	494	72
NPs/PAs	1,198	410	255	72	1,620	405	262	76
CPC practices	421	226	151	85	527	222	159	83
Comparison practices	777	184	104	66	1,093	183	103	73

Table 6.2 *(continued)*

	Round 1 (2013)				Round 2 (2016)			
Sample type	Population size	Sample size	Number responded	Response rate (percentage)[a]	Population size	Sample size	Number responded	Response rate (percentage)[a]
CPC practice staff								
Care manager/ care coordinator	104	104	63	82	274	274	208	85
Medical assistant	1,889	927	525	74	2,080	848	572	76
Nurse	1,059	548	325	75	1,320	567	419	83
Practice manager/ supervisor	559	397	271	81	552	370	276	78
Receptionist/ appointment clerk	1,638	838	490	73	1,722	767	538	78

Source: The population of primary care physicians and NPs/PAs came from SK&A, a health care data vendor, in June 2013 for Round 1 and March and April 2016 for Round 2. CPC practices provided a list of the names and job titles of staff in October 2012 for Round 1 and February and March 2016 for Round 2 from which we determined the population of each staff type. The numbers of staff are based on the person's job title. For example, only those with explicit care manager or care coordinator job titles were classified as such. A licensed practical nurse functioning as a care manager would not be classified as such if the job title were listed as licensed practical nurse.

[a] Response rates were weighted using the sample design weights. Ineligible cases are excluded.

6.2.5. Analysis

Estimation. For each survey question, we estimated what the average survey responses would have been in the population for each respondent type and survey round. We did so by adjusting for the probability of selection into the sample, comparison group selection, and survey nonresponse. In addition to calculating responses to individual questions, we created summary composite scores for two of the five domains discussed in this chapter: burnout and control over work. Because most respondents completed most questions, we calculated results among nonmissing responses and did not adjust for question nonresponse.[61] For each question and composite score, separately for each round, we statistically compared the responses of CPC physicians with those of comparison physicians to identify where CPC may be affecting physician experience. We clustered standard errors by practice for all CPC respondents and by matched set for comparison respondents to account for clustering of responses within a practice or matched set and for respondents answering in more than one round. Given the similar characteristics of the CPC and comparison physicians after weighting, we did not regression-adjust the results (see Appendix E, Table E.4 for the distribution of physician characteristics for CPC and comparison practice respondents by round). We also report results for NPs/PAs and staff in CPC practices.

---

[61] The rate of question nonresponse among survey respondents varied from 1 to 6 percent, with 75 percent of questions having lower than 5 percent nonresponse.

Analytic comparisons. In this chapter, we focus on differences in responses between primary care physicians in CPC and comparison practices in the second round of the survey, in 2016, as an indication of the influence of CPC. Because we were unable to collect data at the start of the initiative, differences we see in 2016 may reflect pre-existing differences between respondents in the CPC and comparison practices. Related to this absence of baseline data, we did not calculate difference-in-differences estimates; because CPC practices may have already begun to change by the time of the first survey in 2013 (11 to 17 months into the initiative), we do not have a true baseline. We do note changes in responses between the 2013 and 2016 surveys. To limit the chances of false positives from multiple comparisons, we did not test the statistical significance of differences in responses across respondent types or over time.

We do not discuss differences in responses of NPs and PAs in CPC versus comparison practices because a higher proportion of CPC practices than comparison practices had an NP or PA (about 25 percent of CPC practices versus 11 percent of comparison practices in each survey round); this difference raises the possibility that the NPs/PAs play different roles in CPC and comparison practices.

Subgroup effects. We also examined responses for CPC and comparison group physicians for select questions in each of the five sets of outcomes for three key subgroups (see Appendix E for more information):

- Whether the physician is part of a system (from 2016 data from SK&A, a healthcare vendor)
- Size of the physician's practice (measured by the number of primary care clinicians in the practice in 2012). We separated practices into four groups: practices with one clinician, two to three clinicians, four to five clinicians, and six or more clinicians. We statistically tested differences in responses between physicians in practices with one clinician and physicians in practices with six or more clinicians; we show findings for each of the four groups in Appendix E.
- Whether the average Hierarchical Condition Category (HCC) score of Medicare FFS beneficiaries in the physician's practice is above or below the median for all practices in the sample (using patients' 2012 HCC score)[62]

We first examined whether the responses differ between physicians in and not in the subgroup, using the combined CPC and comparison physicians. We then estimated whether CPC had a differential effect on physicians in the subgroups.

To test for subgroup effects, we used logistic regressions for binary outcomes and OLS regressions for other outcomes. We first estimated a regression on each outcome with the CPC and comparison physicians combined, with a binary indicator for whether the physician's practice was in the subgroup of interest. We examined whether the coefficient on the subgroup indicator for the CPC and comparison physicians combined was statistically significant to

---

[62] HCC scores are a measure of risk for subsequent expenditures. CMS calculates them such that the average for the Medicare FFS population nationally is 1.0. A patient with a risk score of 1.30 is predicted to have expenditures that would be approximately 30 percent above the average, whereas a patient with a risk score of 0.70 is expected to have expenditures that would be approximately 30 percent below the average. See Pope et al. (2004) for details on the construction of HCC scores.

determine whether there were different responses by subgroup. We then estimated regressions on each outcome with three explanatory variables: (1) a binary indicator for treatment (CPC group) status, (2) a binary indicator for whether the physician's practice is in the subgroup, and (3) a term interacting treatment and subgroup status. We examined whether the coefficient on the treatment (CPC group)-subgroup interactor was statistically significant to determine whether CPC had a differential effect for members of the subgroup. (We did not test this finding for the two measures for ratings of CPC, which were asked only of physicians in CPC practices.)

Power. Using two-tailed tests at the 10 percent significance level, the analysis has 80 percent power to detect differences between CPC and comparison physician responses of 5 to 11 percentage points for the categorical variables and 0.06 points out of one for the control-over-work composite measure.

Statistical and substantive significance. Because CPC-comparison differences would have to be fairly large for us to be confident that they were statistically significant, we considered responses between physicians in CPC and comparison practices to be of substantial importance if the difference between the two groups was larger than five percentage points. We also tested whether each difference was statistically significant at the 0.10 level.

6.3. Findings

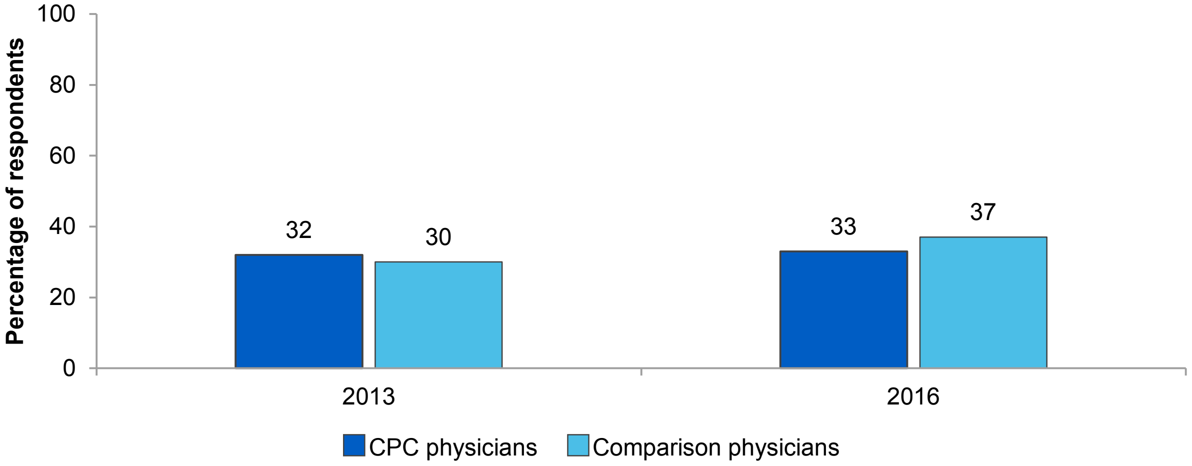
6.3.1. Burnout

CPC survey results suggest that burnout is an issue for physicians and NPs/PAs in both CPC and comparison practices (and to a lesser extent for staff) but that CPC did not affect burnout.

Physicians. Burnout was comparable for CPC and comparison physicians for the various survey items measuring burnout.

- When asked to select one of five statements that best describes *the amount of burnout* they have at work, ranging from "I enjoy my work. I have no symptoms of burnout," to "I feel completely burned out and often wonder if I can go on," a comparable one-third of physicians in CPC practices and comparison practices reported high levels of burnout (Figure 6.1). This finding falls in the middle of the range reported in the literature, which indicates that between 20 and 45 percent of primary care physicians report being burned out (Edwards et al. 2017; Dolan et al. 2015; Helfrich et al. 2014; Lewis et al. 2012; Reid et al. 2009, 2010).

Figure 6.1. Percentage of physicians reporting high levels of burnout, CPC and comparison practices, 2013 and 2016



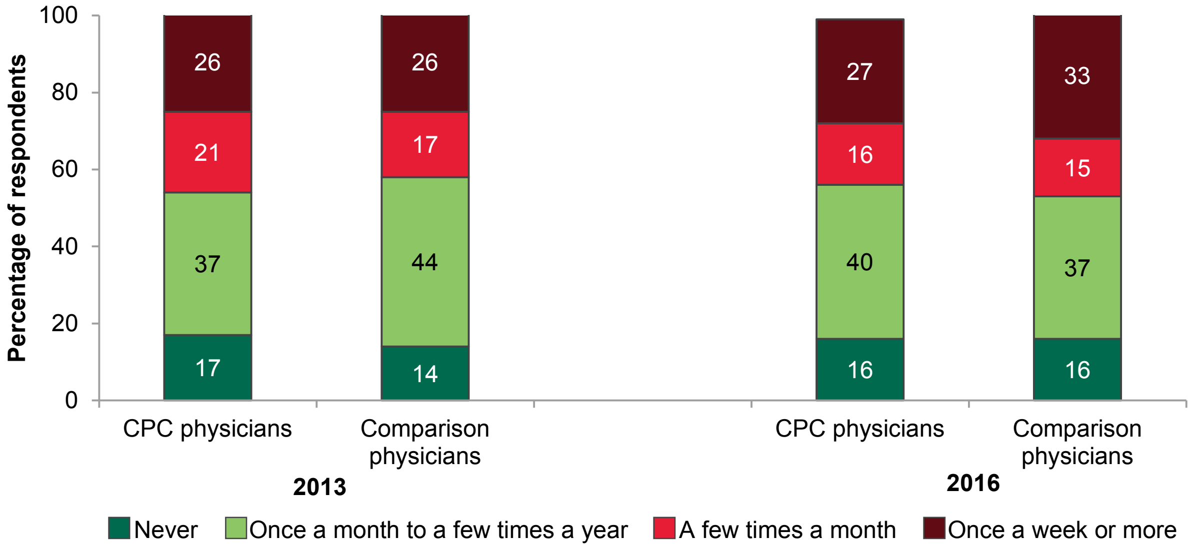
Source: Mathematica analysis of 2013 and 2016 CPC clinician surveys.

Note: Respondents were asked to, using their own definition of burnout, select one of five statements that best describes their burnout at work. Following the literature, we define high levels of burnout as having one of the following three responses: (1) I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion; (2) the symptoms of burnout that I’m experiencing won’t go away, and I think about frustrations at work a lot; and (3) I feel completely burned out, often wonder if I can go on, and am at the point where I may need some changes or may need to seek some sort of help (Rohland et al. 2004).

Response distributions for these questions were not statistically significantly different between CPC and comparison physicians at the $p < 0.10$ level.

- When asked *how often they felt burned out* from their work in the past year, 27 percent of CPC physicians and 33 percent of comparison physicians reported feeling burned out once a week or more in 2016, and another 16 percent of CPC physicians and 15 percent of comparison physicians reported feeling burned out a few times a month (Figure 6.2). Other published studies have found higher reports of weekly burnout among primary care providers; for example, Dolan et al. (2015) found that 45 percent of primary care providers at Veterans Administration clinics (a group that included both physicians and NPs/PAs) reported feeling burned out weekly.

Figure 6.2. Percentage of physicians reporting how often they felt burned out from their work in the past year, CPC and comparison practices, 2013 and 2016



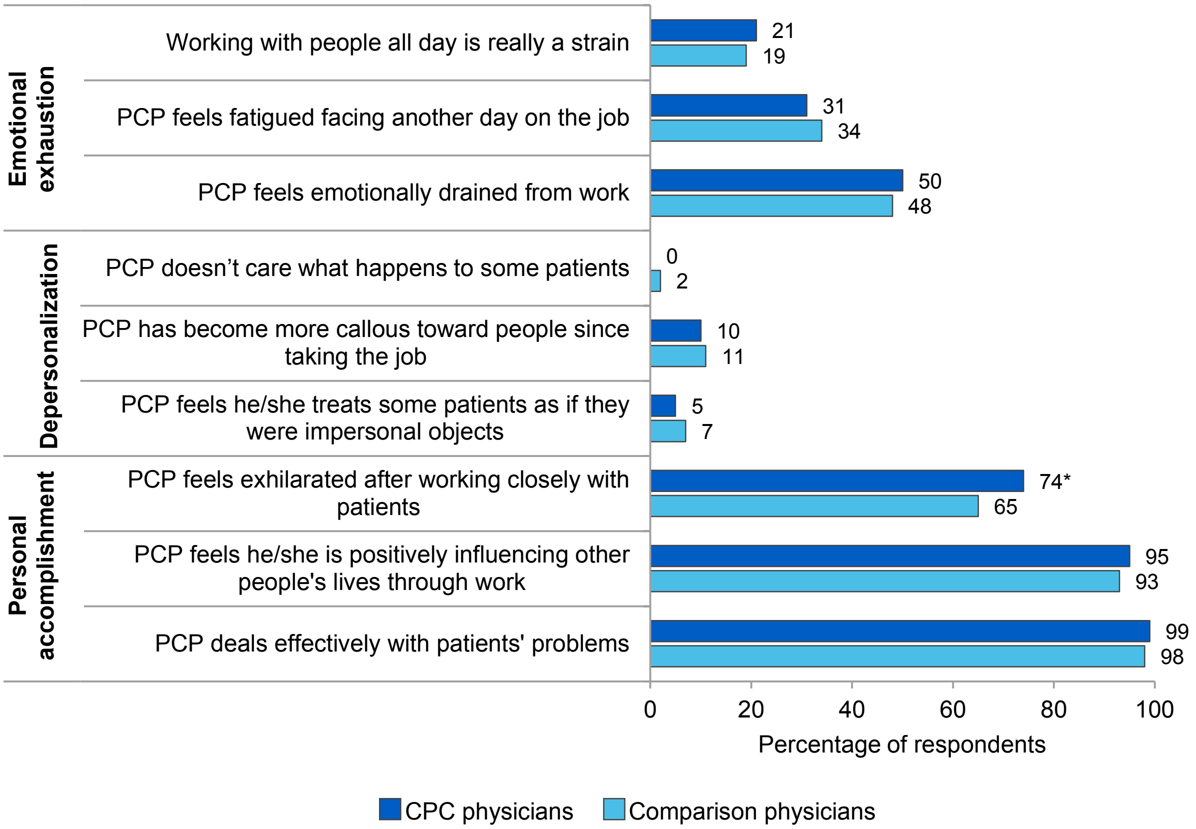
Source: Mathematica analysis of 2013 and 2016 CPC clinician surveys.

Notes: Respondents were asked how often they felt burned out from their work in the past year, a validated single-item measure of burnout (West et al. 2009, 2012).

Response distributions for these questions were not statistically significantly different between CPC and comparison physicians at the $p < 0.10$ level.

- Responses to the nine questions the survey included from three MBI subscales indicate similar findings—levels of burnout were generally similar for CPC and comparison physicians in 2016. There was one exception: on a question in the personal accomplishment composite measure, a higher proportion of physicians in CPC practices than in comparison practices reported feeling exhilarated after working closely with patients weekly or more (74 percent versus 65 percent) (Figure 6.3).
- CPC and comparison practice physicians more often reported weekly or more frequent symptoms of emotional exhaustion than depersonalization or lack of personal accomplishment (Figures 6.3 and 6.4), similar to the pattern identified in Shanafelt et al. (2015).

Figure 6.3. Percentage of physicians who say they agree with the statement on burnout once or more per week, CPC and comparison practices, 2016



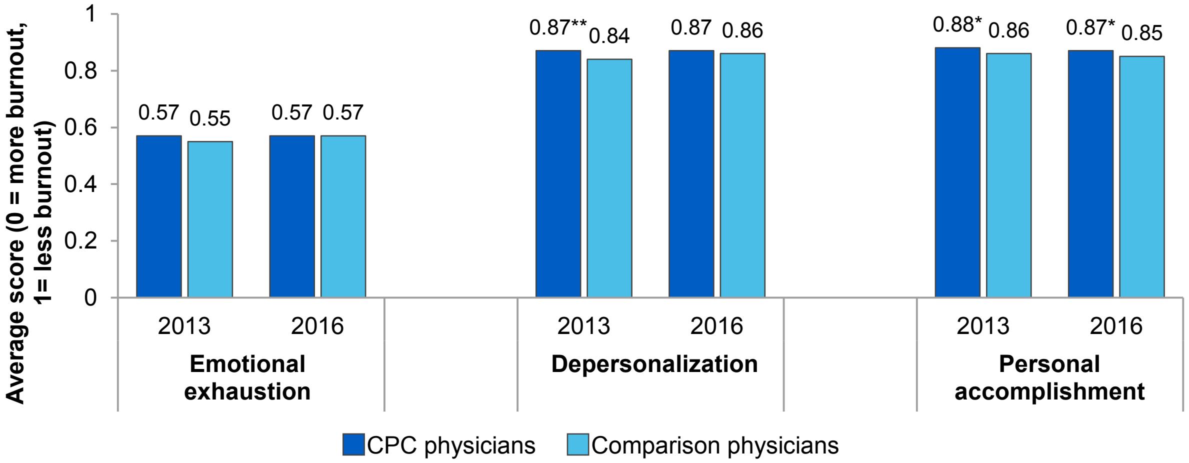
Source: Mathematica analysis of 2013 and 2016 CPC clinician surveys.

Notes: Responses shown include primary care physicians who responded that they feel this way about their job daily, a few times a week, or once a week.

* The distributions of responses were statistically significantly different between CPC and comparison physicians at the $p < 0.10$ level.

PCP = primary care physician

Figure 6.4. Physician scores on a subset of the Maslach Burnout Inventory scales (0 = more burnout, 1 = less burnout), CPC and comparison practices, 2013 and 2016



Source: Mathematica analysis of 2013 and 2016 CPC clinician surveys.

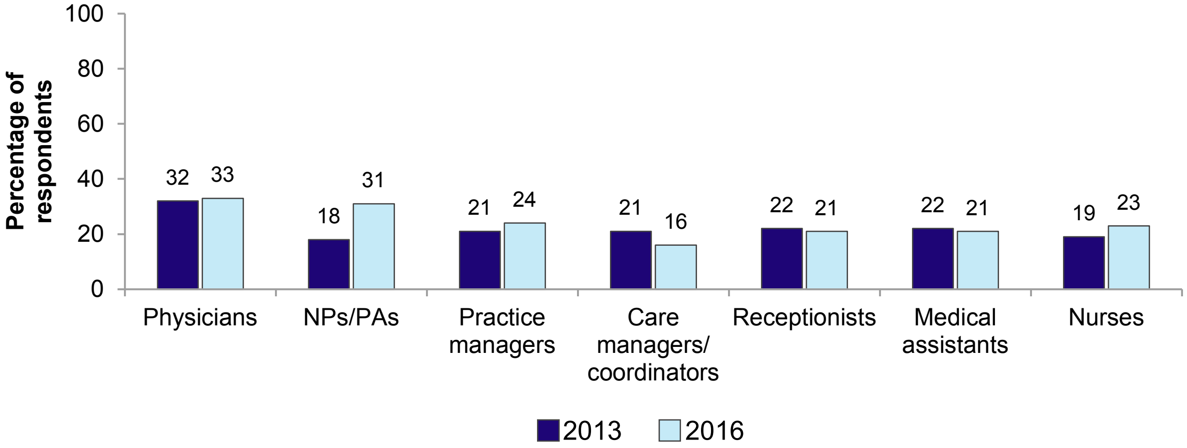
*/**/*** Average responses are significantly different between CPC and comparison physicians in the specified year at the 0.10/0.05/0.01 level, respectively.

- These findings suggest that burnout is an issue for physicians, but that physicians in CPC practices are not more burned out than physicians in comparison practices.
- Results of subgroup analyses show that CPC did not have a differential effect on the proportion of physicians with high burnout for subgroups of practices defined by the practice's system affiliation, size, or patient risk profile (see Appendix E, Table E.208). In addition, there were no effects on burnout of being in one of these subgroups for physicians in CPC and comparison practices combined.

CPC practices' clinicians and staff. Staff in CPC practices also experience burnout, but generally at lower levels than reported by physicians and NPs/PAs. A similar pattern is noted in the literature; for example, Edwards et al. (2017) found that 26 percent of physicians reported high levels of burnout, compared with 21 percent of NPs/PAs and 20 percent of other clinical staff; and Dolan et al. (2015) found that 45 percent of physicians, NPs, and PAs felt burned out weekly compared with 40 percent of RNs and 31 percent of clinical associates. As with physicians, participating in CPC's transformation work does not appear to have exacerbated staff burnout between 2013 and 2016.

- For example, in 2016, 24 percent or fewer practice managers, care managers, receptionists, medical assistants, and nurses reported that they were burned out compared with 31 percent of NPs and PAs and 33 percent of physicians (Figure 6.5). Over time, most ratings remained the same, although the percentage of NPs and PAs reporting high levels of burnout increased from 18 percent in 2013 to 31 percent in 2016 and decreased in care managers from 21 to 16 percent (note that we did not statistically test the differences in responses between different types of CPC clinicians and staff or over time, and therefore we cannot determine whether these changes are the result of unexplained variation due to the relatively small sample sizes or if they are "real" changes). In the case of care managers, the total number of care managers or coordinators in CPC practices grew dramatically in this period, from 104 in 2013 to 274 in 2016 (of these staff, 61 responded to this question in 2013 and 204 responded in 2016), making it hard to interpret their changed results over time.

Figure 6.5. Percentage of CPC practice members reporting high levels of burnout, 2013 and 2016



Source: Mathematica analysis of 2013 and 2016 CPC clinician and staff surveys.

Notes: Respondents were asked to, using their own definition of burnout, select one of five statements that best describes their situation at work. Following the literature, we define high levels of burnout as having one of the following three responses: (1) I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion; (2) the symptoms of burnout that I'm experiencing won't go away, and I think about frustrations at work a lot; and (3) I feel completely burned out, often wonder if I can go on, and I am at the point where I may need some changes or may need to seek some sort of help.

We did not statistically test the differences in responses between respondent type or over time.

6.3.2. Control over work

Physicians in CPC and comparison practices reported having comparable control over various aspects of their work, suggesting that CPC did not alter control over work. Within CPC practices, NPs/PAs and other CPC practice staff reported less control over work on various items in the control-over-work composite than physicians, except for practice managers, who reported having about the same or more control than physicians on each item.

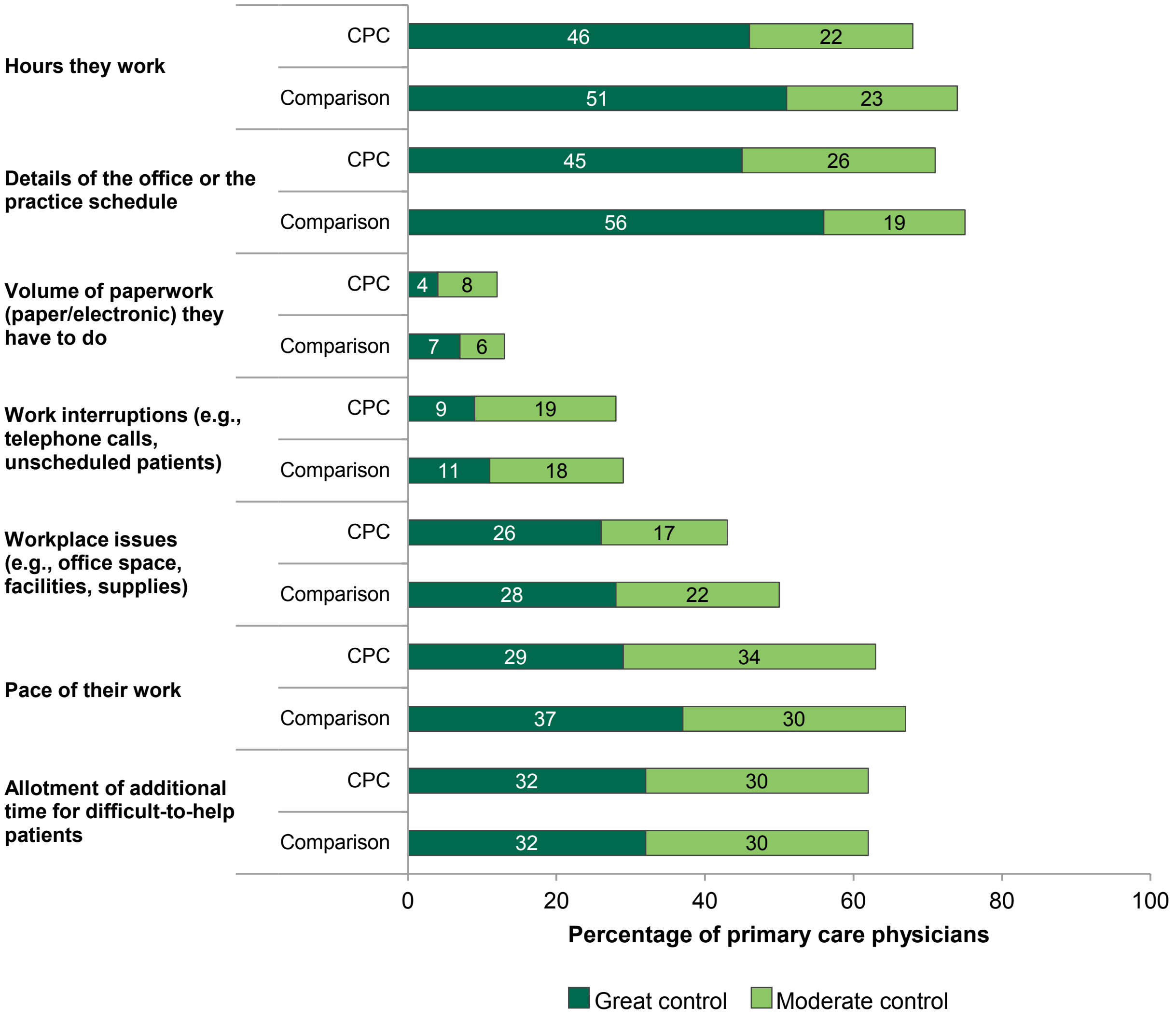
Physicians. Both CPC and comparison physicians reported comparable control over their work throughout the initiative.

- Physicians in both groups had an average composite score between 0.50 and 0.55 on a one-point scale in 2013 and 2016 (Appendix E, Table E.183).
- In 2016, CPC and comparison physicians reported having the most control over the hours they work and the details of the office or the practice schedule, and the least amount of control over work interruptions such as telephone calls and unscheduled patients, and the volume of paperwork they do (Figure 6.6).

- There was little change between 2013 and 2016 in the amount of control CPC and comparison physicians reported in the individual items measuring control, except for the amount of control the physician has over the allotment of additional time for difficult-to-help patients: for both CPC and comparison practices, the percentage of physicians that reported great control increased from 24 percent in 2013 to 32 percent in 2016, but it is unclear what factors drove the change (see Appendix E, Tables E.185–191).

- Results of subgroup analyses show that CPC did not have a differential effect on control over work for subgroups of practices defined by system affiliation, practice size, or patient risk profile (see Appendix E, Table E.184).
- For CPC and comparison physicians combined, system affiliation and practice size, but not patient risk profile, influenced control over work. Among CPC and comparison physicians combined, physicians that are not part of a health system reported more control over their work than physicians that were part of a system (0.59 versus 0.45 out of 1.0) (where higher scores represent more control); and physicians in smaller practices reported more control over their work than physicians in larger practices (0.61 for solo clinician practices versus 0.52 to 0.53 for practices with more clinicians) (see Appendix E, Table E.184).

Figure 6.6. Percentage of physicians reporting great or moderate control over various aspects of their work, CPC and comparison practices, 2016

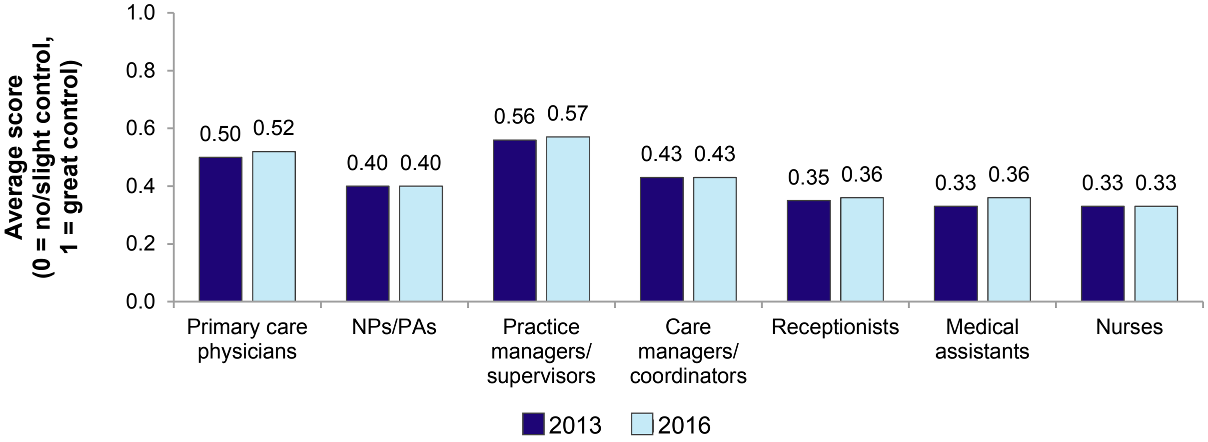


Source: Mathematica analysis of 2013 and 2016 CPC clinician surveys.

Note: Response distributions for these questions were not statistically significantly different between CPC and comparison physicians in the given year at the $p < 0.10$ level.

CPC practices' clinicians and staff. NPs/PAs and staff reported less control over work on various items in the control-over-work composite than physicians. The one exception is practice managers, who reported having slightly more control than physicians on the composite measure (Figure 6.7).

Figure 6.7. Overall scores on the control-over-work summary composite for CPC practice members, 2013 and 2016



Source: Mathematica analysis of 2013 and 2016 CPC clinician and staff surveys.

Note: We did not statistically test the differences in responses between respondent type or over time.

6.3.3. Alignment of work with training

Physicians in CPC and comparison practices reported similar alignment of work with their training, suggesting that CPC did not alter this area. Within CPC practices, physicians, NPs/PAs, and staff indicate that their work is generally well-matched to their training, although there remains room for improvement in delegation of tasks and additional training.

Physicians. According to physician and staff reports, there was no effect of CPC on alignment of work with training using three measures.[63]

- For the first measure, 65 percent of physicians in CPC and comparison practices surveyed in 2016 reported that they spend 75 percent or more of their time doing work well-matched to their training (Figure 6.8). Although this finding suggests more room for delegation of tasks, CPC did not appear to alter delegation.
- Results of subgroup analyses show that CPC may have had a positive differential effect on how well-matched physicians report their work is to their training depending on whether the physician was in a system-affiliated practice. The difference in the percentage of physicians reporting that 75 percent of more of their time is spent doing work that is well matched to their training between physicians in practices affiliated with systems compared to physicians

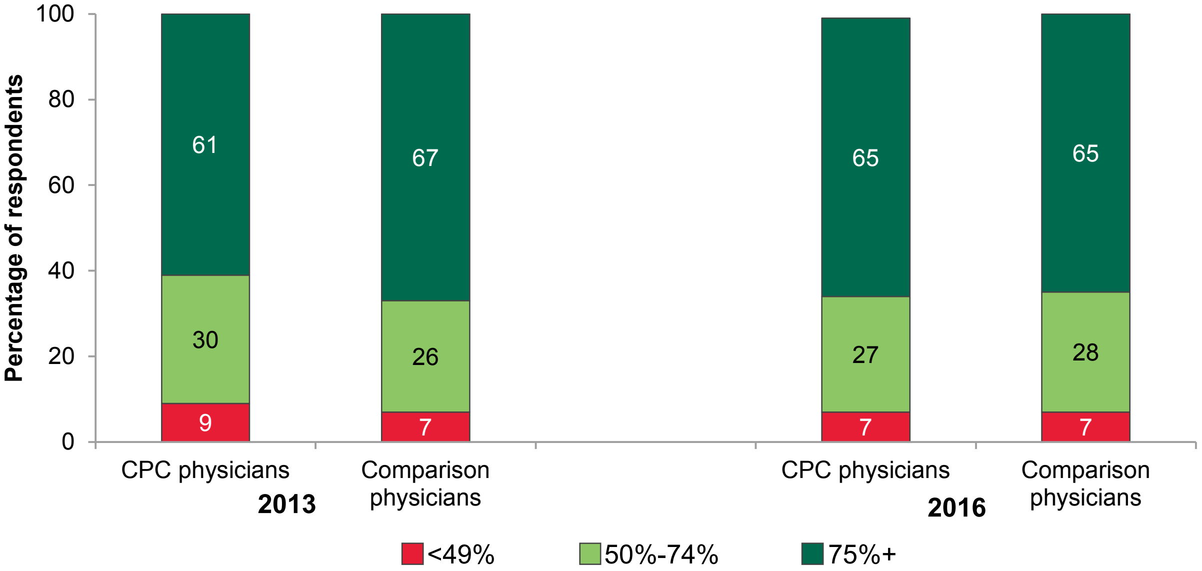
---

[63] For the questions in this section, the text and figures exclude responses of does not apply and don't know. Appendix E, Tables E.174–182 present percentages with and without these responses.

in practices not affiliated with systems was smaller for CPC practices (65 percent and 66 percent) than comparison practices (55 percent and 72 percent). CPC did not have a differential effect for subgroups of practices defined by practice size or patient risk score (see Appendix E, Table E.182).

- For CPC and comparison physicians combined, 69 percent of physicians not in a system versus 60 percent of those in a system reported that 75 percent or more of their time is spent doing work that is well matched to their training. There were no differences across practices of different sizes or with different patient risk profiles (see Appendix E, Table E.182).

Figure 6.8. Proportion of time each week that physicians do work that is well-matched to their training, CPC and comparison practices, 2013 and 2016



Source: Mathematica analysis of 2013 and 2016 CPC clinician surveys.

Notes: These estimates exclude physicians who answered does not apply or don't know. Between 0 and 2 percent of physicians responded does not apply or don't know depending on group and survey round.

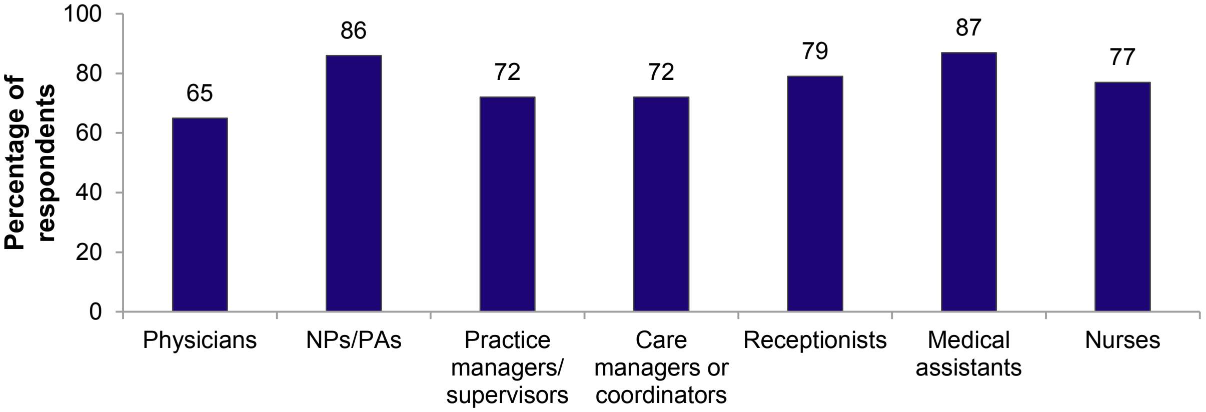
Response distributions were not statistically significantly different between CPC and comparison physicians in the given year at the $p < 0.10$ level.

- Results from the second measure indicate that most physicians did not believe they needed more training to do their work. When asked about the proportion of their work for which they *do not have enough training*, 95 percent of both CPC and comparison physicians indicated it was less than 25 percent of their time, and between 1 and 2 percent of physicians in CPC and comparison practices suggested it was 50 percent or more of their time (item E2b) (see Appendix E, Table E.178). Results from the third measure support the need for more delegation of tasks in both CPC and comparison practices. When asked how much time they spend in a typical week doing work that could be done by someone with less training, 47 percent of CPC physicians and 52 percent of comparison physicians reported that it was at least 25 percent of their time (see Appendix E, Table 175).

- For CPC and comparison physicians combined, 56 percent of physicians in a system versus 47 percent of those not in a system reported that at least 25 percent of their time is spent doing work that could be done by someone with less training. There were no differences across practices of different sizes or with different patient risk profiles (see Appendix E, Table E.176).

CPC practices' clinicians and staff. Depending on the respondent type, 72 to 87 percent of NPs/PAs and staff report that at least 75 percent of their time is spent doing work well-matched to their training, compared with 65 percent of CPC physicians (Figure 6.9).

Figure 6.9. Percentage of CPC practice members saying that 75 percent or more of their time is spent doing work *that is well-matched to their training*, 2016



Source: Mathematica analysis of 2016 CPC clinician and staff surveys.

Notes: These estimates exclude respondents who answered does not apply or don't know. The percentage of respondents responding does not apply or don't know ranges from 0 to 6 percent depending on staff type.

We did not statistically test the differences in responses between respondent type.

When asked about a different measure, how much of their time is spent doing work that could be done by someone with less training, responses suggest room for improvement with delegation of tasks. For example, 53 percent of CPC physicians, 29 percent of CPC NPs/PAs, and 57 percent of CPC nurses surveyed said that they spend 25 percent or more of their time each week doing work that work could be done by someone with less training. Between 40 and 49 percent of other CPC staff also reported that they spend more than a quarter of their time each week doing work that could be done by someone with less training.

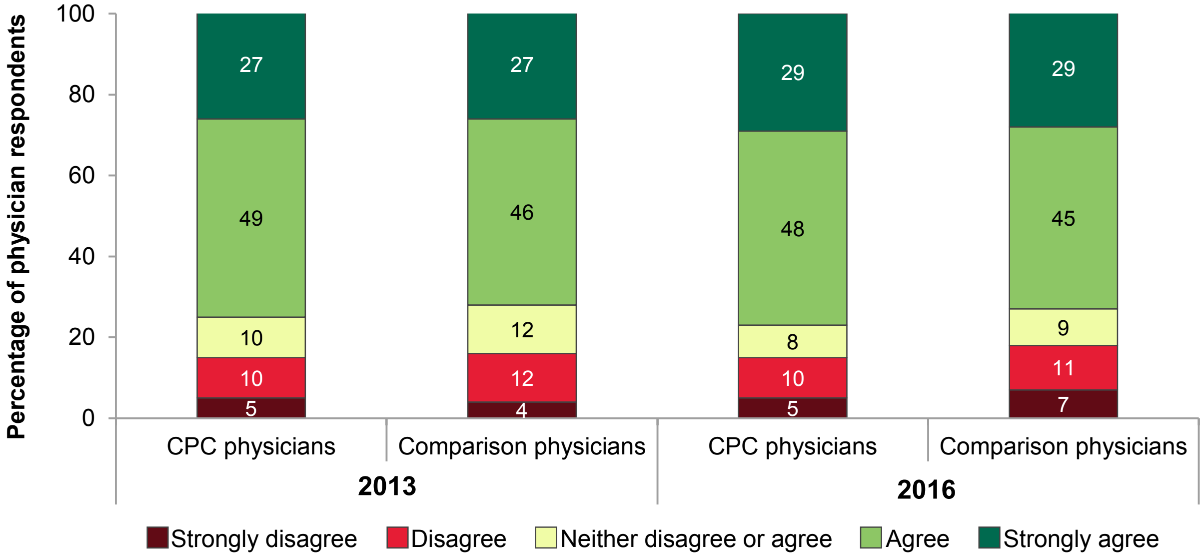
6.3.4. Satisfaction with work

CPC did not appear to affect the satisfaction of physicians with their jobs; a comparable three-quarters of both CPC and comparison group physicians reported being satisfied with their jobs. Within CPC practices, CPC NPs/PAs and staff generally reported higher satisfaction with their jobs than physicians.

Physicians. Job satisfaction is comparable among CPC and comparison group physicians.

- In 2016, more than three-quarters of CPC physicians agreed (48 percent) or strongly agreed (29 percent) that they were satisfied with their current job (Figure 6.10). Only about 15 percent disagreed or strongly disagreed with the statement, and the remainder neither agreed nor disagreed. Satisfaction was similar across CPC and comparison physicians and survey rounds. This result is comparable to studies indicating overall rates of physician and primary care physician satisfaction at about 80 percent (Caloyeras et al. 2016; Christopher et al. 2014).

Figure 6.10. Extent of physician agreement with statement, "Overall I am satisfied with my current job," CPC and comparison practices, 2013 and 2016



Source: Mathematica analysis of 2013 and 2016 CPC clinician surveys.

Note: Response distributions were not statistically significantly different between CPC and comparison physicians in the given year at the $p < 0.10$ level.

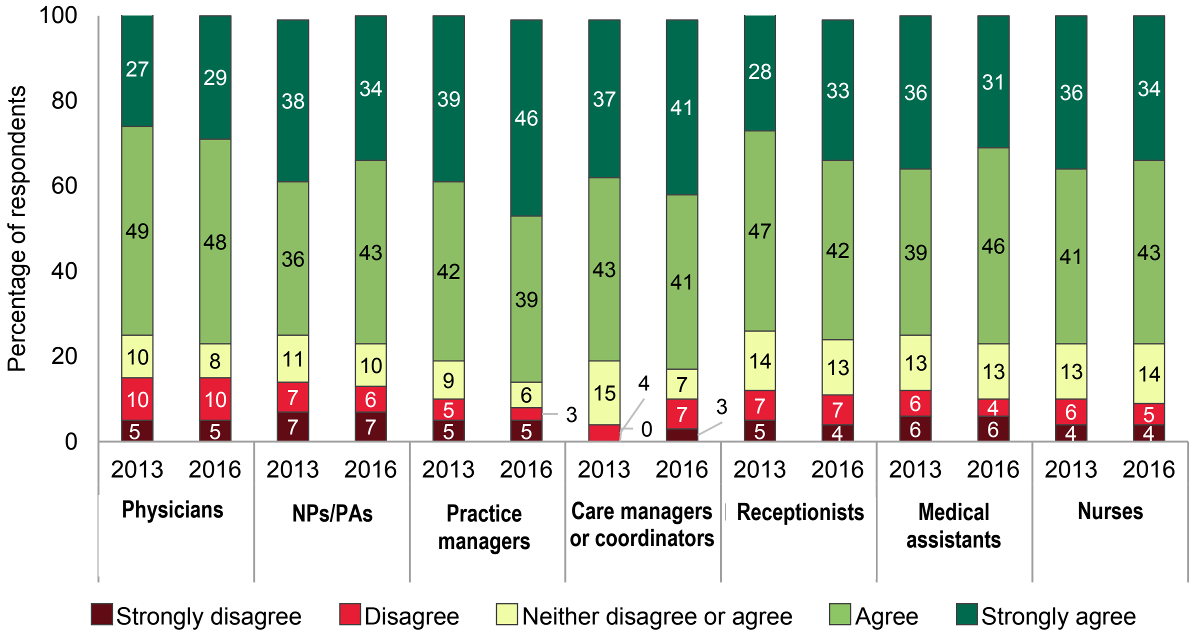
The columns may not add up to 100 percent due to rounding.

- About 15 percent of CPC and comparison physicians reported in 2016 that they were likely or definitely leaving their current practice in the next two years; more than half of these physicians were age 60 or older. Reasons for leaving included retirement, high workload, career advancement, moving, inadequate compensation or benefits, poor management, and "too many regulations." Results were similar between CPC and comparison physicians and in 2013 and 2016.

- Results of the subgroup analyses show that CPC did not have a differential effect on physicians’ satisfaction with their job or plans to leave their practice in the next two years for subgroups of practices defined by system affiliation, practice size, or patient risk score (see Appendix E, Table E.193 and Table E.211).
- Turning to the results of being in the subgroup or not for CPC and comparison physicians combined, physicians whose practice is not in a system were more likely to be satisfied with their job than physicians whose practice is in a system (78 versus 71 percent of physicians). Physicians whose practice had higher-risk beneficiaries (that is, they had higher average HCC scores) were more likely to be satisfied with their job than physicians in practices with lower-risk beneficiaries (78 versus 72 percent). There were no differences across practices of different sizes and job satisfaction. There were also no differences in physicians’ plans to leave their practice in the next two years across physicians in subgroups of practices defined by system affiliation, size, or patient risk profile (see Appendix E, Table E.193 and Table E.211).

CPC practices’ clinicians and staff. In 2016, more than three-quarters of CPC physicians, NPs and PAs, and staff reported that they agreed or strongly agreed that they were satisfied with their jobs (Figure 6.11). The proportion of staff who reported disagreeing or strongly disagreeing with a statement that they were satisfied with their job ranged from 8 to 11 percent, which was slightly lower than the proportion among physicians (15 percent) and NPs and PAs (13 percent). Satisfaction for each type of respondent was similar in 2013 and 2016.

Figure 6.11. Extent of agreement with statement, “Overall I am satisfied with my current job,” by CPC practice members, 2013 and 2016



Source: Mathematica analysis of 2013 and 2016 CPC clinician and staff surveys.

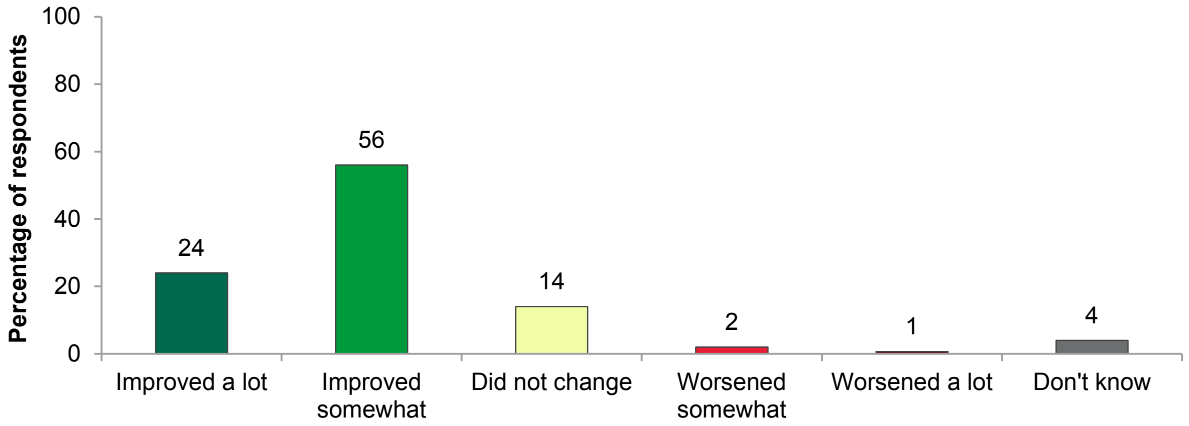
Notes: We did not statistically test the differences in responses between respondent type or over time. The columns may not add up to 100 percent due to rounding.

6.3.5. Ratings of CPC in 2016 among CPC practice members

CPC physicians and staff had largely positive views about their experiences participating in CPC.

Influence of CPC on quality of care. In 2016, at least 75 percent of each type of clinician and staff indicated that CPC improved the quality of care or service for their patients somewhat or a lot (see Appendix E, Table E.237). The one exception is receptionists, a large share of whom replied that they do not know. Among physicians, just over half indicated that CPC had improved the quality of care or service somewhat, and another 24 percent thought it had improved it a lot (Figure 6.12). Responses of NPs/PAs and staff were generally comparable to physicians, with somewhat higher percentages of staff saying that CPC had improved the quality of care a lot. For example, 54 percent of practice managers and 53 percent of care managers said CPC improved quality of care *a lot*, versus 24 percent of physicians and NPs/PAs. Very few respondents in any category (no more than 1 to 3 percent) thought CPC had worsened quality of care in any way, and a small proportion (14 percent of physicians, 12 percent of NPs/PAs, and 3 to 6 percent of staff) thought that CPC had not resulted in any change in the quality of care for their patients.

Figure 6.12. CPC physician reports of how CPC participation changed the quality of care or service provided to patients, 2016

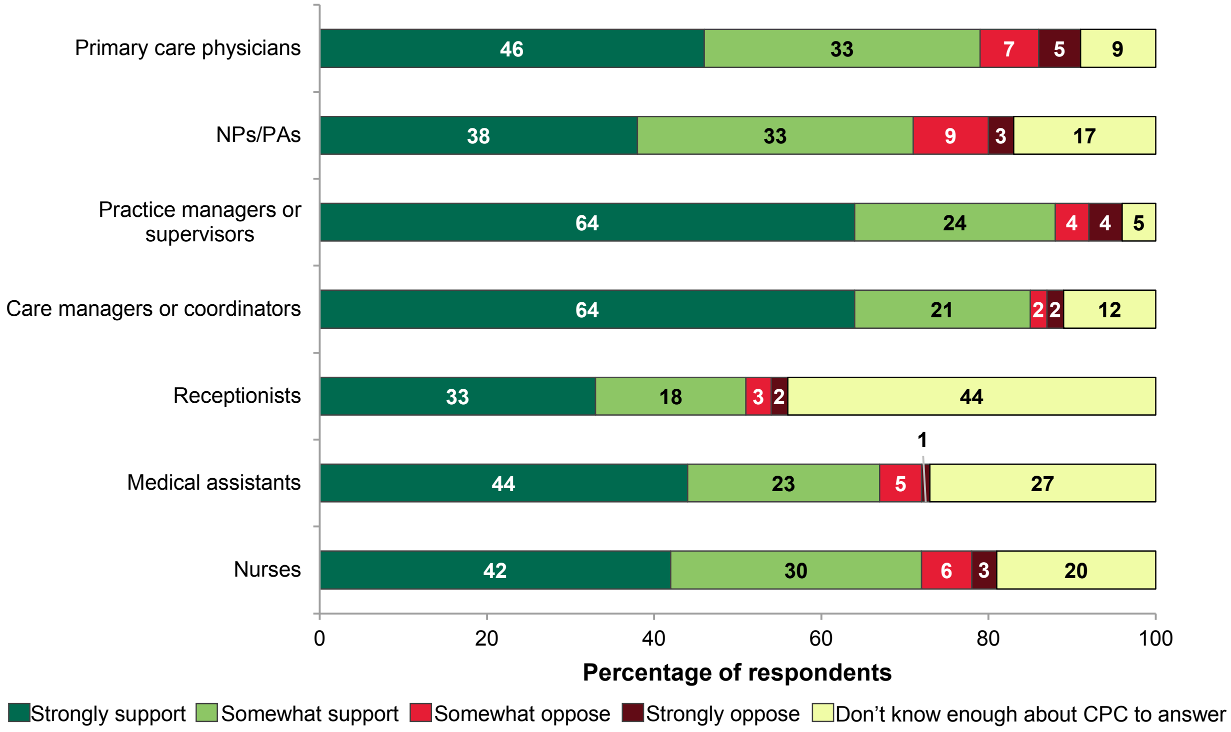


Source: Mathematica analysis of 2016 CPC clinician surveys.

Results of subgroup analyses show that there was no difference in the percentage of physicians reporting that participation in the CPC initiative improved the quality of service and care they provide their patients somewhat or a lot across system affiliation, practice size, or patient risk score (see Table E.238 in Appendix E).

Support for CPC. Ratings of CPC were largely favorable. The 2016 survey asked CPC clinicians and staff to consider whether, knowing what they now know, they would support or oppose the practice's participation in CPC if they could go back in time to when CPC was announced in 2012. Forty-six percent of CPC physicians and 38 percent of CPC NP/PA respondents would be strongly supportive, and another 33 percent of each said they would be somewhat supportive (Figure 6.13, Appendix E, Table E.239). Even larger percentages of practice managers and care managers (each 64 percent) would be strongly supportive of participation, and another 21 percent or more would be somewhat supportive. Across respondent types, 5 percent or fewer indicated they would be strongly opposed to participation in CPC, with slightly higher percentages saying they would somewhat oppose participation (between 2 and 9 percent). The degree of physicians' support of CPC participation is consistent with the large number of CPC practices that applied to participate in CPC+. Ninety-eight percent of practices that were still participating in the initiative at the end of CPC applied for and were selected to participate in CPC+. See Chapter 2, Section 4 for more details.

Figure 6.13. CPC practice members' reports of how much they would support or oppose their practice's participation in CPC if they could do it all over again, 2016



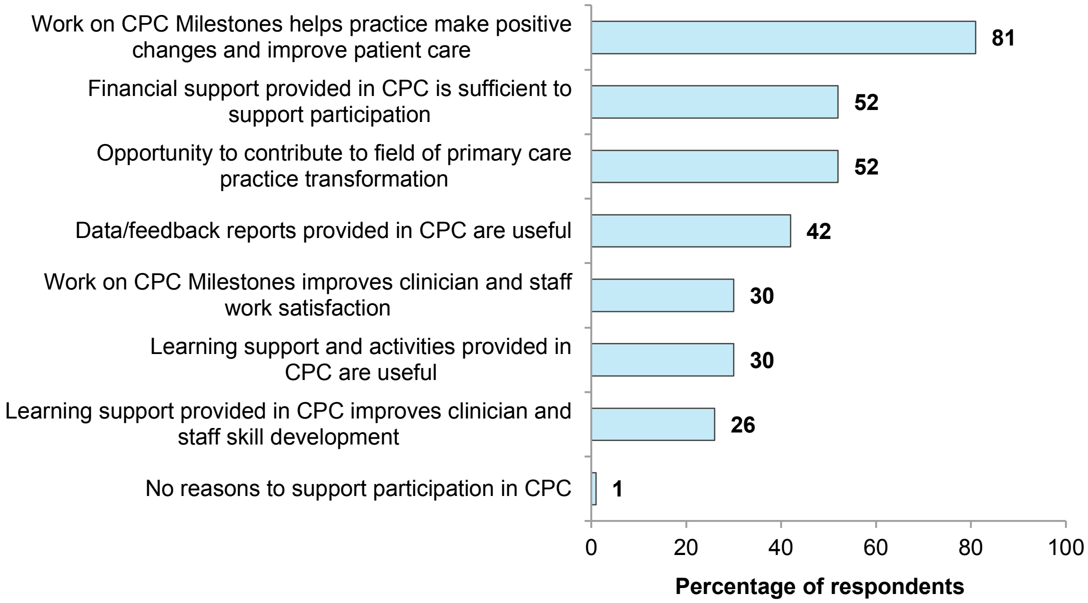
Source: Mathematica analysis of 2016 CPC clinician and staff surveys.

Note: We did not statistically test the differences in responses between respondent types.

Results of subgroup analyses show that CPC physicians in solo clinician practices and CPC physicians in practices with more high-risk beneficiaries were more likely to report that they would be strongly supportive of their practice's participation in CPC than those in larger practices or in practices with lower-risk beneficiaries. Sixty-three percent of physicians in solo practices versus 43 to 46 percent of physicians in larger practices reported that they would strongly support their practice's participation in CPC, knowing what they know now, and 51 percent of physicians in practices with higher-risk beneficiaries versus 40 percent of physicians in practices with lower-risk beneficiaries would strongly support their practice's participation. During interviews with the deep-dive practices, we heard that physicians in larger practices were less likely to see the financial support from CPC at the practice level and were more likely to be told (by their system) that they will participate in CPC compared with small independent practices. These findings suggest that larger practices may not have had the same level of physician buy-in as small independent practices. There was no difference in the proportion of physicians reporting strong support for CPC participation in subgroups of practices defined by system affiliation or patient risk score (see Appendix E, Table E.240).

Reasons for supporting CPC. Respondents were given seven specific potential reasons (as well as an "other" category) and asked to indicate all main reasons they would support participation in the CPC initiative. Among physicians who would have supported participation in CPC if they could do it over again,[64] by far the most commonly selected reason for supporting participation in CPC was that work on CPC Milestones helped the practice make positive changes and improve patient care, cited by 81 percent of physicians (Figure 6.14 reports responses for physicians; responses of all respondents are reported in Appendix E, Table E.242). Roughly half of these physicians cited two other reasons as important: (1) the opportunity to contribute to the field of primary care practice transformation and (2) that financial support provided in CPC is sufficient to support participation; 42 percent cited the usefulness of data feedback; and between one-quarter and one-third cited Milestone work improving clinician and staff work satisfaction, useful learning support, and learning support improving skill development.

Figure 6.14. Percentage of CPC physicians reporting each factor as a main reason for supporting participation in CPC, among those that would support participating again, 2016



Source: Mathematica analysis of 2016 CPC clinician and staff surveys.

Notes: Respondents could also select "other" and specify a reason not listed; although not shown on the figure, 7 percent of physician respondents selected the other response option.

---

[64] We excluded respondents that reported not knowing enough about CPC to support or oppose their practice's participation.

Turning to responses of other practice members, we focus on the responses of those who answered this question and would have supported participation in CPC if they could do it over again. In general, NP/PA respondent views were comparable to physicians, though NPs/PAs were less likely than physicians to report financial support is sufficient to support participation as a major reason. Among the different staff types, respondents tended to place more emphasis than physicians and NPs/PAs on Milestone work improving clinician and staff satisfaction, and the importance of learning support and activities provided in CPC. Specifically, 36 to 54 percent of other staff versus 24 to 30 percent of physicians and NPs/PAs indicated that CPC learning support is useful, and that learning support improves clinician and staff skills development, were major reasons for supporting CPC. Similarly, 44 to 54 percent of staff, depending on the respondent type, versus 30 percent of both CPC physicians and NPs/PAs said that improved clinician and staff satisfaction through the work on the CPC Milestones was a major reason for their support.

Reasons for opposing CPC. Respondents were also asked about six major reasons (as well as an "other" category) they would have for opposing their practice participating in CPC, knowing what they know now (Figure 6.15 reports responses for physicians; responses of all respondents are reported in Appendix E, Table E.244). Among the small proportion of physicians who answered this question about reasons for opposing CPC and would have been *opposed* to participating in CPC if they could do it all over again,[65] the largest proportion (66 percent) reported that CPC does not substantially improve patient care, followed by the reporting requirements are too burdensome (58 percent), financial support is insufficient to support participation (58 percent), the work involved in implementing the Milestones is too burdensome (56 percent), and staffing is insufficient to participate in CPC (31 percent).[66]

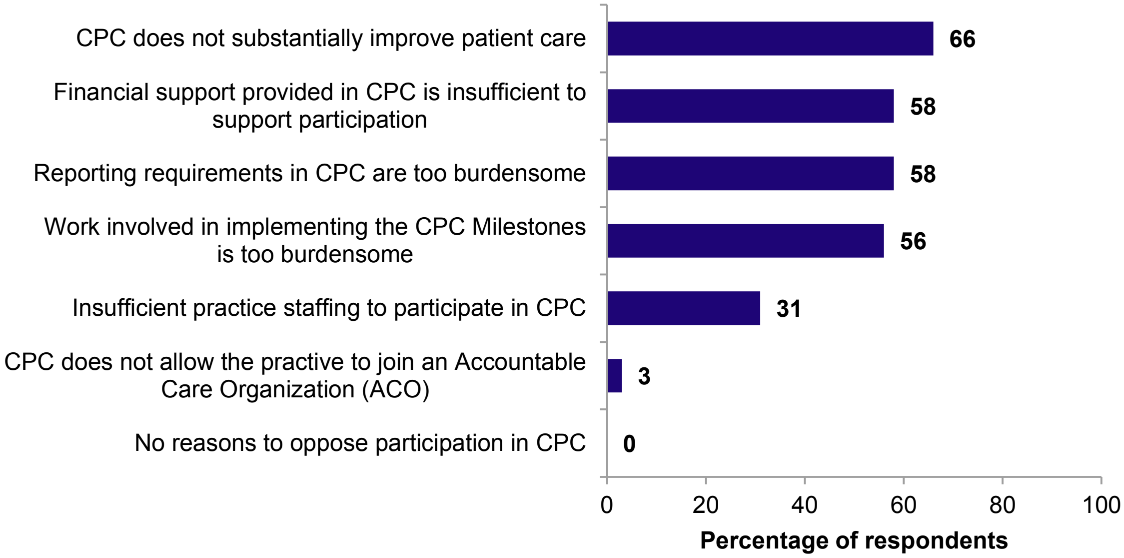
It is worth noting that even among physicians who said they would support CPC participation if they could do it again, many also cited the burden of CPC: 44 percent cited administrative requirements, while 34 percent cited the difficulty of implementing the Milestones (Appendix E, Table E.244).

---

[65] We excluded respondents that reported not knowing enough about CPC to support or oppose their practice's participation.

[66] The numbers of NPs/PAs and other staff that would oppose participation in CPC is small (between 9 and 39 respondents depending on the staff type). Although we do not discuss the responses of other staff separately here, more detail is available in Appendix E, Table E.244.

Figure 6.15. Percentage of CPC physicians reporting each factor as a main reason for opposing participation in CPC, among those that would oppose participating again, 2016



Source: Mathematica analysis of 2016 CPC clinician and staff surveys.

Notes: Respondents could also select “other” and specify a reason not listed; although not shown on the figure, 15 percent of physician respondents selected the other option.

6.4. Discussion

Physicians in CPC and comparison practices reported similar burnout, control over work, alignment of work with training, and work satisfaction in 2016, the last year of CPC. There was no differential effect of CPC on most measures of physician experience for physicians whose practices were in a system, were larger (measured by having more primary care clinicians), or served attributed Medicare beneficiaries with a higher risk score (measured by the average HCC score among attributed Medicare FFS beneficiaries in their practice). Responses were also similar over time for each respondent type in the CPC practices. Together, these findings indicate that CPC did not affect these aspects of clinician and staff experience.

Although CPC did not appear to affect clinician and staff experience, we did find differences between physicians in both CPC and comparison practices depending on whether their practice was part of a system, the size of their practice, and the risk profile of their practice’s patients. For CPC and comparison physicians combined, physicians whose practice was part of a system reported less control over their work, spending less time doing work that was well matched to their training, spending more time doing work that could be done by someone with less training, and less satisfaction with their current job than physicians whose practices were not part of a system. There were fewer differences between physicians depending on practice size and patient risk profile. For CPC and comparison physicians combined, physicians in larger practices reported less control over their work than physicians in solo clinician practices; and physicians in practices with lower-risk beneficiaries were less likely to report being satisfied with their current job than physicians in practices with higher-risk beneficiaries.

CPC clinicians and staff had largely positive views about their experiences participating in CPC. Many believed that CPC improved quality of care and cited improved patient care; the opportunity to contribute to primary care practice transformation; and the benefits of financial support, data feedback, and learning supports as reasons they would support participation in CPC. Still, even CPC supporters provided responses indicating the burden of administrative reporting and the difficulty of the transformation work in CPC. For example, among the 85 percent of physicians who would have *supported* participating in CPC if they could do it over again and answered a question about reasons they might oppose the initiative, 44 percent reported burdensome administrative requirements, about one-third cited the work involved in implementing the Milestones and inadequate financial support, and one-quarter reported inadequate staffing.

Although the evidence suggests that CPC did not adversely affect physician and staff experience, future care delivery initiatives nonetheless could work with practices to reduce burnout, improve delegation, and streamline administrative work. Two recent systematic reviews that evaluate the effectiveness of interventions to reduce burnout in physicians found that programs to reduce burnout in physicians were associated with small but statistically significant impacts (Panagioti et al. 2017; West et al. 2016). For example, one of these studies found that organizational changes—such as fostering communication between members of the health care team, and cultivating a sense of teamwork and job control—were more effective in reducing burnout than interventions targeted to improving personal coping strategies (Panagioti et al. 2017). Similarly, a cluster randomized control study of 166 primary care clinicians in 24 clinics found that improved workflows and targeted quality improvement projects decreased physician burnout, while physician satisfaction improved more often in the clinics that participated in communication and workflow interventions (Linzer et al. 2015).

7. HOW DID CPC AFFECT THE EXPERIENCES OF MEDICARE FFS BENEFICIARIES?

Patient-centeredness was a core tenet of the CPC initiative, and several aspects of CPC aimed to improve patient experience through the transformation of care delivery. Specifically, practices were expected to improve access to care, engage patients to guide quality improvement through regular patient surveys and/or a patient and family advisory council (PFAC), integrate into usual care culturally competent self-management support and shared decision making tools, and coordinate care across the medical neighborhood. Practices were also encouraged to use a personalized plan of care for high-risk patients. In addition, CMS and some other participating payers used patient experience as an element in determining practice eligibility for shared savings payments.

This chapter examines how CPC affected the experiences of Medicare fee-for-service beneficiaries with care over the four years of the initiative. We present results based on responses from more than 25,000 beneficiaries in roughly 500 CPC practices and 8,000 beneficiaries in roughly 800 comparison practices. The survey is based on the Clinician and Group Consumer Assessment of Healthcare Providers and Systems 12-Month Survey with Patient-Centered Medical Home supplemental items (CAHPS PCMH, version 2.0) and supplemented with several questions about specific aspects of CPC. We examine how patient ratings of CPC practices compare with ratings of comparison practices in 2013 (8 to 12 months after CPC began) and again in 2016 (5 months before CPC ended). Appendix F describes the survey sampling, fielding, content, and analysis methods in more detail and contains tables showing the results.

7.1. Key takeaways on the effect of CPC on the experiences of Medicare beneficiaries

Despite CPC practices undergoing substantial changes to improve care delivery, beneficiaries' experiences with care at CPC practices were generally no different from experiences at comparison practices toward the end of the four-year initiative. There were no differential effects of CPC on beneficiaries who (1) were in practices in systems, (2) were in larger practices (measured by having more primary care clinicians), or (3) had higher risk scores. There were three exceptions.

- CPC improved transitional care *after hospital stays.* Patient ratings indicated that CPC practices provided timely follow-up to more beneficiaries after their hospital stays than did comparison practices. In 2016, 60 percent of beneficiaries in CPC practices compared to 50 percent of beneficiaries in comparison practices reported that their provider's office contacted them within three days of their most recent hospital stay.
- CPC improved transitional care *after ED visits.* Beneficiaries in CPC practices were more likely to report timely follow-up after emergency department (ED) visits. In 2016, 59 percent of beneficiaries in CPC practices compared to 51 percent of beneficiaries in comparison practices that visited the emergency department in the past year reported that their provider's office contacted them within one week of their visit.

- CPC might have unfavorably affected timely email response to patient questions. In 2016, fewer beneficiaries in CPC practices than in comparison practices reported that they always received an answer to their medical question as soon as needed when emailing their provider in the past 12 months (69 percent of beneficiaries in CPC practices compared to 75 percent of beneficiaries in comparison practices). However, fewer than 8 percent of beneficiaries in CPC and comparison practices reported emailing their provider and thus could answer this question.

7.2. Methods

7.2.1. Survey content and measures

The patient survey instrument contains questions from the CAHPS PCMH version 2.0 (Agency for Healthcare Research and Quality 2015). The CAHPS PCMH survey gauges patients' experiences over the previous 12 months across six domains of primary care: (1) patients' ability to get timely appointments, care, and information; (2) providers' communication with patients; (3) providers' knowledge of the care patients received from other providers; (4) providers support patients in caring for their own health; (5) providers discuss medication decisions with patients; and (6) patients' overall rating of their primary care provider. To help summarize patient experiences, we created six composite summary measures using 19 questions following the CAHPS Clinician and Group Survey scoring instructions (Agency for Healthcare Research and Quality 2012). Table 7.1 details the patient care experiences that the six summary composite measures evaluate. The CAHPS questions focused on care provided by the provider during visits, which is only one aspect of care that CPC aimed to affect. It did not ask about other aspects of care that CPC aimed to transform, such as team-based care or care provided regardless of whether it was in the office, or through phone, email, text, video, or group visits.

Table 7.1. Experiences included in the patient survey composite measures

Timely appointments, care, and information (five questions)

How often the patient:

- Got an appointment as soon as needed when phoning the provider's office for care needed right away
- Got an appointment as soon as needed when making an appointment for check-up or routine care
- Received timely answers to medical questions when phoning the provider *during* regular office hours
- Received timely answers to medical questions when phoning the provider *after* regular office hours
- Saw the provider within 15 minutes of appointment time

Providers' communication with patients (six questions)

How often the provider:

- Provided the patient with clear and easy to understand explanations
- Listened carefully to the patient's health questions and concerns
- Provided the patient with easy-to-understand instructions and information
- Knew important information about the patient's medical history
- Showed respect for what the patient had to say
- Spent enough time with the patient

Providers' knowledge of the care patients received from other providers (two questions)

How often the provider seemed informed and up to date on care the patient received from specialists

Whether practice staff spoke with the patient at each visit about all of the patient's prescription medications

Table 7.1 *(continued)*

Providers support patients in taking care of their own health (two questions)

Whether someone in the provider's office:

- Discussed with the patient specific goals for the patient's health
- Asked the patient whether there are things in life that make it hard for the patient to take care of his or her health

Providers discuss medication decisions with patients (three questions)

If the provider talked with the patient about starting or stopping a prescription medicine, how often the provider:

- Discussed reasons the patient might want to take the medicine
- Discussed reasons the patient might *not* want to take the medicine
- Asked the patient what he or she thought was best for him or her

Patients' rating of the provider (one question)

Patient rated the provider on a scale of 0 to 10, with 0 being the worst and 10 being the best

We assessed how well questions within each composite measure produced consistent results by calculating the internal consistency reliability of each composite. We calculated this value for the five composite measures formed from the responses to multiple questions (the composite measure for the remaining composite, patients' rating of the provider, contains only one question). Four of the five composite measures had adequate reliability with McDonald's omega values between 0.76 and 0.96. The other composite—providers' knowledge of the care patient received from other providers—had less reliability (omega = 0.56) (Nunnally and Bernstein 1994; Lance 2006). Because its two component questions do not fit well together in the composite, we report the questions separately.

In addition to the 17 questions included in the five summary composite measures (the four with adequate reliability and the one single-question composite), the surveys included 30 other questions that asked about patient experience, for a total of 47 questions. Because of changes in the Milestones and research priorities over time, 11 of the 30 questions were not included in all four rounds (see Table 7.2). For these questions, we cannot calculate CPC-comparison differences for 2013 and instead calculate CPC-comparison differences for the first year the question was asked. We discuss our methods for analysis in Section 7.2.4. See Appendix F, Table F.4 for a list of all 47 patient survey questions.

Table 7.2. Number of questions that gauge patient experience in survey

	Number of questions
In five composites and in all four rounds	17
Not in composites	30
…In one round	*4*
…In two rounds	*1*
…In three rounds	*6*
…In four rounds	*19*
Total	**47**

7.2.2. Survey administration

We administered four rounds of the CPC patient survey by mail during the 51-month initiative (Table 7.3). We did not offer incentive payments.

Table 7.3. CPC patient survey rounds and fielding dates

Round	Fielding period	Months after CPC began
1	June through October 2013	8–12
2	July through October 2014	21–24
3	July through October 2015	33–36
4	July through October 2016	45–48

7.2.3. Survey sample and response rates

We administered the survey to a cross-sectional sample of Medicare FFS beneficiaries attributed to CPC and comparison practices.[67] We invited about 60,000 of the roughly 300,000 Medicare FFS beneficiaries attributed to CPC and 20,000 of the approximately 600,000 beneficiaries attributed to comparison practices to respond to the patient survey each round.[68] Using Medicare claims data, Medicare beneficiaries were attributed to practices where they received the plurality of selected evaluation and management visits to primary care clinicians over the prior two years. We sampled Medicare FFS beneficiaries in all practices that had ever participated in CPC and were still open, regardless of whether the practice was still participating in CPC at the time of the survey. Each round, we excluded practices that had closed more than six months before the survey round; only 7 (or 1 percent of) CPC practices were excluded from our sample for this reason.

In each survey round, we obtained response rates between 44 and 48 percent for CPC and comparison practices. Using survey responses, we then identified attributed Medicare beneficiaries who had visited the practice at least once in the 12 months before the start of the survey round to be included in the analytic sample. For each round of data collection, our analytic sample included more than 25,000 Medicare FFS beneficiaries attributed to between 490 and 496 CPC practices and 8,000 Medicare FFS beneficiaries attributed to between 736 and 818 comparison practices, depending on the round. (See Appendix F, Table F.3 for detailed information on the samples and response rates over time.) Sixteen percent of respondents answered in multiple rounds, and fewer than one percent of respondents answered in all four survey rounds. Survey respondents generally answered all questions in the survey: most questions were answered by 96 percent or more of the respondents.

---

[67] We also surveyed a sample of other—that is, not attributed Medicare FFS—patients that CPC practices reported seeing in the prior year. We did not use their responses in this analysis of CPC-comparison differences because it would have been too burdensome to collect a list of such patients from the comparison practices. CMS shared responses from a sample of all patients with practices to support quality improvement and used the responses as part of shared savings calculations.

[68] We sought to obtain responses from 40 attributed Medicare FFS beneficiaries per CPC practice and 14 beneficiaries per matched set of comparison practices based on power calculations we did at the start of the evaluation. The targeted samples differ between the two groups because of the varying uses of the data for the evaluation. Respondent data from CPC practices were used to provide practice-level feedback, CMS's shared savings calculations, and to conduct the impact analysis reported here; respondent data from comparison practices were used only for the impact analysis. To achieve better power, we allocated more sample to the CPC practices to support practice-level estimates.

7.2.4. Analysis

Analytic comparisons. For each survey question measuring patient experience and five CAHPS composite measures created using a subset of the questions, we compared ratings between CPC and comparison practices in 2013 or the first year the question was asked, and again in 2016, to observe where patient experience differed between the two groups early in the initiative and near the end of the initiative. Because we were not able to collect data before CPC began, differences in any of the years may reflect preexisting differences between CPC and comparison practices. It is possible that CPC did not have an effect on patient experience during the first 8 to 12 months, the time of the first survey in 2013. However, in case it had, we did not calculate difference-in-differences estimates.

Our main analyses examine the proportion of respondents who answered each question with the *best* response. To test the sensitivity of these findings, we also conducted the same analyses using the *mean* response.

Regression analysis. We calculated the predicted probability of answering the best response and the mean responses using logistic and ordinary least squares (OLS) regressions, respectively, controlling for baseline beneficiary and practice characteristics and self-reported education level at the time of the survey. Because the rate of missing response was small—most questions had less than 4 percent data missing—we calculated findings among non-missing data and did not adjust for question nonresponse. For all regressions, we weighted estimates using beneficiary-level nonresponse weights (to make the sample similar to all attributed Medicare FFS beneficiaries) and practice-level matching weights (to ensure that CPC and comparison samples were similar). We clustered standard errors by practice for all respondents from CPC practices and by matched set for respondents from comparison practices to account for clustering of responses within a practice and respondents answering in more than one round.

Subgroup effects. We also looked at ratings of CPC and comparison practices by three key subgroups of beneficiaries:

- Whether the beneficiary is attributed to a practice that is part of a health care system (from 2016 data from SK&A, a healthcare vendor)
- The size of the beneficiary's practice (measured by the number of primary care clinicians in the practice)
- The beneficiary's relative health status (measured by whether the respondent's 2012 HCC score is above or below the median for all respondents across all survey rounds)

We used logistic and OLS regressions to test for subgroup effects. We first estimated a regression on each composite measure using the combined sample of beneficiaries from CPC and comparison practices, with a binary indicator for whether the beneficiary or the beneficiary's practice was in the subgroup of interest added to the other regression adjusters. We examined whether the coefficient on the subgroup indicator was statistically significant to determine whether there were different responses by subgroup. We also estimated regressions on each composite measure with three explanatory variables (in addition to the other regression adjusters): a binary indicator for treatment (CPC group) status, a binary indicator for whether the beneficiary or the beneficiary's practice is in the subgroup, and a term interacting treatment and subgroup status. We examined whether the coefficient on the treatment (CPC group)-subgroup interactor was statistically significant to determine whether CPC had a differential effect for members of the subgroup.

Power. Using two-tailed tests at the 10 percent significance level, the analysis had 80 percent power to detect small CPC-wide effects of one to three percentage points over time and between CPC and comparison practices for the composite measures and for most individual questions. Exceptions were for questions that applied to a small proportion of respondents, such as beneficiaries who had phoned the provider's office after hours or beneficiaries who had emailed the provider's office with medical questions, where we could detect differences of 6 to 11 percentage points.

Statistical and substantial importance. We considered responses between beneficiaries in CPC and comparison practices to be statistically different and of substantial importance if the difference met two criteria: (1) the *p*-value was less than 0.10 and (2) the difference between the two groups was larger than five percentage points.[69]

7.3. Results

Responses of Medicare FFS beneficiaries to the CPC patient survey suggest that while CPC practices were undergoing substantial changes to improve care delivery, beneficiaries' experiences with care at CPC practices were generally no different than experiences at comparison practices. Two exceptions indicate that CPC practices provided a higher proportion of beneficiaries with timely follow-up after hospital stays and after ED visits than comparison practices. These favorable effects are consistent with CPC's requirement for Milestone 6 (Care Coordination Across the Medical Neighborhood) to provide this type of follow-up care. Another difference suggests a possible unfavorable effect on beneficiaries always receiving an answer to their medical question as soon as needed when emailing their provider. However, very few beneficiaries reported emailing their provider with a medical question and had therefore answered this question.

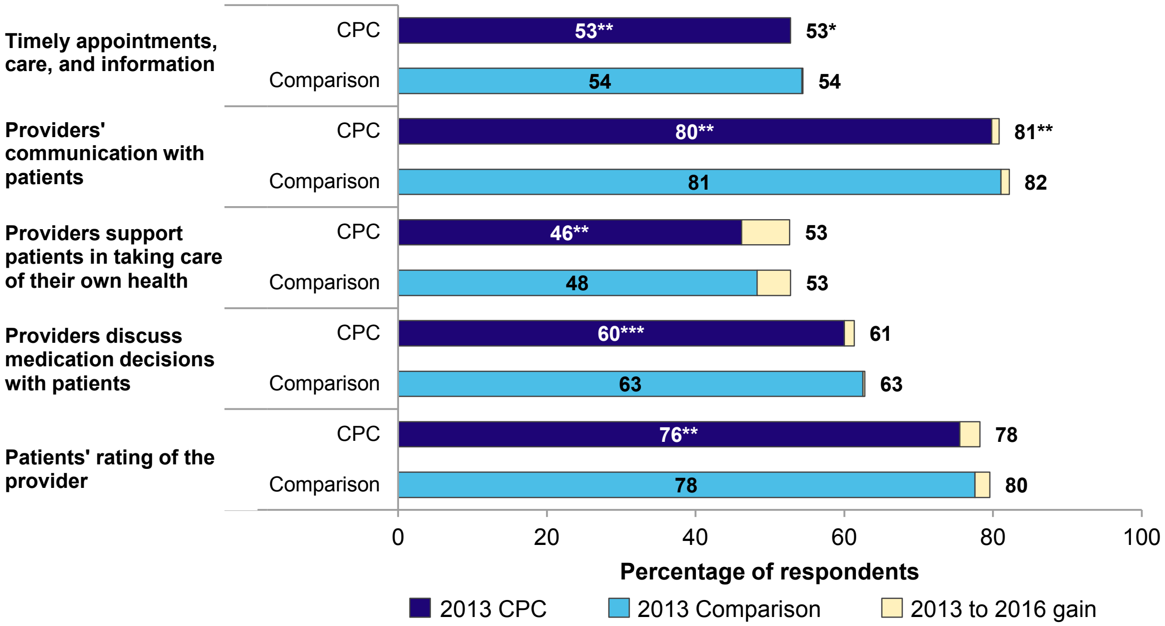
7.3.1. Composite measures

For both CPC and comparison practices, ratings across the composites varied in 2013, indicating some composites had more room for improvement. Figure 7.1 shows the percentage of beneficiaries giving the best ratings in 2013 (the first segment of each bar) and the change in ratings from 2013 to 2016 (the second segment of each bar) for each of the five composite measures, separately for CPC and comparison practices. In 2013, three composites had room for improvement: timely appointments, care, and information; providers support patients in taking care of their own health; and providers discuss medication decisions with patients, with between 46 and 63 percent of beneficiaries giving their practices the best ratings. Beneficiaries' ratings of the other two composite measures—providers' communication with patients, and patients' rating of the provider—were already fairly high in 2013, with more than 75 percent of the responding beneficiaries (CPC and comparison) providing the most favorable responses.

---

[69] We did not find any literature that defines what magnitude difference would be substantively important for CAHPS measures or other patient experience outcomes. In consultation with CAHPS experts, we decided to define a substantial difference as five percentage points.

Figure 7.1. Percentage of Medicare FFS beneficiaries giving the best response in 2013 and 2016, for five composite measures, CPC and comparison practices, CPC-wide



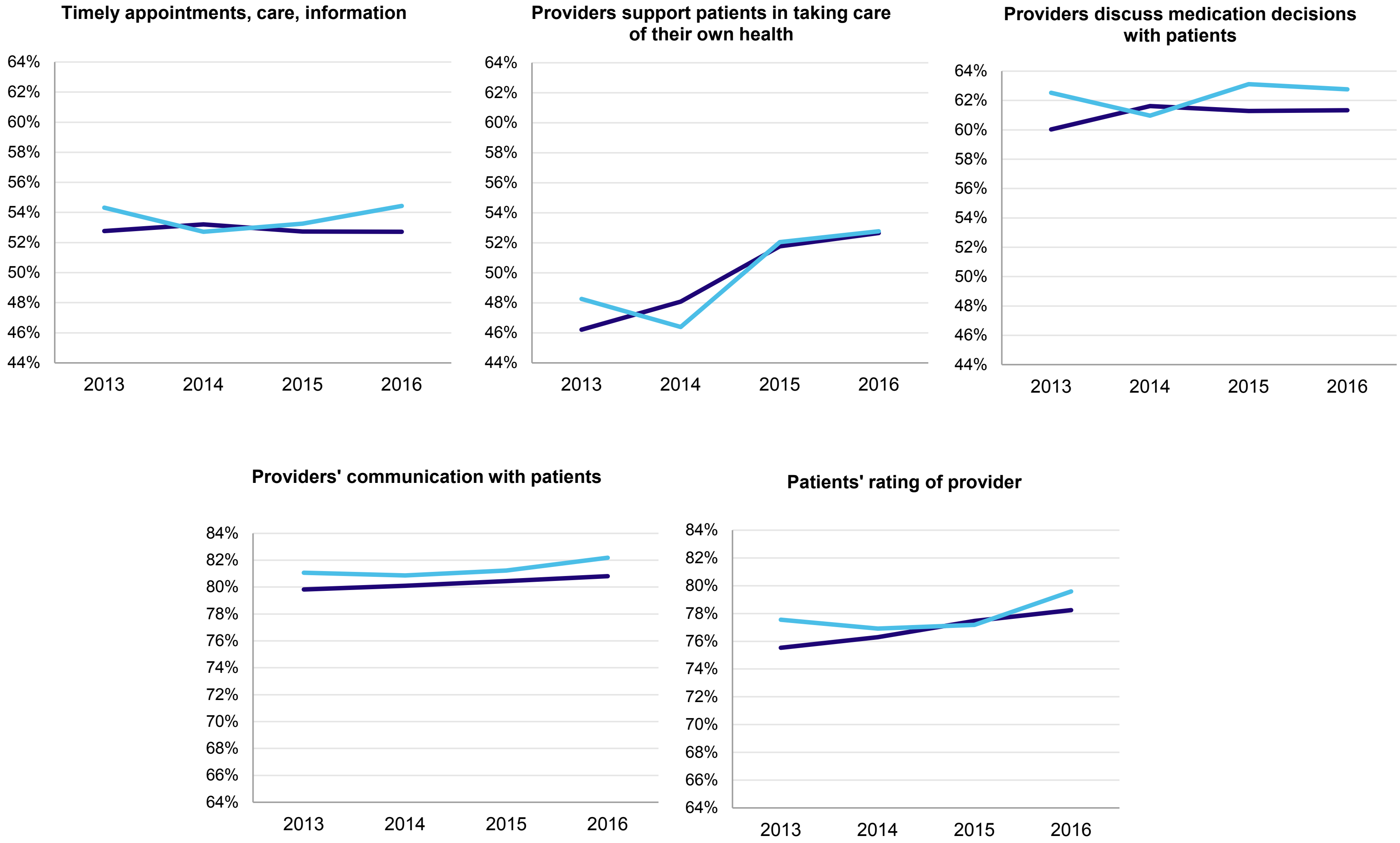
Sources: CPC patient surveys administered June through October 2013 and July through October 2016.

*/**/*** The percentage of beneficiaries giving the best response was statistically different between CPC and comparison practices in the given year at the 0.10/0.05/0.01 level, respectively, but of small magnitude.

FFS = fee-for-service.

Regardless of opportunities for improvement, improvements in beneficiaries' ratings between 2013 and 2016 were minimal (less than three percentage points) for four of the five composite measures. The first set of segments in Figure 7.1 indicates slightly higher ratings in comparison than in CPC practices in 2013. This difference favoring the comparison practices remains in 2016 for all but the providers support patients in taking care of their own health composite. Although some of the CPC-comparison differences were statistically significant, they were all under three percentage points, so not of substantive importance. The second segment in Figure 7.1 shows the changes over time for each composite measure; because changes were small, the second segment is barely visible for most composites. The exception was the composite measure for providers support patients in taking care of their own health that measures whether someone in the provider's office discussed with the beneficiary specific goals for his or her health and whether someone asked the beneficiary whether there are things in life that make it hard for the beneficiary to take care of his or her health. Between 2013 and 2016, both CPC and comparison practices experienced a statistically significant and meaningful improvement in beneficiaries' ratings of this composite. The percentage of beneficiaries giving the best response increased by 6 percentage points from 46 percent in 2013 to 53 percent in 2016 for CPC practices, but comparison practices experienced a similar improvement of 5 percentage points, from 48 to 53 percent. Figure 7.2 illustrates the dynamics over all four survey rounds for each composite measure for CPC and comparison practices.

Figure 7.2. Percentage of Medicare FFS beneficiaries answering with the best response, by composite measure, CPC and comparison practices, CPC-wide



Source: CPC patient surveys administered June through October 2013, July through October 2014, July through October 2015, and July through October 2016.
FFS = fee-for-service.

Overall, CPC did not improve beneficiary ratings for the five composite measures. Ratings for each composite were comparable for CPC and comparison practices in 2013. In 2016, near the end of the initiative, the ratings were still comparable for CPC and comparison practices (see Table 7.4, and Figures 7.1 and 7.2). Results for *mean* responses are similar to those for the proportion with the *best* response. Comparing 2016 mean responses suggests that beneficiaries' experiences at CPC and comparison practices were comparable for each composite measure (see Appendix F, Table F.8).

Table 7.4. Percentage of Medicare FFS beneficiaries giving the top-box response for five composite measures, CPC-wide, 2013 and 2016

	Beneficiaries in CPC practices (CPC-wide)			Beneficiaries in comparison practices (CPC-wide)			CPC-comparison differences (pp)	
Composite measure	2013	2016	2013 to 2016 (pp)	2013	2016	2013 to 2016 (pp)	2013	2016
Timely appointments, care, and information (five questions)	53	53	0	54	54	0	-2**	-2*
Provider communication (six questions)	80	81	1**	81	82	1	-1**	-1**
Providers support patients in taking care of their own health (two questions)	46	53	**6*** **	48	53	**5*** **	-2**	0
Providers discuss medication decisions with patients (three questions)	60	61	1**	63	63	0	-3***	-1
Patients' rating of the provider (one question)	76	78	3***	78	80	2*	-2**	-1

Notes: Green shading indicates that the estimate is both statistically ($p < 0.10$) and substantially (five or more percentage points) significant. Gray shading indicates that the estimate is statistically but not substantially significant due to a small magnitude.

*/**/*** The difference is statistically significant at the 0.10/0.05/0.01 level.

FFS = fee-for-service.

Variation in beneficiary ratings in 2016 by subgroup. We examined whether beneficiaries' ratings in 2016 differ by whether their practices are part of a health care system, the size of their practice, and their HCC score. There were no differential effects of CPC on any of these findings, meaning that the effect of being attributed to a practice in a system, belonging to a larger practice, or having a higher HCC score was similar for CPC and comparison practices (Appendix F, Tables F.7a–c).

Because the patterns in beneficiaries' ratings are largely the same for CPC and comparison practices, we examined whether beneficiaries' ratings differed by subgroup for CPC and comparison practices combined. For CPC and comparison practices, beneficiaries' ratings of the five composite measures were comparable between the subgroups for all but one of the 15 comparisons we examined. (We report the differences among the CPC and comparison practices combined in Table 7.5. Dashes in Table 7.5 indicate where beneficiary ratings did not differ meaningfully between the subgroups.) In 2016, beneficiaries were less likely to give the best ratings for timely appointments, care, and information for larger practices than for smaller practices. There were no meaningful differences in beneficiaries' ratings in any of the composite measures between practices in health care systems and practices not in systems or from beneficiaries with higher HCC scores compared with those with lower HCC scores (Table 7.5).

Table 7.5. Meaningful differences in Medicare FFS beneficiaries' ratings of practices by select practice and beneficiary characteristics, among CPC and comparison practices combined, 2016

Composite measure	Practices in a system compared with those not in a system	Larger practices compared with smaller practices	Patients with higher HCC scores compared with lower HCC scores
Timely appointments, care, and information[a]	–	Lower by 6 pp	–
Providers' communication with patients	–	–	–
Providers support patients in taking care of their own health[b]	–	–	–
Providers discuss medication decisions with patients[b]	–	–	–
Patients' overall ratings of the provider[a]	–	–	–

Note: – Indicates that beneficiary ratings were not meaningfully different between the subgroups. We defined an estimate as meaningfully different if it was both statistically ($p < 0.10$) and substantially (five percentage points or more) significant.

[a] Beneficiaries in practices that are in systems were statistically less likely than beneficiaries in practices not in systems to give the best responses for timely appointments, care, and information (3 percentage points, $p < 0.01$), and beneficiaries' overall ratings of the provider (2 percentage points, $p = 0.05$).

[b] Beneficiaries with higher HCC scores were statistically more likely than beneficiaries with lower scores to give the best responses for providers support patients in taking care of their own health (3 percentage points, $p < 0.01$), and providers discuss medication decisions with patients (2 percentage points, $p = 0.04$).

FFS = fee-for-service; pp = percentage point.

7.3.2. Individual questions not in the composite measures

In addition to the 17 questions used to calculate the five CAHPS version 2.0 composite measures, the survey contained 30 other questions about patients' experiences with care. These questions asked for beneficiaries' perspectives on various aspects of care delivery, including timely access to care and information, providers' communication with patients including use of web portals and reminders and follow-up about tests and treatment, providers' attention to patients' behavioral health needs, providers' coordination of care with specialists, provider follow-up after hospital stays and ED visits, patient engagement in caring for chronic conditions, comprehensiveness of care, and patients' overall ratings of care received from the provider. Table 7.6 shows the percentage of beneficiaries in CPC and comparison practices giving the most favorable ratings for these questions in 2013 or the earliest year the question was asked, and 2016.

CPC-comparison differences in 2013 or the first year the question was asked. In 2013 or the first year asked, ratings of CPC and comparison practices were not meaningfully different (to be meaningful, the difference must have been both statistically significant at the 0.10 level and five percentage points or more) for 26 of the 28 questions. The two questions exhibiting meaningful differences measure timely follow-up after hospital stays and after ED visits, requirements of Milestone 6 (Care Coordination Across the Medical Neighborhood):

- If the beneficiary stayed in a hospital overnight or longer in the last 12 months, the beneficiary saw a doctor, nurse practitioner, or physician assistant in the provider's office within two weeks after the most recent hospital stay (70 percent of beneficiaries in CPC practices in 2013 compared with 65 percent of beneficiaries in comparison practices)
- If the beneficiary visited the emergency room or emergency department for care in the last 12 months, the beneficiary was contacted by the provider's office within one week of most recent visit (53 percent of beneficiaries in CPC practices compared with 48 percent of beneficiaries in comparison practices in 2014, the first year this question was asked)

CPC-comparison differences in 2016. In general, near the end of the initiative in 2016, beneficiaries' ratings of CPC and comparison practices continued to be comparable across most areas of care delivery measured in this survey. Among the 28 questions that were asked in 2016, ratings of CPC and comparison practices were comparable for 25 questions.

Beneficiary ratings indicated better care from CPC than comparison practices for two questions. Similar to 2013 and 2014, the questions measure patient follow-up after hospital stays and after ED visits (Figure 7.3 and Table 7.6).

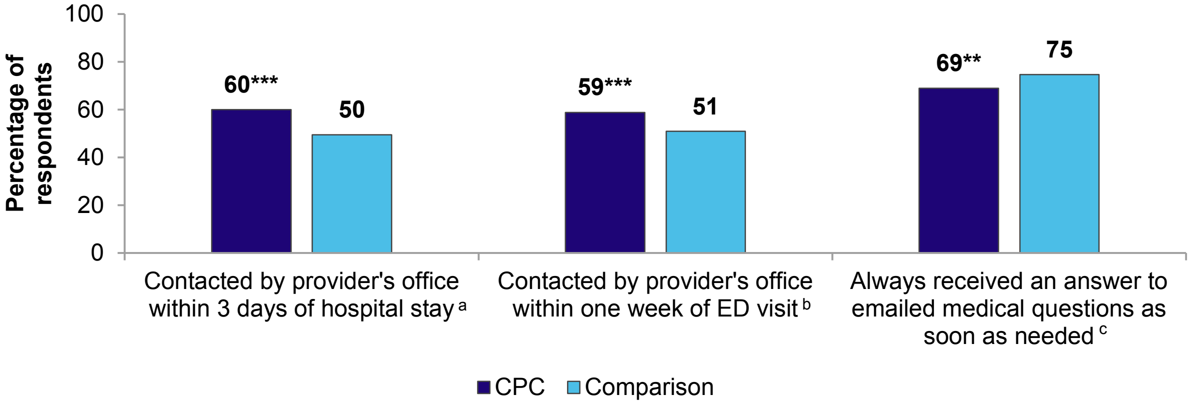
- If the beneficiary stayed in a hospital overnight or longer in the last 12 months, the beneficiary was contacted by the provider's office within three days of hospital discharge (60 percent of beneficiaries in CPC practices in 2016 versus 50 percent beneficiaries in comparison practices)[70]
- If the beneficiary visited the emergency room or emergency department for care in the last 12 months, the beneficiary was contacted by the provider's office within one week of his or her most recent visit (59 percent of beneficiaries in CPC practices in 2016 versus 51 percent of beneficiaries in comparison practices)

This finding suggests that the changes CPC practices reported making in these areas (described in Chapter 5) have positively affected beneficiaries' experiences with care.

---

[70] Starting with the 2014 survey, we used a revised version of the 2013 question that asked the patient whether he or she saw a doctor, nurse practitioner, or physician assistant in the provider's office within two weeks after their most recent hospital stay. The revised question shortened the follow-up time to be within three days of discharge. We made this change to align with the new reporting requirements for Milestone 6 beginning in PY2014 that required practices to follow up with 75 percent of patients from target hospitals within 72 hours of hospital discharge and did not specify where follow-up needed to occur.

Figure 7.3. Percentage of Medicare FFS beneficiaries giving the best response in 2016, CPC and comparison practices, CPC-wide



Sources: CPC patient surveys administered July through October 2016.

*/**/*** The percentage of beneficiaries giving the best response was statistically different between CPC and comparison practices in the given year at the 0.10/0.05/0.01 level, respectively, but of small magnitude.

[a] Among respondents that stayed in the hospital overnight or longer in the last 12 months.

[b] Among respondents that visited the emergency room or emergency department for care in the last 12 months.

[c] Among respondents that emailed their provider's office with a medical question in the last 12 months.

FFS = fee-for-service.

Beneficiaries' responses indicated marked improvement in providers' attention to patient's behavioral health needs. Between 2013 and 2016, the percentage of CPC beneficiaries reporting that someone in the provider's office asked them whether there was a period of time when they felt sad, empty, or depressed increased from 39 to 53 percent; and the percentage of beneficiaries reporting that someone from the provider's office spoke with them about things in life that worry them or cause them stress increased from 42 to 47 percent. However, comparison practices also experienced improvements in these two questions of 9 and 3 percentage points. Therefore, in 2016, as in 2013, the percentage of beneficiaries reporting the practice had done this was comparable between CPC and comparison practices.

Ratings of CPC practices were less favorable than those of comparison practices in 2016 for one question (Figure 7.3 and Table 7.6):

- Fewer beneficiaries in CPC practices reported that they always received an answer to their medical question as soon as needed when emailing their provider in the past 12 months (69 percent of beneficiaries in CPC practices compared to 75 percent of beneficiaries in comparison practices). However, fewer than 8 percent of beneficiaries in CPC and comparison practices reported emailing their provider and thus could answer the question in 2016 (data not shown).

Similarly, when looking at differences in *mean* responses to the 28 questions in 2016 that were not in the composites for CPC and comparison practices, we find that more beneficiaries reported follow-up after hospital stays (0.60 compared with 0.50 out of 1.0) and after ED visits (0.59 compared with 0.51) in CPC practices than comparison practices. Beneficiaries' ratings were comparable for the remaining 26 questions in 2016 (Appendix F, Table F.9).

Table 7.6. The proportion of Medicare FFS beneficiaries giving the best response to 28 survey questions not included in the composite measures, CPC and comparison practices, CPC-wide

	Percentage giving the best response					
	2013 (or earliest year asked)			2016		
	CPC	Comp	CPC–Comp	CPC	Comp	CPC–Comp
Timely access to care and information						
When patient phoned provider's office for care needed right away, patient usually got an appointment on same day	45	48	-3*	42	42	-1
Provider's office provided patient with information about what to do if care was needed during evenings, weekends, or holidays	78	79	-2*	79	79	0
If patient needed care during evenings, weekends, or holidays in the last 12 months, patient was always able to get needed care from provider's office	33	35	-3	32	31	0
When patient emailed provider's office, patient always received an answer to his/her medical question as soon as needed	67	68	-1	69	75	-6**
Providers' communication with patients						
If provider's office used a web portal or website, patient used it often (more than three times) to email the practice, review medical information, request prescription renewal, or make appointments *(first collected in 2014)*	13	14	-1	15	17	-2*
In the last 12 months, between visits, patient received reminders about tests, treatment, or appointments from provider's office	69	70	-1	71	71	0
If provider ordered a blood test, x-ray, or other test, provider's office always followed up to provide patient with test results	76	78	-2**	75	77	-2**
Patient always felt that provider really cared about patient as a person	77	79	-2**	79	81	-2**
Clerks and receptionists at provider's office were always as helpful as patient thought they should be	66	68	-2	71	74	-3***
Clerks and receptionists at provider's office always treated patient with courtesy and respect	82	84	-2***	86	86	0
Providers' attention to patients' behavioral health needs						
Practice staff asked patient during the last 12 months whether there was a period of time when the patient felt sad, empty, or depressed	39	40	-1	53*	49	3**
Provider spoke with patient during the last 12 months about things in life that worry the patient or cause the patient stress	42	43	-1	47	46	1
Practice staff spoke with patient during the last 12 months about a personal, family, mental, emotional, or substance abuse problem	30	30	0	31	30	1
Coordination of care with specialists and other providers						
If patient required a referral from provider to see a specialist, patient always easily got a referral	77	80	-2	75	75	0
If patient made an appointment to see a specialist, patient always easily got appointment with specialist	56	57	-1	54	54	0
If patient made an appointment to see a specialist, provider talked with patient during the last 12 months about the cost of seeing a specialist	8	9	0	8	7	1
If patient made an appointment to see a specialist, patient was worried or concerned during the last 12 months about the cost of seeing a specialist	22	22	-1	18	18	1
When patient saw a specialist, specialist always knew important information about patient's medical history	58	59	-2	57	59	-2**

Table 7.6. *(continued)*

	Percentage giving the best response					
	2013 (or earliest year asked)			2016		
	CPC	Comp	CPC–Comp	CPC	Comp	CPC–Comp
If patient visited a specialist, provider always seemed informed and up to date about the care patient received from specialist	59	61	-2*	60	63	-2**
If patient takes prescription medicines, someone from the provider's office spoke with the patient at each visit about all of the prescription medications patient was taking	87	87	0	87	87	0
If patient received conflicting or confusing advice from other providers, provider helped patient manage the information *(first collected in 2015)*	73	74	-2	74	74	0
Transitional care and provider follow-up after hospital stays and ED visits						
If patient stayed in a hospital overnight or longer in the last 12 months, patient saw doctor, nurse practitioner, or physician assistant in provider's office within two weeks after most recent hospital stay	70	65	5***	n.a.	n.a.	n.a.
When patient saw provider within two weeks of most recent hospital stay, provider seemed informed and up to date about patient's hospital stay	95	96	-1	n.a.	n.a.	n.a.
If patient stayed in a hospital overnight or longer in the last 12 months, patient was contacted by provider's office within three days of most recent hospital stay *(first collected in 2014)*	56	52	3*	60	50	11***
If patient visited the emergency room or emergency department for care in the last 12 months, patient was contacted by provider's office within one week of most recent visit *(first collected in 2014)*	53	48	5***	59	51	8***
Patient engagement in caring for chronic conditions						
If patient received care from provider for a chronic condition, patient was always asked for her/his ideas or goals when making a treatment plan *(first collected in 2014)*	37	36	1	36	36	-1
When patient received care from provider for a chronic condition, patient was always given a copy of her/his treatment plan *(first collected in 2014)*	46*	42	4**	47	46	1
Comprehensiveness of care						
Provider is always able to treat most of patient's health conditions and problems *(first collected in 2016)*	n.a.	n.a.	n.a.	51*	53	-2**
When patient visited provider with a new problem or symptom in the last 12 months, provider always immediately referred patient to a specialist instead of trying to treat the problem first *(first collected in 2016)*	n.a.	n.a.	n.a.	28	28	0
Patients' overall rating of care received from the provider						
Compared with one year ago, patient feels that the care received by the provider was much better *(first collected in 2014)*	18	17	1	17	17	0

Source: CPC patient surveys administered June through October 2013, July through October 2014, July through October 2015, and July through October 2016

Notes: */**/*** Responses were significantly different between CPC and comparison practices in the specified year at the 0.10/0.05/0.01 level, respectively.

Green and red shading indicates that the CPC-comparison difference is both statistically significant and substantially significant (five percentage points or larger). **Green shading** with **bold text** indicates that the difference is favorable to CPC; **red shading** with *italicized text* indicates that the difference is unfavorable to CPC.

FFS = fee-for-service; Comp = comparison practice; n.a. = not available because the question was asked in only the 2016 survey round.

Overall ratings of providers and care. Despite giving responses that indicate opportunities for improvement in many aspects of care, beneficiaries remained pleased with their providers. Roughly 80 percent of beneficiaries in both CPC and comparison practices rated their provider as a 9 or 10 out of 10 in 2016. In 2013, 76 percent of beneficiaries in CPC practices and 78 percent of beneficiaries in comparison practices gave this high rating. In 2014, the survey began asking beneficiaries to compare the care they received in the last 12 months with the care they received at the practice in the previous year. In each of the three years this question was asked, about 17 percent of beneficiaries in CPC and comparison practices reported that the care they received from the provider was much better than in the prior year; about two-thirds reported that the care compared with one year ago was about the same (data not shown).

7.4. Discussion

Medicare FFS beneficiaries' ratings of CPC and comparison practices were comparable across most areas of care measured in the patient survey over the four-year initiative. In 2013, 8 to 12 months into the initiative, beneficiaries in CPC and comparison practices gave similar ratings for each of the five summary composite measures (the four with adequate reliability and the one single-question composite). Beneficiaries' ratings ranged across the composites but indicated that both CPC and comparison practices had room for improvement in three composites: (1) timely appointments, care, and information; (2) providers support patients in taking care of their own health; and (3) providers discuss medication decisions with patients.

Between 2013 and 2016, the first and fourth years of CPC, beneficiaries' ratings of both CPC and comparison practices experienced minimal improvement (fewer than three percentage points) in all but one composite measure—providers support patients in taking care of their own health—where the percentage of beneficiaries giving the best response improved six percentage points for CPC practices, but a similar five percentage points for comparison practices. In 2016, beneficiaries' ratings of CPC and comparison practices were again comparable across all five composite measures, indicating that CPC did not improve patients' experiences as captured by these measures. In addition, there were no differential effects of CPC on beneficiaries who (1) were in practices in systems, (2) were in larger practices (measured by having more primary care clinicians), or (3) had higher risk scores. However, beneficiaries in both CPC and comparison practices were less likely to give favorable ratings of timely appointments, care, and information to larger practices.

Responses to 28 questions asked in 2016 that were not in the composite measures further support the finding that over the course of the four-year initiative, beneficiaries' experiences with care were generally comparable in CPC and comparison practices. There were no meaningful differences in beneficiaries' ratings for 25 of the 28 questions that were asked in 2016 and not included in the composite measures. The notable exceptions were that 10 and 8 percentage points, respectively, more beneficiaries in CPC practices than comparison practices reported receiving follow-up care after hospital stays and after ED visits. This finding is consistent with CPC practices' increasing deployment of follow-up care described in Chapter 5. There was one unfavorable difference. Fewer beneficiaries in CPC practices than comparison practices reported that they always received an answer to their medical question as soon as needed when emailing their provider (69 versus 75 percent). However, more than 92 percent of beneficiaries in both

CPC and comparison practices reported that they did not email their provider with a medical question in the past 12 months, and therefore did not answer this question.

These findings suggest that while CPC practices were undergoing substantial changes to improve care delivery, CPC beneficiaries' experiences with care changed little during the initiative and beneficiaries' ratings were no different from comparison practices on most aspects of care delivery. The areas where we did see consistent findings—the increasing percentages of beneficiaries who reported that their provider followed-up with them after hospital stays and ED visits—reflect CPC's emphasis on improved coordination of care across the medical neighborhood.

Prior studies found mixed effects of PCMH adoption on patient experience, measured using different patient survey instruments. The studies examined patient experience after a shorter exposure of their practices to transformation—one to two years after their respective interventions began. Four studies that looked at the impact of medical home transformation on patient experience of care found no statistically significant effects on patient experience one to two years after the intervention began (Jaén et al. 2010; Maeng et al. 2013; Heyworth et al. 2014; Reddy et al. 2015). Three other studies (two of which were on the same intervention) found statistically significant, favorable, but generally relatively small or isolated, effects in some dimensions of patient experience with care (Reid et al. 2009, 2010; Kern et al. 2013):

- Reid et al. (2009 and 2010) examined patient experience one and two years into a PCMH demonstration in one clinic compared with two comparison clinics. One year into the demonstration, patients in the demonstration clinic reported improved experiences relative to patients in the two comparison clinics in six of seven domains (p-values < 0.05): quality of doctor-patient interactions, shared decision making, coordination of care, access, patient activation and involvement, and goal setting and tailoring. Differences were small: between 2 and 3 points on a 100-point scale. Two years into implementation, effects moderated; relative to patients in the comparison clinics, patients in the demonstration clinic reported relatively larger improvements in patient experience in four of the seven domains, and effects were generally smaller.
- In another study of PCMH implementation that looked at how patient experience changed over time in a group of practices transforming into PCMHs, Kern et al. (2013) found statistically significant improvement at the 5-percent level in the proportion of respondents giving the best rating in the access-to-care composite measure (from 61 to 69 percent) and statistically significant improvement at the 10-percent level in experience with office staff (from 72 to 78 percent). The proportion of respondents giving the best rating in the composite measure for follow-up with test results showed a statistically significant decline at the 10-percent level, from 76 to 69 percent. There were no effects in the other dimensions of patient experience that they measured: communication and relationships, disease management, doctor communication, and overall rating of the doctor. However, the study did not have a comparison group to net out any secular trends that may have affected patient experience.

8. WHAT WERE CPC'S IMPACTS ON MEDICARE EXPENDITURES, SERVICE USE, AND QUALITY OF CARE DURING THE INITIATIVE?

CPC's changes to primary care delivery were expected to lower Medicare fee-for-service (FFS) expenditures and service use and improve quality of care. In this chapter, we describe the effects of CPC on claims-based health care expenditures, service use, and quality during the 51 months of the model (October 2012 through December 2016)[71] for Medicare FFS beneficiaries attributed to CPC versus those attributed to comparison practices. We estimated the impact of CPC by using difference-in-differences regressions that compare mean beneficiary outcomes between CPC practices and a set of similar practices that were not participating in CPC. The analysis compared outcomes from the 12 months before CPC and the 51 months after CPC began, and controlled for beneficiary, practice, and market characteristics. It included 565,674 unique Medicare FFS beneficiaries attributed at any time during the initiative to 497 CPC practices and 1,165,284 beneficiaries attributed to 908 matched comparison practices.[72] We used an intent-to-treat (ITT) approach that continued to include beneficiaries in the analysis even if they were no longer attributed. The chapter focuses on impacts for CPC as a whole; we report regional analyses in Appendix G. Appendix H provides additional details on the methods used to select the comparison group and Appendix I describes our analysis methods and provides definitions of the outcome measures.

8.1. Key takeaways on the effect of CPC on Medicare expenditures, service use, and quality of care

- **CPC had favorable effects on hospitalizations and emergency department (ED) visits.** Although Medicare service utilization grew during the initiative for both CPC and comparison practices, CPC practices experienced slower growth in hospitalizations, ED visits, and primary care visits than comparison practices. Hospitalizations increased by 2 percent less for CPC practices than for comparison practices over the initiative (or by 5 fewer hospitalizations per 1,000 beneficiaries per year, $p = 0.07$) (Table 8.1). There was also slower growth in outpatient ED visits for CPC practices than comparison practices during the initiative of 2 percent (or 10 fewer ED visits per 1,000 beneficiaries, $p = 0.03$). The effects on ED visits were more pronounced in the last two years of CPC.
- **The favorable effects on hospitalizations and ED visits are consistent with the findings from the implementation analysis.** For instance, deep-dive practices noted that promoting high-risk patients' access to a care manager improved care and reduced hospitalizations through more attentive transitional care, medication reconciliation, and the identification of

---

[71] In contrast to the program years we discuss in earlier chapters, Years 1 through 3 each contain one year of results, and Year 4 contains a year and a quarter of results. Year 1 results in this chapter are for CPC's first 12 months (October 2012 through September 2013), Year 2 results are for months 13 to 24 (October 2013 through September 2014), Year 3 results are for months 25 to 36 (October 2014 through September 2015), and Year 4 results are for months 37 to 51 (October 2015 through December 2016). However, we express all results in terms of per month or per year of follow-up; therefore, the length of the period over which outcomes are measured does not affect their means.

[72] Although 502 practices were selected to participate in CPC, 5 practices voluntarily withdrew after assessing the terms and conditions of CPC participation early in the initiative. Therefore, the evaluation includes 497 CPC practices in the ITT analysis of CPC's impacts.

problems between visits over the phone. Also, deep-dive practices noted that improvements they made in other areas were likely reducing ED use. Changes included:

- Better identifying patients who frequently used the ED and targeting outreach to them.
- Better identifying high-risk patients.
- Encouraging patients to call the office before using the ED for nonurgent care.
- Improving access to the primary care practice.

Findings from the beneficiary survey suggest that more CPC practices provided timely follow-up care after hospitalizations and ED visits than comparison practices. Practice members thought that providing better follow-up care after hospital discharges and ED visits improved patient care.

- **CPC reduced primary care visits.** Office-based primary care visits grew by 2 percent less for CPC than comparison practices (or by 68 fewer visits per 1,000 beneficiaries per year, $p = 0.07$) (Table 8.1). This effect on office-based primary care visits might have been driven by greater reliance on non-visit-based interactions with patients among CPC practices, for example, by phone, or through follow-up by care managers, who cannot bill Medicare for such services.
- **CPC did not lead to statistically significant changes in total Medicare expenditures (excluding care management fees).** Over the course of the initiative, Medicare expenditures without care management fees increased by 1 percent (or $9 per beneficiary per month [PBPM]) less for the CPC practices than the comparison practices, but the difference was not statistically significant ($p = 0.16$, 90 percent confidence interval [CI] -$19, $2) (Table 8.1). Lower growth in inpatient expenditures, expenditures on skilled nursing facilities, and outpatient services drove the lower growth in total expenditures for the CPC group.
- **Although we would expect the effects on patient outcomes to increase over time as practices further implemented the CPC functions, year-by-year effects on Medicare expenditures without fees *declined* over time.** Estimated savings declined from $18 in Year 1, to $11 in Year 2, $4 in Year 3, and $2 in Year 4 (Table 8.1).
- **CPC did not generate enough savings to offset the care management fees for Medicare FFS beneficiaries.** Including CPC's Medicare FFS care management fees (which averaged $15 per beneficiary in our ITT analysis),[73] average monthly Medicare expenditures per beneficiary increased by 1 percent or $6 more for CPC than for comparison practices over the 51 months. This difference was not significantly different from zero ($p = 0.35$, 90 percent CI -$4, $16). Findings from a Bayesian analysis also showed a high probability (94 percent) of some gross savings but almost a zero probability that the savings were sufficient

---

[73] CMS paid $20 PBPM in care management fees during Quarters 1 through 9 of CPC (through December 2014), and paid $15 PBPM from January 2015 onward (for the last eight quarters of CPC). Therefore, over the 17 quarters of CPC, the average PBPM care management fee paid for patients still attributed to a practice was approximately $18. However, the average PBPM fee received in our ITT analysis sample was $15, because we retain all beneficiaries in the analysis after they were first attributed, even if a practice withdrew or no longer received fees for them because they were no longer attributed.

to cover the care management fee. Therefore, it is unlikely that CPC was cost neutral or generated net savings for Medicare.

- **CPC had minimal effects on quality-of-care process and outcome measures.** There were very few sizeable or statistically significant estimates for the quality-of-care process and outcome measures, or continuity of care. Among the limited claims-based measures available (five process measures for beneficiaries with diabetes, and for all beneficiaries, one transitional care measure, four continuity-of-care measures, and three outcome measures), cumulative estimates show a statistically significant effect on only one measure: the likelihood of an ED revisit within 30 days of an outpatient ED visit increased by 0.2 percentage points less, or about 3 percent of the mean rate ($p = 0.02$), for CPC than comparison practices (Tables 8.3 and 8.10). In annual estimates, the only statistically significant findings for quality-of-care process measures among beneficiaries with diabetes were in the high-risk subgroup.[74]

- **Within certain subgroups, CPC generated a favorable impact on Medicare expenditures without care management fees, but the evidence for differential impacts for different types of practices was weak.** We expected that CPC might have different impacts for practices with certain characteristics, so we tested for differential impacts on subgroups defined by those characteristics. We found that estimated effects on Medicare expenditures without fees were favorable and significantly different from zero (indicating gross savings) for practices that:

  1. Were recognized as medical homes at baseline
  2. Had six or more clinicians or were affiliated with a larger organization
  3. Were hospital or system-owned
  4. Were medium-sized (3–5 clinicians)

  For example, the third finding indicates we found a favorable impact when we tested for differences among CPC and comparison practices that were owned by a hospital or system at baseline.

  In contrast, there were no statistically significant differences in Medicare expenditures between CPC and comparison practices among the subgroup that had at least one clinician who met requirements for meaningful use of electronic health records (EHRs), nor in its counterpart.

  The findings from these subgroup analyses suggest that practices with experience transforming care and greater access to resources may have achieved greater savings. However, there is only weak evidence for more favorable impacts within these practice subgroups because the impact estimates for any given subgroup were not significantly different from the estimates for its respective counterpart (that is, the opposite subgroup). For example, although there was a favorable $17 PBPM impact among practices that were

---

[74] This evaluation did not include the electronic clinical quality measures (eCQMs) that the model used for quality measurement and improvement for the entire practice population, and for calculating eligibility to share in any Medicare shared savings. Not all comparison practices report eCQMs, creating both conceptual and data challenges for analyzing the impacts of CPC on eCQMs.

owned by a hospital or system at baseline, that impact was not statistically different from the favorable $3 PBPM impact for practices that were not hospital- or system-owned at baseline. Applying any corrections for multiple comparisons or multiple hypothesis testing would make it even less likely that we would find statistically significant differences. We also tested different definitions of some subgroups. In total, we tested for differential impacts across the seven sets of subgroups shown in Table 8.8.

Table 8.1. Percentage impacts on Medicare FFS expenditures and service utilization over the four years of CPC (all attributed beneficiaries)

Outcomes	Year 1	Year 2	Year 3	Year 4	Years 1–4 combined
Total Medicare expenditures (dollars per beneficiary per month)					
Without CPC care management fees	-2%***	-1%	0%	0%	-1%
With CPC care management fees	0%	1%	1%	1%	1%
Expenditures by type of service (dollars per beneficiary per month)					
Inpatient	-3%**	-1%	0%	0%	-1%
Skilled nursing facility	-7%***	-6%**	-3%	-3%	-5%
Outpatient	-1%	-2%	-3%**	-3%*	-2%**
Physician	0%	-1%	1%	2%*	1%
Primary care physician	-2%***	-3%***	-1%	-1%	-2%*
Office-based primary care	-2%*	-3%***	-2%**	-1%	-2%**
Specialist	0%	1%	2%	3%**	2%*
Office-based specialist	1%	0%	1%	2%*	1%
Home health	-3%**	2%	1%	-1%	-1%
Hospice	2%	1%	10%*	7%	5%
DME	0%	-2%	-4%	-4%*	-3%
Service utilization (annualized rate per 1,000 beneficiaries)					
Hospitalizations	-2%*	-2%	-1%	-2%	-2%*
Total ED visits	-1%	-1%	-2%***	-2%***	-2%***
Outpatient ED visits	-1%	-1%	-3%***	-3%**	-2%**
Observation stays	2%	7%**	4%	7%**	5%**
Primary care visits	-1%	-1%*	-1%	-1%	-1%
Office-based primary care visits	-1%	-2%**	-2%*	-1%	-2%*
Specialist visits	0%	0%	1%	2%***	1%
Office-based specialist visits	0%	0%	0%	2%	0%

Source: Medicare claims data for October 2011 through December 2016.

Note: We base impact estimates on a difference-in-differences analysis; they reflect the difference in the regression-adjusted average outcomes for attributed Medicare FFS beneficiaries in CPC practices for a specific year compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in matched comparison practices. We calculate percentage impacts by dividing the impact estimate by the projected CPC group mean in the absence of CPC (that is, the unadjusted CPC group mean minus the CPC impact estimate). **Red shading** with *white italicized text* signifies that our estimate was statistically significant and showed an increase in the service use or expenditures outcome (note, however, that increases in expenditures or use of certain services such as primary care and hospice could be beneficial); **green shading** with **bold text** signifies that an estimate was statistically significant and implied a reduction in the service use or expenditures outcome. Expenditures on physician services include expenditures on primary care physician services, specialist services, and services provided by other noninstitutional providers (the third category is not shown separately). Measures of outpatient ED visits and total ED visits include observation stays. Primary care visits include both office-based primary care visits and primary care visits in other settings. Analysis includes 565,674 Medicare FFS beneficiaries attributed to 497 CPC practices and 1,165,284 beneficiaries attributed to 908 matched comparison practices. Each beneficiary can contribute as many as five observations in the analysis—one during the baseline year and one during each follow-up year.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

FFS = fee-for-service; DME = durable medical equipment; ED = emergency department; PBPM = per beneficiary per month.

8.2. Methods

Our difference-in-differences analysis compared changes in outcomes from the year before CPC began (baseline) to the period after it began for Medicare FFS beneficiaries attributed to CPC practices, with changes over the same period for beneficiaries attributed to comparison practices. We examined changes in outcomes from the year before CPC to the four years of CPC. We used an ITT analysis that included beneficiaries even if (1) they were no longer attributed to their original practice, or (2) their practice had closed, withdrawn from the initiative, merged with another practice, or split. Among beneficiaries attributed to a CPC practice in the first quarter of the initiative, 76 percent were still attributed to the same practice in Year 4.[75]

8.2.1. Comparison group selection

We used propensity-score matching to select seven comparison groups—one for each region's CPC practices. Practices in the pool from which we selected the comparison groups included (1) those in nearby areas (listed in Table 8.2) that were external to the CPC regions but that the authors and CMS considered to have reasonably similar demographics and market factors for "face validity" and enough practices for matching (external comparison practices), and (2) those that had applied to CPC in the same regions as the CPC practices but were not selected (internal comparison practices). Internal comparison practices met core eligibility criteria and were similar to CPC practices in terms of their use of EHRs but were not selected for CPC, primarily because they had low application scores.[76] They made up 28 percent of all selected comparison practices.

Table 8.2. CPC regions and external comparison group regions

CPC region	External comparison group regions
Arkansas	Tennessee
New York: Capital District-Hudson Valley region	Western and central New York, New Jersey, and Connecticut
Oregon	Idaho and Washington
Colorado	Utah, Kansas, and selected counties in New Mexico
New Jersey	Western and central New York and Connecticut
Ohio/Kentucky: Cincinnati-Dayton region	Remaining counties in Ohio
Oklahoma: Greater Tulsa region	Remaining counties in Oklahoma

---

[75] The corresponding figure for comparison practices was 72 percent. To focus on the continuity of attribution over time, these calculations excluded beneficiaries who died, moved out of state, or lost Medicare Part A or B eligibility.

[76] CMS selected practices to participate in CPC based largely on their application score. The score gave a practice as many as 530 points for using health information technology, as many as 80 points for the percentage of practice revenue from participating payers, as many as 70 points for patient-centered medical home recognition, and as many as 35 points for participating the prior three years in quality improvement or practice transformation activities (such as quality improvement organization activities, Regional Extension Centers, or local or national learning collaboratives). The score did not include pre-CPC expenditures, service use, or patient outcomes. Because EHR use was expected to affect outcomes, we required that CPC and comparison practices match exactly on whether they were meaningful users of EHRs. CMS also weighed other factors in its final selections, such as geographic and patient diversity.

We required both groups of practices to meet eligibility criteria similar to those for CPC practices.[77] Specifically, we required them to have at least 100 attributed Medicare beneficiaries[78] and at least one primary care clinician. Practices could not be participating in any Medicare shared savings model at baseline.

We selected comparison practices from this pool of potential comparison practices using a propensity-score model that matched CPC and comparison practices on various baseline practice characteristics from before CPC started in October 2012. These characteristics included:

- Status as a National Committee for Quality Assurance (NCQA)- or state-recognized medical home
- Number of clinicians
- Presence of a Medicare-defined meaningful user of an EHR
- Market characteristics, such as household income of the practice's zip code
- Average patient characteristics of the practice's attributed Medicare FFS beneficiaries, such as demographics and Medicare cost and service use before CPC

We then implemented a technique called *full matching* to form matched sets that contained one CPC practice and one or more comparison practices, or one comparison practice and multiple CPC practices. We identified a match for a given CPC practice when the propensity score for a potential comparison practice fell within a specified range around the CPC practice's propensity score, selecting as many as five matches. Thus, a practice could serve as a comparison for multiple CPC practices, and a CPC practice was typically matched to multiple comparison practices.

We included each group in the pool of potential comparison group practices for different reasons. We included *the internal comparison practices* because they had expressed the same willingness to participate in the initiative as the CPC practices and were therefore likely to share the same motivation and self-perceived capacity (unobserved characteristics) to provide enhanced primary care to beneficiaries. In addition, because these internal comparison practices were located in the same region as the CPC practices, they were subject to the same market conditions, such as practice patterns and health care markets. Therefore, including them helped account for market factors that could affect outcomes and that our control variables could not fully account for. Typically, evaluations do not choose nonselected practices for their comparison group out of concern that they were functioning more poorly than practices that had been selected, or could be contaminated due to spillover benefits of the model (about 14 percent of comparison practices shared the same owner as one or more CPC practices). However, CMS

---

[77] We did not apply some eligibility criteria (such as the requirement for at least 50 percent of a practice's revenue to come from participating payers) to comparison practices because CMS did not strictly apply the criteria. That is, we did not use eligibility criteria to exclude potential comparison practices if a nontrivial number of CPC practices did not meet the criteria (see Appendix H).

[78] Although the CPC eligibility criterion was 120 attributed beneficiaries, we used a threshold of 100 attributed Medicare beneficiaries for comparison practices, because our analysis of Medicare claims data found that some CPC practices actually had between 100 and 120 attributed Medicare beneficiaries.

did not score practices based on their pre-CPC outcomes or approaches to providing different aspects of primary care. (Also, our subsequent analysis showed that the application score was not related to Medicare expenditures or service use outcomes during the evaluation period.) Through propensity-score matching, we could ensure that the comparison group had similar values for two measures, perhaps related to subsequent performance, that CMS weighted heavily when scoring practices' applications: (1) meaningful use of EHRs and (2) medical home recognition. We also mitigated concerns about spillover effects in the internal comparison practices by running sensitivity analyses that included only beneficiaries from practices in the external group (located outside the CPC region).

We included in the comparison pool external comparison practices (from outside the CPC region) because they were not subject to selection bias resulting from not being selected during the application process, and they were unlikely to benefit from spillover of CPC. However, the comparison group did not contain only external practices, because we could not know which of them would have had the same motivation and self-perceived capacity (unobserved characteristics) to provide enhanced primary care to beneficiaries demonstrated by the practices that applied to CPC. Also, potentially unobserved differences in market factors between the CPC regions and the external comparison regions could affect outcomes. Nonetheless, it was necessary to include external comparison practices because there were too few CPC applicants that were not chosen for CPC to provide acceptable internal matches for all CPC practices.

To ensure that the selected comparison group was similar to CPC practices at baseline, we excluded from the potential comparison practices any practice that was participating in a CMS-sponsored shared savings model in 2012. (These practices were not eligible to participate in CPC.) During the initiative, about 42 percent of the selected comparison practices (ranging from 21 percent in Oklahoma to 60 percent in Ohio/Kentucky) joined a CMS-sponsored shared savings model; among comparison practices in CMS-sponsored initiatives, nearly 96 percent were in the Medicare Shared Savings Program (SSP), an accountable care organization (ACO). We do not believe this approach is a shortcoming. Rather, it ensures that the evaluation answers the question of how CPC alters outcomes compared with usual care, which also changed during this time. Thus, our impact estimates capture how Medicare FFS beneficiaries fared under CPC versus how they would have fared without CPC, given the availability of SSP and other initiatives. However, it is important to remember that CPC operated during a period with an unusually high number of large, federal and private initiatives to improve care and reduce costs. These initiatives may have had effects of their own, compared to what had been considered usual care. In other words, the evaluation assessed how CPC practices fared relative to practices that were operating in a changing landscape, which itself may have been influenced by CPC.

Appendix H shows that CPC and comparison practices were similar on a range of market-, practice-, and beneficiary-level characteristics. It also lists the number of comparison practices that we drew from the same region and from external regions.

We did not adjust significance levels to account for all the hypothesis tests we conducted, because we did not want to increase the likelihood of failing to identify a true intervention effect. Instead, because total Medicare expenditures was the most important measure and encompasses effects on all services and expenditures by type of service, we treated it as the primary outcome, for which we used a 0.10 significance level from a two-tailed test. Other outcomes were secondary. Therefore, we relied on a combination of the size, significance level, and patterns of findings across related measures, over time, and across regions, to assess whether statistically significant impact estimates were likely due to chance or to true effects of CPC.

8.2.2. Outcomes

We estimated impacts for the following claims-based outcomes to measure whether CPC reduced Medicare FFS expenditures and service use and improved quality of care:

- **Medicare Part A and Part B monthly expenditures (with and without Medicare's CPC care management fees).** We first examined whether CPC affected gross Medicare expenditures (not including fees) for service use and the size of those effects. We then examined whether the gross savings exceeded the care management fees. If impact estimates suggested that CPC reduced gross Medicare expenditures and net Medicare expenditures were not significantly different from zero, then we would have evidence that is consistent with (though not proof of) cost neutrality. If we could not reject the hypothesis of no effects on gross Medicare expenditures, then it would be unlikely that CPC was cost neutral, even if we could not reject the hypothesis that the effect on net expenditures was zero. This approach allowed us to gather rigorous evidence about whether CPC was cost neutral. Because CPC care management fees were a relatively small portion of Medicare expenditures, we might find that net Medicare expenditures were not significantly different from zero (due to limited statistical power) even if we had no clear evidence that CPC reduced expenditures for service use.
- **Medicare Part A and Part B monthly expenditures with Medicare's CPC care management fees and shared savings payments from CPC and SSP.** To provide a complete picture of savings or losses to Medicare, we also accounted for the fact that many CPC practices received shared savings payments from CMS as part of CPC in each performance year.[79] Further, a sizeable fraction of matched comparison practices, and some CPC practices that had stopped participating in CPC, were eligible to receive shared savings payments from Medicare based on their participation in other Medicare initiatives, especially SSP ACOs. Given that these payments were expenditures incurred by Medicare, we also estimated the impact on Medicare expenditures after accounting for Medicare shared savings payments received by both CPC and comparison practices from CPC and SSP. To do this, we constructed a PBPM measure of the shared savings payments received by CPC and comparison practices through their participation in CPC and SSP, using

---

[79] CMS's shared savings calculations served a different purpose than the evaluation. As such, they used a different approach (DeLia 2016; CMS 2017b) and generated different results. Shared savings are intended to provide practices with incentives to improve the quality and cost of care. For shared savings, CMS contractor Actuarial Research Corporation compared CPC-attributed beneficiaries' actual expenditures to an actuarial target spending level based on baseline spending of a reference population of other beneficiaries in the region, trended forward from 2012 to the performance year. In contrast, the evaluation was intended to assess the impact of CPC. The impact estimates described above compare the change in expenditures between the year before CPC began (October 2011 through September 2012) and the four years of CPC operations (October 2012 through December 2016) for beneficiaries attributed to CPC practices in the region relative to that of beneficiaries in matched comparison practices. Differences between the comparison strategies (and, to a lesser extent, the time periods) used to calculate shared savings and to conduct the evaluation produced some differences in results.

beneficiary attribution and Medicare FFS eligibility information. We calculated the total number of 'beneficiary-eligible' months in a given calendar year for a practice by aggregating across beneficiaries the number of months in which each beneficiary was attributed to the practice (or in the case of a practice in an ACO, the number of months in which each beneficiary was attributed to the ACO) and eligible for Medicare FFS. We then divided the annual shared savings payments to the practice from CPC or SSP by the practice's total number of beneficiary-eligible months in the year to obtain a PBPM amount. Finally, for each year of CPC, we added this PBPM shared savings amount to beneficiary-level monthly Medicare expenditures (including CPC care management fees) of beneficiaries in our analysis, for the months they were attributed to either a CPC practice or an ACO and were also enrolled in FFS Medicare.[80]

- **Medicare Part A and Part B monthly expenditures by type of service**. Types of service included inpatient, physician, outpatient, skilled nursing facility, durable medical equipment (DME), hospice, and home health.
- **Rates per 1,000 beneficiaries of annual Medicare service use**. Services included hospitalizations, outpatient ED visits, total ED visits, primary care physician visits in all settings, office-based primary care physician visits, specialist visits in all settings, and office-based specialist visits. Visits to primary care physicians and specialists included evaluation and management visits.[81]
- **Five annual claims-based quality-of-care *process* measures for beneficiaries with diabetes**.[82] For attributed beneficiaries with diabetes during a program year, we examined the likelihood of receiving:
    1. An HbA1c test.
    2. An eye exam.

---

[80] We obtained information on shared savings payments to CPC practices and to SSP ACOs during 2013 to 2015. Because of delays in the availability of shared savings information, we did not have payment information for calendar year 2016, which overlapped with Year 4 of CPC (October 2015 to December 2016).

[81] We identified primary care providers using Health Care Financing Administration (HCFA) specialty codes. Primary care visits in all settings included office-based primary care visits as well as visits in other settings with a primary care provider, such as primary care visits in the hospital or nursing home. Office-based primary care visits were visits with a primary care provider for office-based evaluation and management (CPT codes 99201–99205, 99211–99215). Specialist visits in all settings and office-based specialist visits were similarly defined, based on identifying specialists using HCFA specialty codes (see Appendix I for details, including lists of specialty codes for primary care and specialty providers).

[82] The initiative did not explicitly target these claims-based quality-of-care measures. Practices were required to report eCQMs based on their EHRs, but those quality measures include care received by beneficiaries from only that practice. The quality-of-care measures reported in this chapter span all of the care received by beneficiaries across all providers, not just the CPC practice. The three measures for patients with diabetes are based on Healthcare Effectiveness Data and Information Set (HEDIS) specifications. Note that earlier reports included two additional measures, for lipid testing among beneficiaries with diabetes and lipid testing among beneficiaries with ischemic vascular disease. We excluded these measures from the analysis for this final report, because the American College of Cardiology and the American Heart Association no longer recommend these tests.

   3. A urine protein test.
   4. All three exams or tests.
   5. None of the three exams or tests.

- **Four claims-based continuity-of-care measures for all beneficiaries**. To measure continuity of care, we examined:
   1. The percentage of primary care office visits with the attributed practice.
   2. The percentage of all (primary and specialist care) office visits with the attributed practice.
   3. The Bice-Boxerman Index (BBI) for primary care visits.[83]
   4. The BBI for all (primary and specialty care) office visits.
- **One claims-based transitional care measure**. To measure transitional care, we examined receipt of a follow-up visit by any clinician from the attributed practice or another practice within 14 days of a hospital discharge (included billing for complex chronic care coordination, chronic care management, and transitional care management; see Appendix I for details).
- **Three claims-based quality-of-care *outcome* measures**. For this category, we examined:
   1. The likelihood of an unplanned hospital readmission during the 30 days after hospital discharge.
   2. The rate of hospitalizations for ambulatory care sensitive conditions (ACSCs) per 1,000 beneficiaries per year.
   3. The likelihood of an ED revisit within 30 days of an outpatient ED visit.

In the next section, we discuss how we addressed issues of potential bias in readmission and re-visit measures due to possible effects of CPC on ED visits and hospitalizations.[84]

8.2.3. Difference-in-differences estimation strategy

We estimated the impact of CPC by using difference-in-differences regressions. These regressions compared mean outcomes between the CPC and comparison groups during the 4 quarters before CPC and the 17 quarters of CPC, while controlling for beneficiary, practice, and market characteristics. The outcomes were measured as Medicare expenditures PBPM, in annual rates per 1,000 beneficiaries for service use outcomes, and as percentage of beneficiaries receiving appropriate care for quality outcomes. The models netted out any remaining observable pre-existing differences in outcomes between the beneficiaries in CPC and comparison practices at baseline that propensity-score matching did not account for. Our estimated standard errors

---

[83] The BBI measures the concentration of a patient's visits across all practices that the patient visited over a period of time. For example, if a patient had 10 visits with the same practice, the BBI would be 1 (perfect continuity); if the patient had 1 visit with each of 10 practices, the BBI would be zero.

[84] This evaluation did not include the eCQMs used for quality improvement and for calculating shared savings. Not all comparison practices reported eCQMs, creating both conceptual and data challenges for analyzing the impacts of CPC on eCQMs.

accounted for practice-level clustering of beneficiary outcomes and for weighting. The observation weights were equal to the product of two separate weights that accounted for (1) the share of the year for which the beneficiary's data were observed, and (2) the matching (for beneficiaries in comparison practices only). We calculated the matching weights in a way that ensured that the total weights for beneficiaries in the comparison practices matched to a given CPC practice equaled the total weights for the beneficiaries in that CPC practice. That is, the set of comparison practices matched to a given CPC practice represented the same share of the overall comparison group as the CPC practice represented among all CPC practices.

For Medicare expenditures with and without care management fees and for the continuity-of-care measures, we estimated a linear regression. (We describe the measures and regressions in Appendix I.) For the service utilization outcomes (hospitalizations, ED visits, ACSC admissions, and physician visits), which were measured as utilization counts per 1,000 beneficiaries per year, we used maximum likelihood models appropriate for count variables. Specifically, to account for overdispersion in utilization counts, we used negative binomial models for service utilization outcomes such as physician visits, and to account for overdispersion and the large percentage of zeroes (beneficiaries with no utilization during a quarter), we used a zero-inflated negative binomial model for service utilization outcomes that had a large percentage of zeroes, such as hospitalizations and ED visits.[85] We used separate logistic regressions to estimate the likelihood of (1) an unplanned readmission within 30 days following a discharge, (2) a follow-up visit within 14 days of a discharge, and (3) an ED revisit within 30 days of an outpatient ED visit.[86] We also used logistic regressions for the binary quality-of-care measures for beneficiaries with diabetes included in the annual analysis.

Our regressions controlled for the same practice characteristics and market characteristics used in the propensity score matching. The practice characteristics were:

1. Status as an NCQA- or state-recognized medical home
2. Number of clinicians
3. Whether the practice is multispecialty
4. Whether the practice is owned by a larger organization
5. The presence of a Medicare-defined meaningful user of EHR

---

[85] The zero-inflated negative binomial model assumes that the excessive zeroes (1) were generated by a separate process from the count values and (2) can be independently modeled using a binary outcome model, such as a logit model.

[86] The equations for readmissions and follow-up visits were estimated on all discharges for beneficiaries with eligible index discharges, and included both beneficiary- and discharge-level control variables. The likelihood of an ED revisit was modeled for all beneficiaries and was estimated as a beneficiary-level outcome. To eliminate potential biases due to CPC effects on admissions, we separately estimated a beneficiary-level equation (that included all attributed beneficiaries) for whether the beneficiary had a readmission within 30 days of discharge. The beneficiary-level readmission rates were quite low (about 3 per 100 beneficiaries), and almost none of the results were statistically significant.

The market characteristics included:

1. Household income of the practice's zip code
2. Medicare Advantage penetration rate
3. Percentage of the county that is urban
4. Whether the practice is located in a medically underserved area

The regressions also controlled for beneficiary-level characteristics measured before CPC, including demographics (age categories, race categories, gender); Medicare and Medicaid eligibility (original reason for Medicare eligibility, dual status); and Hierarchical Condition Category (HCC) score. In addition, the readmission and follow-up visit equations included discharge-level controls to account for risk factors associated with each of a beneficiary's discharges. We sourced these control variables from the risk-adjustment methodology for CMS's Hospital-Wide All-Condition Unplanned Readmission measure, and they are statistically significant predictors of the risk of readmission and follow-up visits in our analysis. Specifically, we controlled for the following discharge-level factors: indicators for 31 condition categories (with one serving as the reference category) identified in inpatient episodes of care during the 12 months before the index admission, as well as those present at admission. To avoid endogeneity issues, we did not control for diagnoses that may have occurred as a complication of care during the index admission. We also controlled for indicators for the specialty cohort to which the principal diagnosis or procedure associated with the index discharge belonged. The six cohorts for which we included indicator variables in the model (with one serving as the reference category) were (1) medicine, (2) surgery, (3) cardiorespiratory, (4) cardiovascular, (5) neurology, and (6) other. For the ED revisit model, which was estimated at the beneficiary level, we also controlled for 23 baseline chronic condition indicators defined by applying the claims-based Chronic Conditions Warehouse algorithm to Medicare claims.

For all outcomes except continuity-of-care outcomes, we calculated effects for each of the four years of CPC separately. We also estimated effects cumulatively as weighted averages across the four years combined.[87] For continuity of care, we examined only cumulative outcomes over two periods—the four pre-intervention years combined and the four intervention years combined—to measure continuity over consistent and similarly broad time horizons both before and after the intervention. Because CPC had a total of 17 quarters, we annualized all Medicare expenditures and service use outcomes over 5 quarters in Year 4 of CPC instead of annualizing over 4 quarters, as in prior years. However, to ensure consistency in measure definitions over time for outcomes that were not annualized—for example, the binary quality-of-care process measures for beneficiaries with diabetes and for the continuity-of-care measures—we excluded Quarter 17. We report the size of the impacts (for example, in dollars for expenditures) and the percentage impacts. To calculate the percentage impacts, we divided the impact estimate by the projected CPC group mean in the absence of CPC (that is, the unadjusted CPC group mean minus the CPC impact estimate).

---

[87] We estimated quarterly results but we do not focus on them unless they show a meaningful trend, because they are more variable and less important than effects over a longer period. See Figure 8.3 for quarterly impact estimates for Medicare expenditures without fees.

We present results both for all attributed Medicare FFS beneficiaries and for a subgroup including the high-risk beneficiaries, for whom we expected CPC to have larger effects on expenditures and service utilization because of their greater need for costly services. This subgroup includes the beneficiaries with the highest quartile of 2012 HCC scores.

The following factors are important in interpreting findings from the impact analysis. First, because we followed the cohort of beneficiaries in each research group over time, we expected their expenditures and service use to increase as they age and their health deteriorates. Second, we refer to an impact estimate as a "relative reduction" if it suggests that the expenditures or service use of beneficiaries in CPC practices increased less than those of their comparison group counterparts; we refer to an impact estimate as a "relative increase" if it suggests that the expenditures or service use of beneficiaries in CPC practices increased more than those of their comparison group counterparts. Third, impact estimates for Years 1 through 3 in this report differ slightly from the estimates presented in prior reports. This variation occurs because the beneficiary-level impact estimates for prior years were updated using a longer period of claims runout and beneficiaries who were newly attributed to CPC or comparison practices were added to the baseline observation. The aggregate estimates also differ because we updated the total number of eligible beneficiary months during a year due to changes in eligibility information in the Medicare enrollment database.

8.2.4. Statistical power to detect effects

The numbers of practices and beneficiaries provided reasonable confidence that the analysis would detect even small impacts of CPC on Medicare service use and expenditures for all beneficiaries and for high-risk beneficiaries for the initiative as a whole, and would detect modest impacts by region. For estimates using two-tailed tests at the 10 percent significance level, the evaluation had 80 percent power to detect CPC-wide impacts of 2 percent on cumulative expenditure estimates during the course of the initiative and 2.4 percent on annual expenditure estimates. Minimum detectable effects (MDEs) for annual estimates range from about 4 to 8 percent for any region.

Although the MDEs were higher for the high-risk subgroup than for all beneficiaries (for example, about 3.5 percent versus 2.4 percent, respectively), it may be easier to detect effects among members of the high-risk subgroup. If intervention effects on expenditures, service use, and quality were concentrated largely among high-risk beneficiaries (for example, because there was less opportunity to reduce the need for expensive services by improving care for healthier beneficiaries), they may be more detectable than effects on all beneficiaries.

In interpreting the test results, we did not rely exclusively on p-values to draw inferences about whether an estimated effect was truly caused by the intervention. Furthermore, in many cases, it is likely that an estimated effect, when found to be statistically significant, was substantially larger than the unobserved "true" effect, on average, as noted by Gelman and Carlin (2014). Thus, in assessing whether a given impact estimate is evidence of a true effect of CPC, we drew on estimates of impacts on related outcomes, and the pattern of impact estimates across time and regions. In some cases, we provide context by using the Gelman and Carlin approach to calculate the expected degree to which a statistically significant estimate "exaggerates" the magnitude of the true impact. See Section 8.4 for a more detailed explanation and an illustration of such calculations.

8.2.5. Bayesian analysis

The Bayesian impact analysis followed the same approach as the frequentist analysis, but with several modifications that capitalized on advantages of the Bayesian paradigm. Where in the main analysis we fit difference-in-differences regression models separately in each CPC region, in the Bayesian analysis we fit a single difference-in-differences regression model that allowed impacts to vary by both region and year. We then averaged across the region-specific estimates to obtain CPC-wide estimates in each year.[88] As in the frequentist analysis, this regression controlled for baseline beneficiary and practice characteristics as well as a secular time trend. However, instead of adjusting standard errors for practice-level clustering using the sandwich estimator, we included random effects of beneficiary, practice, practice-year, region, and region-year to account for correlation among repeated observations along these dimensions.

The Bayesian analysis combined the difference-in-differences regression framework with assumptions about relationships among groups of entities; for example, the random effects described above were based on the assumption that repeated observations of the same entity, such as a beneficiary or practice, were related to each other. These assumptions strengthened the precision and plausibility of the impact estimates while allowing the data to dictate the strength of the relevant relationships. For example, our model posited that impacts were likely to be somewhat similar across regions and to evolve smoothly over time, enhancing precision by treating regions and consecutive time periods as mutually informative to the extent that the data supported the hypothesized similarity.

Unlike in a frequentist analysis, in a Bayesian analysis the object of inference is not only a point estimate but rather an entire probability distribution. From this distribution, we can derive probability statements describing the likelihood of impacts of different magnitudes, such as the chance that CPC reduced Medicare expenditures enough to offset the care management fees paid to participating practices.

8.3. CPC-wide results

Over the four years of the initiative, CPC did not lead to statistically significant changes in Medicare expenditures. However, CPC led to slower growth in hospitalizations, ED visits, and primary care visits during the initiative. The favorable effect on hospitalizations was similar in magnitude in all four years, but was statistically significant only in Year 1 and when four years of data were analyzed together. The favorable effects on ED visits were concentrated in the last two years of CPC. There were no statistically significant effects on quality-of-care process measures for beneficiaries with diabetes, or on continuity of care for all beneficiaries during the initiative. For claims-based quality-of-care outcomes, the only statistically significant effect was a relative reduction in the likelihood of an ED revisit within 30 days of an outpatient ED visit, with the effects concentrated in the last two years of CPC.

---

[88] We conducted a sensitivity test where we calculated CPC-wide estimates as a weighted average of region-specific values, weighting each region by its share of the total beneficiaries, as in the frequentist analysis. We obtained results that were essentially identical to those presented here, which weight each region equally.

8.3.1. Medicare expenditures

CPC did not have a statistically significant effect on Medicare expenditures without care management fees, and therefore was unlikely to have generated net savings for Medicare after taking care management fees into account. Findings from a Bayesian analysis also showed a high probability of some gross savings but almost a zero probability that the savings were sufficient to cover the care management fees. The results for Medicare expenditures were robust to most of the alternative model specifications that we ran, and effects were similar for high-risk beneficiaries. We found some evidence that impacts varied systematically by practice size, patient-centered medical home (PCMH) status and organizational affiliation, suggesting that practices with greater access to resources or more experience with care delivery transformation were more likely to reduce growth in expenditures.

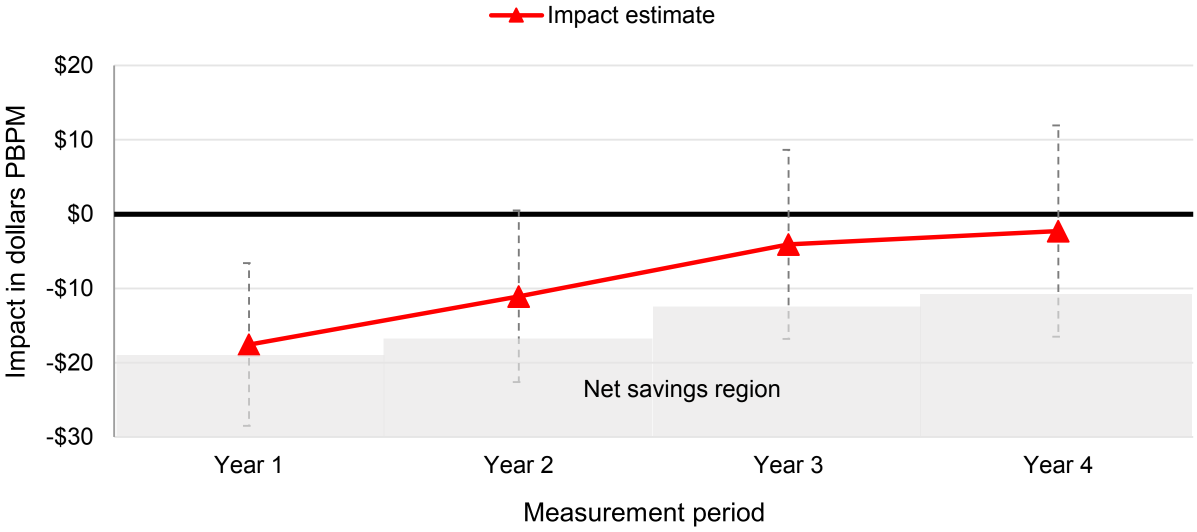
a. Total Medicare expenditures without care management fees

CPC had no statistically significant effect on Medicare FFS expenditures (excluding care management fees), and yearly estimates for total Medicare expenditures declined from Year 1 to Year 4.

Cumulative estimates. CPC had no statistically significant effect on Medicare FFS expenditures, not including Medicare's CPC care management fees, during the initiative. Table 8.3 summarizes the percentage impacts on Medicare expenditures and service use for all beneficiaries and high-risk beneficiaries. Across all seven regions combined and over the four years, total Medicare expenditures without care management fees increased for both CPC and comparison practices. However, they increased by $9 PBPM (or 1 percent) less for CPC practices than comparison practices—a favorable finding. This finding was not statistically significant ($p = 0.16$, 90 percent CI -$19, $2) (Table 8.3). The change in Medicare expenditures without fees was more favorable for beneficiaries in CPC practices than for the beneficiaries in comparison practices in all regions except Ohio/Kentucky. However, only the Oklahoma estimate of -$19, or 2 percent, was statistically significant. (See Table 8.5 and region-specific results in Appendix G, Tables G.1 through G.14.)

Annual estimates. The magnitude of yearly estimates for total Medicare expenditures declined from Year 1 to Year 4, although these estimates were not significantly different from one another. We did not expect CPC to have large effects during the first year of the initiative, because we expected practices would take time to transform and for transformation to in turn affect patient outcomes. Rather, we expected that effects would emerge gradually and either continue to grow or perhaps level off as practices deepened implementation of the care delivery changes. Contrary to expectations, the estimated reduction in the growth of expenditures without fees relative to the comparison practices was largest in Year 1. The estimates became smaller over time: -$18 PBPM, or 2 percent ($p < 0.01$) in Year 1, -$11 PBPM, or 1 percent ($p = 0.12$) in Year 2, -$4 PBPM, or less than 0.5 percent ($p = 0.60$) in Year 3, and -$2 PBPM ($p = 0.79$) in Year 4 (Figure 8.1 and Table 8.3). The estimate in Year 4 was significantly smaller than the estimate in Year 1, but the four annual estimates considered together were not significantly different from one another.

Figure 8.1. Estimated impact on Medicare FFS expenditures without care management fees, by year



Note: The estimated impact, denoted by a separate triangle for each CPC year in the figure, is equal to the difference in mean outcomes between attributed Medicare FFS beneficiaries in CPC and comparison group practices in any CPC year minus the average difference between the two groups during the baseline period. The impacts are regression-adjusted to control for pre-CPC differences in beneficiary and practice characteristics between the CPC and comparison groups. The dashed vertical line through each impact estimate shows the 90 percent confidence interval. The shaded region represents the net savings region, based on the average care management fees paid to the intent-to-treat sample. For CPC to achieve net savings in any year, the impact estimate needs to be inside the net savings region.

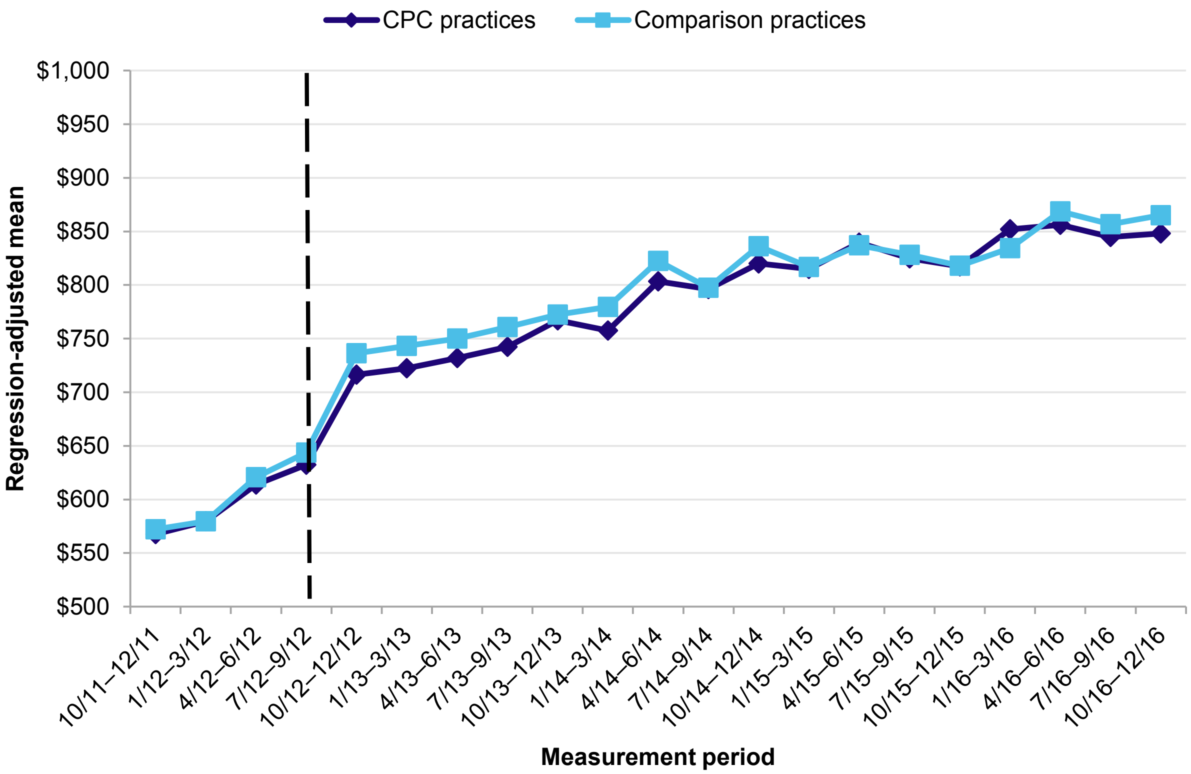
FFS = fee-for-service; PBPM = per beneficiary per month.

Regression-adjusted quarterly trends in Medicare expenditures for beneficiaries in CPC and comparison practices also show that favorable differences between the CPC and comparison groups that emerged during Quarters 1 through 7 largely disappeared during Quarters 8 through 14 of the initiative (Figure 8.2). This finding is also reflected in the pattern of the quarterly impact estimates, most of which were not statistically significant (Figure 8.3). Despite the greater variability in quarterly estimates, their general pattern conforms to the findings from the annual analysis. Because we cannot reject the hypothesis that the four annual estimates are equivalent, we focus most of our discussion in this chapter on cumulative impacts.

While the Year 1 estimate was sizable, it likely overstates CPC's true effect. Using the approach suggested by Gelman and Carlin (2014), we estimated the degree to which statistically significant estimates were expected to overstate the true effect on average ("Type M errors"), given the standard errors of the estimates. If the true effect for total Medicare expenditures in Year 1 was actually 1 percent ($9 PBPM) less growth for the CPC practices, consistent with the cumulative estimate over all four years, and the expectation was that first-year effects would likely be smaller than later effects, then a Year 1 estimate found to be statistically significant at the 0.10 level would be expected to "exaggerate" the true effect by a factor of about 1.8 (or by about $7 more PBPM). That difference is very close to the difference between the estimate for

Year 1 and the average estimate for the four years, providing support for the argument that the Year 1 estimate probably overestimates the true effect of CPC.

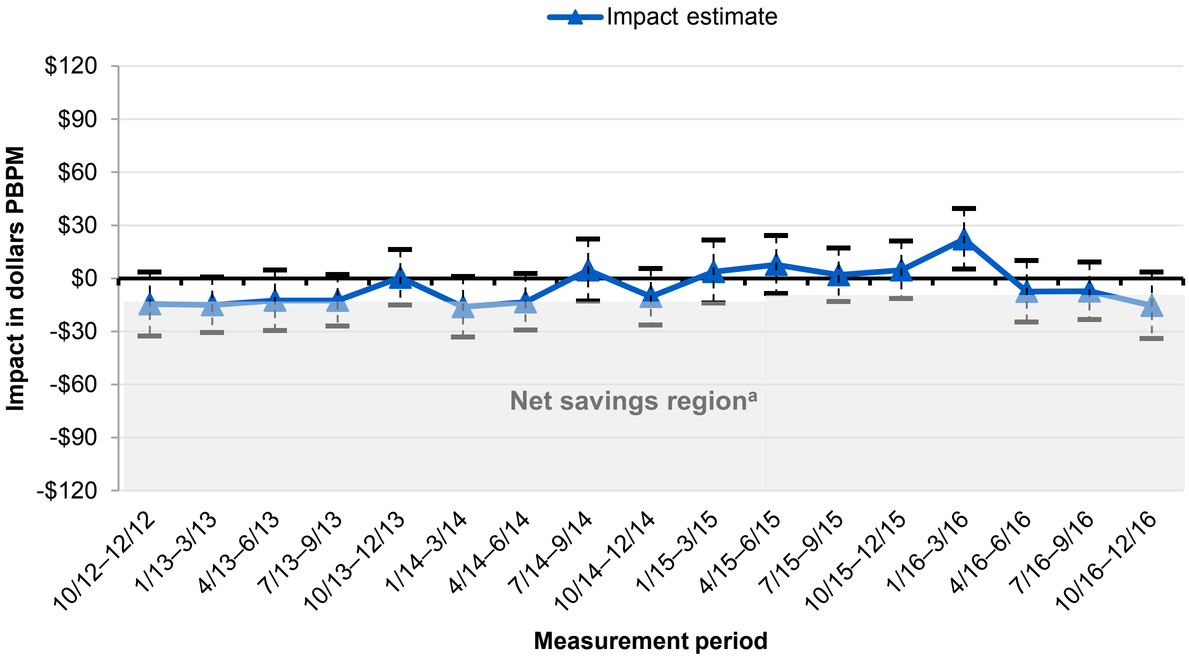
Figure 8.2. Regression-adjusted mean Medicare Part A and Part B expenditures PBPM, excluding Medicare's CPC care management fees, all beneficiaries, CPC-wide



Notes: The vertical dashed line indicates the start of the CPC initiative. Means are regression-adjusted to control for pre-CPC beneficiary characteristics (including HCC scores) and practice characteristics. The analysis includes only beneficiaries attributed during the CPC quarters who, by definition, must have been alive during the baseline period. Consequently, there was zero mortality and no occurrence of high end-of-life expenditures in the baseline period for beneficiaries in either CPC or comparison practices, so expenditures increased sharply after the initiative began.

HCC = Hierarchical Condition Category; PBPM = per beneficiary per month.

Figure 8.3. Estimated impact on Medicare Part A and Part B expenditures PBPM, excluding CPC care management fees, all beneficiaries, CPC-wide



Notes: The estimated impact, denoted by a separate triangle for each CPC quarter in the figure, is equal to the difference in mean outcomes between attributed Medicare FFS beneficiaries in CPC and comparison group practices in any CPC quarter minus the average difference between the two groups over the four pre-CPC quarters. The impacts are regression-adjusted to control for pre-CPC differences in beneficiary and practice characteristics between the CPC and comparison groups. The dashed vertical line through each impact estimate shows the 90 percent confidence interval.

[a] Impact estimates that fall in the shaded net savings region imply that there are savings after including the average CPC care management fees paid over the four years—that is, that estimated savings in expenditures without CPC care management fees exceed the CPC care management fees.

PBPM = per beneficiary per month.

Table 8.3. Regression-adjusted means and difference-in-differences estimates of CPC's impact on expenditure and utilization measures among attributed Medicare FFS beneficiaries, annual and four-year cumulative CPC-wide estimates

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Total Medicare expenditures (dollars PBPM)												
Without CPC care management fees												
Baseline	$525	$527	-	-	-	-	$1,268	$1,263	-	-	-	-
Year 1	$665	$684	-$18***	$7	-2%	0.009	$1,341	$1,369	-$34*	$19	-2%	0.073
Year 2	$731	$743	-$11	$7	-1%	0.115	$1,413	$1,411	-$3	$18	0%	0.853
Year 3	$802	$807	-$4	$8	0%	0.598	$1,511	$1,506	-$1	$21	0%	0.961
Year 4	$857	$860	-$2	$9	0%	0.791	$1,580	$1,563	$12	$21	1%	0.584
Years 1–4 combined	$821	$831	-$9	$6	-1%	0.162	$1,484	$1,486	-$8	$17	-1%	0.644
Test whether impacts for Years 1–4 are jointly significant	F = 2.419	*p*-value = 0.047					F = 1.756	*p*-value = 0.135				
With CPC care management fees												
Baseline	$525	$526	-	-	-	-	$1,269	$1,263	-	-	-	-
Year 1	$684	$684	$1	$7	0%	0.823	$1,369	$1,369	-$6	$19	0%	0.744
Year 2	$748	$743	$6	$7	1%	0.365	$1,441	$1,411	$25	$18	2%	0.169
Year 3	$814	$807	$9	$8	1%	0.248	$1,531	$1,506	$19	$21	1%	0.364
Year 4	$868	$860	$9	$9	1%	0.318	$1,597	$1,563	$28	$21	2%	0.190
Years 1–4 combined	$836	$831	$6	$6	1%	0.348	$1,507	$1,486	$16	$17	1%	0.353
Test whether impacts for Years 1–4 are jointly significant	F = 0.459	*p*-value = 0.766					F = 1.255	*p*-value = 0.286				
Expenditures by type of service (dollars PBPM)												
Inpatient												
Baseline	$180	$173	-	-	-	-	$486	$469	-	-	-	-
Year 1	$245	$249	-$10**	$4	-3%	0.016	$524	$531	-$25**	$11	-4%	0.028
Year 2	$265	$262	-$4	$4	-1%	0.424	$541	$525	-$1	$11	0%	0.941
Year 3	$285	$280	-$1	$4	0%	0.819	$571	$555	-$1	$12	0%	0.911
Year 4	$303	$298	-$1	$5	0%	0.749	$594	$572	$4	$12	1%	0.707
Years 1–4 combined	$296	$294	-$4	$4	-1%	0.266	$565	$554	-$6	$9	-1%	0.498

Table 8.3. *(continued)*

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Skilled nursing facility												
Baseline	$16	$18	-	-	-	-	$85	$90	-	-	-	-
Year 1	$40	$46	-$4***	$2	-7%	0.008	$118	$130	-$7	$5	-5%	0.194
Year 2	$50	$56	-$4**	$2	-6%	0.019	$132	$146	-$9*	$5	-6%	0.063
Year 3	$61	$65	-$2	$2	-3%	0.250	$153	$163	-$5	$6	-3%	0.355
Year 4	$66	$69	-$2	$2	-3%	0.360	$160	$168	-$3	$5	-2%	0.595
Years 1–4 combined	$65	$70	-$3*	$2	-5%	0.058	$148	$159	-$6	$4	-4%	0.18
Outpatient												
Baseline	$97	$102	-	-	-	-	$195	$201	-	-	-	-
Year 1	$109	$115	-$2	$1	-1%	0.249	$188	$196	-$2	$3	-1%	0.597
Year 2	$124	$131	-$3	$2	-2%	0.145	$209	$213	$2	$4	1%	0.592
Year 3	$136	$145	-$4**	$2	-3%	0.020	$221	$230	-$3	$4	-1%	0.527
Year 4	$147	$156	-$4*	$2	-3%	0.057	$237	$243	$1	$5	0%	0.869
Years 1–4 combined	$133	$142	-$3**	$1	-2%	0.020	$212	$219	-$1	$3	0%	0.863
Physician												
Baseline	$195	$190	-	-	-	-	$358	$345	-	-	-	-
Year 1	$212	$208	$0	$2	0%	0.918	$346	$335	-$1	$4	0%	0.742
Year 2	$223	$219	-$1	$2	-1%	0.483	$353	$341	-$1	$4	0%	0.759
Year 3	$238	$232	$2	$2	1%	0.409	$368	$353	$2	$4	1%	0.606
Year 4	$252	$242	$5*	$2	2%	0.052	$379	$358	$8	$5	2%	0.109
Years 1–4 combined	$240	$234	$1	$2	1%	0.432	$362	$347	$2	$3	0%	0.624
Primary care physician												
Baseline	$30	$31	-	-	-	-	$59	$59	-	-	-	-
Year 1	$36	$37	-$1***	$0	-2%	0.009	$62	$64	-$2***	$1	-3%	0.010
Year 2	$38	$40	-$1***	$0	-3%	0.008	$65	$66	-$1	$1	-2%	0.255
Year 3	$44	$45	$0	$1	-1%	0.534	$72	$73	-$1	$1	-2%	0.295
Year 4	$47	$48	-$1	$1	-1%	0.409	$76	$76	$0	$1	0%	0.83
Years 1–4 combined	$44	$45	-$1*	$0	-2%	0.081	$70	$71	-$1	$1	-2%	0.172
Office-based primary care physician												
Baseline	$18	$18	-	-	-	-	$29	$28	-	-	-	-
Year 1	$19	$19	$0*	$0	-2%	0.059	$27	$27	$0	$0	-1%	0.153
Year 2	$19	$19	-$1***	$0	-3%	0.005	$26	$26	-$1**	$0	-3%	0.016
Year 3	$19	$20	$0**	$0	-2%	0.032	$27	$27	-$1**	$0	-3%	0.019
Year 4	$20	$20	$0	$0	-1%	0.396	$27	$27	$0	$0	-2%	0.337
Years 1–4 combined	$19	$20	$0**	$0	-2%	0.036	$27	$27	-$1**	$0	-2%	0.038

Table 8.3. *(continued)*

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Specialist												
Baseline	$96	$92	-	-	-	-	$182	$172	-	-	-	-
Year 1	$105	$100	$0	$1	0%	0.763	$173	$164	-$1	$3	-1%	0.757
Year 2	$109	$104	$1	$1	1%	0.442	$173	$163	-$1	$3	-1%	0.683
Year 3	$114	$108	$2	$1	2%	0.179	$175	$161	$3	$3	2%	0.326
Year 4	$120	$112	$4**	$2	3%	0.012	$180	$163	$6*	$3	4%	0.054
Years 1–4 combined	$116	$110	$2*	$1	2%	0.096	$175	$163	$2	$2	1%	0.508
Office-based specialist												
Baseline	$21	$20	-	-	-	-	$37	$35	-	-	-	-
Year 1	$21	$20	$0	$0	1%	0.397	$34	$32	$0	$0	0%	0.883
Year 2	$22	$21	$0	$0	0%	0.784	$34	$32	$0	$0	0%	0.810
Year 3	$23	$22	$0	$0	1%	0.173	$34	$32	$0	$0	1%	0.531
Year 4	$23	$22	$0*	$0	2%	0.054	$33	$31	$0	$0	1%	0.374
Years 1–4 combined	$23	$22	$0	$0	1%	0.157	$33	$32	$0	$0	0%	0.620
Home health												
Baseline	$19	$23	-	-	-	-	$77	$86	-	-	-	-
Year 1	$26	$31	-$1**	$1	-3%	0.033	$77	$87	-$2	$2	-2%	0.316
Year 2	$32	$35	$1	$1	2%	0.288	$85	$91	$3*	$2	3%	0.100
Year 3	$38	$41	$0	$1	1%	0.693	$94	$102	$0	$2	0%	0.907
Year 4	$41	$46	$0	$1	-1%	0.614	$99	$109	-$1	$2	-1%	0.695
Years 1–4 combined	$41	$45	$0	$1	-1%	0.727	$93	$102	$0	$2	0%	0.947
Hospice[a]												
Baseline	-$4	-$3	-	-	-	-	$7	$11	-	-	-	-
Year 1	$11	$12	$0	$1	2%	0.743	$36	$39	$2	$2	4%	0.473
Year 2	$17	$18	$0	$1	1%	0.819	$49	$51	$2	$3	5%	0.418
Year 3	$22	$21	$2*	$1	10%	0.082	$58	$54	$7**	$3	14%	0.025
Year 4	$27	$27	$2	$1	7%	0.180	$66	$66	$4	$3	7%	0.202
Years 1–4 combined	$24	$24	$1	$1	5%	0.281	$56	$56	$4	$3	7%	0.127
DME												
Baseline	$22	$23	-	-	-	-	$60	$61	-	-	-	-
Year 1	$23	$23	$0	$0	0%	0.825	$51	$51	$1	$1	1%	0.502
Year 2	$20	$21	$0	$1	-2%	0.390	$44	$45	$0	$1	0%	0.999
Year 3	$22	$23	-$1	$1	-4%	0.103	$46	$49	-$2	$1	-4%	0.198
Year 4	$21	$22	-$1*	$1	-4%	0.093	$44	$47	-$2	$2	-3%	0.368
Years 1–4 combined	$22	$23	-$1	$0	-3%	0.148	$46	$48	-$1	$1	-1%	0.534

Table 8.3. *(continued)*

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Utilization (annualized rate per 1,000 beneficiaries)												
Hospitalizations												
Baseline	213	213	-	-	-	-	530	528	-	-	-	-
Year 1	261	267	-6*	3	-2%	0.059	564	575	-13	9	-2%	0.143
Year 2	265	271	-5	3	-2%	0.126	552	555	-4	9	-1%	0.652
Year 3	287	290	-3	3	-1%	0.383	592	599	-9	10	-1%	0.396
Year 4	294	300	-6	4	-2%	0.108	599	607	-10	11	-2%	0.339
Years 1–4 combined	300	306	-5*	3	-2%	0.067	591	598	-9	8	-2%	0.267
Total ED visits												
Baseline	518	531	-	-	-	-	1,140	1,156	-	-	-	-
Year 1	592	613	-8	5	-1%	0.141	1,183	1,214	-15	16	-1%	0.324
Year 2	636	657	-7	6	-1%	0.225	1,233	1,247	3	16	0%	0.872
Year 3	689	719	-17***	6	-2%	0.006	1,328	1,359	-15	19	-1%	0.427
Year 4	710	741	-18***	7	-2%	0.008	1,356	1,392	-19	20	-1%	0.352
Years 1–4 combined	702	730	-14***	5	-2%	0.008	1,291	1,319	-12	15	-1%	0.419
Outpatient ED visits												
Baseline	394	406	-	-	-	-	783	797	-	-	-	-
Year 1	423	438	-2	5	-1%	0.596	770	789	-5	12	-1%	0.685
Year 2	460	476	-4	5	-1%	0.426	821	831	4	13	0%	0.775
Year 3	490	516	-15***	5	-3%	0.007	870	894	-10	14	-1%	0.481
Year 4	503	528	-13**	6	-3%	0.021	887	916	-14	16	-2%	0.365
Years 1–4 combined	492	514	-10**	5	-2%	0.032	838	859	-7	11	-1%	0.565
Observation stays												
Baseline	39	40	-	-	-	-	88	89	-	-	-	-
Year 1	46	45	1	1	2%	0.352	92	91	3	4	3%	0.437
Year 2	57	54	4**	2	7%	0.013	110	102	9*	5	8%	0.066
Year 3	59	57	2	2	4%	0.165	112	108	5	5	4%	0.337
Year 4	63	60	4**	2	7%	0.019	119	113	7	5	6%	0.198
Years 1–4 combined	60	58	3**	1	5%	0.025	110	106	6	4	5%	0.146
Primary care visits												
Baseline	6,143	6,372	-	-	-	-	10,256	10,518	-	-	-	-
Year 1	6,706	7,021	-86	52	-1%	0.101	10,577	10,970	-131	109	-1%	0.230
Year 2	6,906	7,240	-105*	60	-1%	0.079	10,774	11,117	-80	132	-1%	0.544
Year 3	7,347	7,662	-86	72	-1%	0.231	11,470	11,925	-193	149	-2%	0.197
Year 4	7,650	7,945	-66	81	-1%	0.414	11,860	12,210	-88	162	-1%	0.587
Years 1–4 combined	7,551	7,884	-92	62	-1%	0.136	11,324	11,718	-130	122	-1%	0.287

Table 8.3. *(continued)*

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Office-based primary care visits												
Baseline	3,883	3,898	-	-	-	-	5,813	5,644	-	-	-	-
Year 1	4,002	4,053	-36	31	-1%	0.250	5,585	5,458	-43	50	-1%	0.391
Year 2	3,953	4,043	-75**	37	-2%	0.043	5,359	5,312	-122**	62	-2%	0.047
Year 3	4,030	4,132	-87*	45	-2%	0.050	5,370	5,361	-161**	78	-3%	0.039
Year 4	4,086	4,163	-61	52	-1%	0.235	5,344	5,293	-119	90	-2%	0.188
Years 1–4 combined	4,108	4,191	-68*	38	-2%	0.072	5,406	5,347	-110*	60	-2%	0.065
Specialist visits												
Baseline	11,351	11,372	-	-	-	-	20,707	20,472	-	-	-	-
Year 1	11,978	12,056	-57	70	0%	0.409	19,748	19,653	-140	158	-1%	0.375
Year 2	12,474	12,525	-31	76	0%	0.688	19,752	19,626	-109	156	-1%	0.485
Year 3	12,895	12,818	97	84	1%	0.250	19,997	19,643	119	173	1%	0.492
Year 4	13,228	13,022	225***	82	2%	0.006	20,035	19,398	402**	180	2%	0.025
Years 1–4 combined	13,270	13,221	69	68	1%	0.309	19,969	19,671	61	138	0%	0.655
Office-based specialist visits												
Baseline	4,014	3,950	-	-	-	-	6,926	6,734	-	-	-	-
Year 1	4,094	4,022	7	24	0%	0.757	6,353	6,155	5	45	0%	0.920
Year 2	4,192	4,139	-10	33	0%	0.752	6,224	6,081	-50	61	-1%	0.408
Year 3	4,232	4,158	10	42	0%	0.817	6,066	5,882	-9	71	0%	0.902
Year 4	4,280	4,152	63	42	2%	0.136	5,938	5,735	10	79	0%	0.900
Years 1–4 combined	4,336	4,250	20	32	0%	0.539	6,108	5,927	-10	53	0%	0.849
Total number of observations (CPC and comparison) across all years[b]	6,575,258						1,731,832					

Source: Medicare claims data for October 2011 through December 2016.

Note: Impact estimates are regression-adjusted for baseline beneficiary characteristics (including HCC scores) and baseline practice characteristics. We based each impact estimate on a difference-in-differences analysis, and it reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC practices in Years 1 to 4 compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in matched comparison practices. Expenditures on physician services include expenditures on primary care physician services, specialist services, and services provided by other noninstitutional providers (the third category is not shown separately). For Medicare service use measures, measures of outpatient ED visits and total ED visits include observation stays. Primary care visits include office-based primary care visits as well as visits in other settings, such as primary care visits in the hospital or nursing home. Regression-adjusted means for each year and for both groups from the annual regression are obtained by using average values of the control variables among beneficiaries in CPC practices in Year 4, in order to hold beneficiary and practice attributes fixed in generating predictions. Regression-adjusted means from the cumulative regression are obtained by using average values of the control variables among beneficiaries in CPC practices across all four CPC years. Regression-adjusted means from the cumulative regression are similar to but

Table 8.3. *(continued)*

not always perfectly aligned with those from the annual regression, due to differences in coefficients on control variables and the different samples used for predictions. However, the impact estimate from the cumulative regression is within the range of values for the impact estimates from the annual regression.

[a] Actual hospice expenditures at baseline were close to zero, because beneficiaries had to be alive and not in hospice during the look-back period for attribution (which ended five months before the start of CPC in two regions, and two months before the start of CPC in five regions). The negative baseline estimate is a result of predicting values using regression coefficients.

[b] Analysis includes 565,674 Medicare FFS beneficiaries attributed to 497 CPC practices and 1,165,284 beneficiaries attributed to 908 matched comparison practices. Each beneficiary can contribute as many as five observations in the analysis—one during the baseline year and one during each follow-up year.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

DME = durable medical equipment; ED = emergency department; FFS = fee-for-service; HCC = Hierarchical Condition Category; PBPM = per beneficiary per month.

b. Total Medicare expenditures by service category

Over the four years of CPC, expenditures for inpatient, skilled nursing facility, outpatient, and primary care clinician services increased slightly less for the CPC group than for the comparison group, although the estimate for inpatient expenditures was not statistically significant (Table 8.4).

- **Cumulative estimates.** The estimated $9 PBPM lower growth in total Medicare expenditures was modest and not statistically significant ($p = 0.16$). CPC practices had slightly smaller increases than comparison practices in PBPM expenditures for skilled nursing facilities ($3, or 5 percent, $p = 0.06$), outpatient services ($3, or 2 percent, $p = 0.02$), and inpatient expenditures ($4, or 1 percent, $p = 0.27$), but these estimates were partly offset by slightly larger increases in PBPM expenditures for specialist services ($2, or 2 percent, $p = 0.096$).
- **Annual estimates.** Savings in Medicare expenditures appeared to decline over time. The estimated effect for total Medicare expenditures without fees fell from -$18 PBPM in Year 1 to -$2 in Year 4. The components of this change include:
  - Ten dollar PBPM slower growth in expenditures on inpatient services for CPC than comparison practices ($p = 0.02$) accounted for more than half the $18 PBPM favorable effect on total Medicare expenditures in Year 1, but this effect on inpatient expenditures virtually disappeared by Year 4, when the estimate fell to -$1 PBPM ($p = 0.75$).[89]
  - The other contributor to the favorable Year 1 estimate for total Medicare expenditures was slower growth in CPC than comparison practices in skilled nursing facility expenditures (-$4 PBPM, $p = 0.01$), which also became less pronounced over time, and fell to -$2 PBPM ($p = 0.36$) in Year 4.
  - There were unfavorable changes between Year 1 and Year 4 in estimated effects on expenditures for specialist services. The estimated effect on expenditures for specialist services in all settings (including office-based settings as well as hospitals and nursing homes) increased from zero in Year 1 to $4 PBPM in Year 4 ($p = 0.01$).
  - Similarly, the estimate for effects on hospice expenditures increased from zero in Year 1 to $2 PBPM ($p = 0.18$) in Year 4. The greater increase in hospice expenditures among beneficiaries in CPC compared to comparison practices could be because beneficiaries in CPC practices started using hospice services earlier prior to death, which can potentially improve quality of life.[90]

---

[89] Unlike the declining expenditure estimates, the year-by-year impact estimates for the number of hospitalizations were relatively constant and remained slightly favorable (but not statistically significant) over time (see Table 8.5); this pattern suggests a shift toward fewer yet more expensive hospital stays among beneficiaries in CPC versus comparison practices.

[90] Only around 3 percent of beneficiaries in both CPC and comparison practices used hospice services or had any hospice expenditures in Years 3 and 4, and these percentages were similar across the two research groups. However, among those who used hospice services, expenditures during Years 3 and 4 increased (relative to baseline) by about $60 PBPM more among beneficiaries in CPC than comparison practices. This suggests an increase in the intensity or duration of hospice use in the CPC group relative to the comparison group in Years 3 and 4.

Table 8.4. Breakdown of savings in total Medicare FFS expenditures per beneficiary per month, by service category

	Year 1 impact estimate	Year 2 impact estimate	Year 3 impact estimate	Year 4 impact estimate	Combined Years 1, 2, 3, and 4 impact estimate
Total Medicare expenditures	-$18***	-$11	-$4	-$2	-$9
Inpatient	-$10**	-$4	-$1	-$1	-$4
Skilled nursing facility	-$4***	-$4**	-$2	-$2	-$3*
Outpatient	-$2	-$3	-$4**	-$4*	-$3**
Physician (primary care, specialist, and other noninstitutional providers)	$0	-$1	$2	$5*	$1
Primary care physician	-$1***	-$1***	$0	-$1	-$1*
Specialist	$0	$1	$2	$4**	$2*
Home health	-$1**	$1	$0	$0	$0
Hospice	$0	$0	$2*	$2	$1
Durable medical equipment	$0	$0	-$1	-$1*	-$1

Note: Expenditures on physician services include expenditures on primary care physician services, specialist services, and noninstitutional provider services (the third category is not shown separately).

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

FFS = fee-for-service.

c. Total Medicare expenditures with Medicare's CPC care management fees

CPC did not generate net savings during the four years and was unlikely to have been cost neutral. The impact estimate on Medicare expenditures with fees implied an increase of $6 PBPM ($p = 0.35$) more for CPC practices than comparison practices, because the $9 estimated relative reduction in monthly expenditures without fees over the 51 months (which was not statistically significant) offset just over half of the Medicare CPC care management fees (Table 8.3).[91] A test of whether net costs to CMS increased could not be rejected ($p = 0.84$), making it unlikely that the initiative generated net savings. However, the 90 percent confidence interval for the $6 impact estimate for Medicare expenditures with fees among all beneficiaries was -$4 to +$16. Thus, the net increase in costs due to CPC is likely to have been small.

---

[91] The average CPC care management fee received by practices was $15 per month per CPC beneficiary. This was less than the average of (1) the $20 average fee per month that CMS paid for attributed Medicare beneficiaries during Quarters 1 through 9 of CPC, and (2) the $15 average fee per month paid during Quarters 10 through 17, because our ITT sample follows beneficiaries even after they are no longer attributed to a CPC practice and no longer generating care management fees for the practice.

Over the four years of CPC, none of the regions achieved meaningful net savings in Medicare expenditures, although there is considerable uncertainty around the region-level estimates. Of the seven CPC regions, only Oklahoma had a statistically significant estimate that suggested slower growth in Medicare expenditures PBPM without fees for CPC than comparison practices (Table 8.5). The estimate, -\$19 (2 percent, $p = 0.06$) over the course of the initiative was enough to fully offset care management fees, yielding an estimated net savings of \$5 PBPM ($p = 0.65$). New York was the only other region with favorable cumulative estimates—without and with fees—of -\$25 and -\$10 PBPM (3 and 1 percent, $p = 0.13$ and $p = 0.56$), respectively, among all beneficiaries, and -\$52 and -\$28 PBPM (3 and 2 percent, $p = 0.15$ and $p = 0.43$), respectively, among high-risk beneficiaries; however, none of these findings were statistically significant. Ohio/Kentucky saw consistent, unfavorable estimated impacts on Medicare expenditures throughout the initiative, resulting in sizeable, statistically significant increases in net PBPM Medicare expenditures of \$39 (5 percent, $p = 0.03$) among all beneficiaries and \$119 (8 percent, $p < 0.01$) among high-risk beneficiaries. Over the four years of CPC, net savings did not exceed 1 percent in any region. In general, we have less confidence in the regional estimates, given much smaller sample sizes and greater variability than the pooled, CPC-wide estimates. Estimates from the Bayesian analysis presented in the following section shrink some of the differences across regions, but uncertainties about the estimates remain.

Table 8.5. Regression-adjusted means and difference-in-differences estimates of CPC's impact on Medicare FFS expenditures, hospitalizations, and outpatient ED visits, cumulative four-year estimates, by region

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Arkansas												
Without CPC care management fees												
Baseline	$562	$585	-	-	-	-	$1,279	$1,292	-	-	-	-
Years 1–4 combined	$781	$806	-$2	$13	0%	0.891	$1,403	$1,437	-$21	$40	-1%	0.604
With CPC care management fees												
Baseline	$562	$585	-	-	-	-	$1,279	$1,292	-	-	-	-
Years 1–4 combined	$796	$806	$12	$13	2%	0.353	$1,424	$1,437	$0	$40	0%	0.999
Hospitalizations												
Baseline	260	247	-	-	-	-	617	582	-	-	-	-
Years 1–4 combined	329	325	-8	6	-2%	0.195	641	639	-33*	18	-5%	0.070
Outpatient ED visits												
Baseline	471	463	-	-	-	-	919	883	-	-	-	-
Years 1–4 combined	562	550	4	13	1%	0.778	944	916	-8	35	-1%	0.824
Total number of observations (CPC and comparison) across all years	1,252,341						338,517					
Colorado												
Without CPC care management fees												
Baseline	$536	$549	-	-	-	-	$1,294	$1,342	-	-	-	-
Years 1–4 combined	$731	$753	-$9	$20	-1%	0.658	$1,358	$1,410	-$3	$73	0%	0.966
With CPC care management fees												
Baseline	$536	$549	-	-	-	-	$1,294	$1,343	-	-	-	-
Years 1–4 combined	$746	$753	$6	$20	1%	0.757	$1,384	$1,411	$22	$73	2%	0.758
Hospitalizations												
Baseline	189	213	-	-	-	-	481	542	-	-	-	-
Years 1–4 combined	237	262	-1	9	0%	0.929	488	538	10	32	2%	0.759
Outpatient ED visits												
Baseline	369	384	-	-	-	-	758	785	-	-	-	-
Years 1–4 combined	460	477	-1	11	0%	0.899	846	838	35	33	4%	0.297

Table 8.5 *(continued)*

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Total number of observations (CPC and comparison) across all years	992,008						228,822					
New Jersey												
Without CPC care management fees												
Baseline	$653	$663	-	-	-	-	$1,394	$1,416	-	-	-	-
Years 1–4 combined	$953	$972	-$9	$15	-1%	0.533	$1,689	$1,726	-$15	$28	-1%	0.587
With CPC care management fees												
Baseline	$653	$662	-	-	-	-	$1,394	$1,416	-	-	-	-
Years 1–4 combined	$968	$972	$5	$15	1%	0.741	$1,712	$1,726	$8	$28	0%	0.768
Hospitalizations												
Baseline	208	213	-	-	-	-	477	486	-	-	-	-
Years 1–4 combined	291	299	-2	7	-1%	0.726	567	582	-7	15	-1%	0.651
Outpatient ED visits												
Baseline	302	321	-	-	-	-	544	560	-	-	-	-
Years 1–4 combined	349	367	0	8	0%	0.951	579	601	-7	15	-1%	0.662
Total number of observations (CPC and comparison) across all years	778,293						215,730					
New York												
Without CPC care management fees												
Baseline	$593	$598	-	-	-	-	$1,253	$1,234	-	-	-	-
Years 1–4 combined	$854	$883	-$25	$17	-3%	0.134	$1,487	$1,520	-$52	$36	-3%	0.151
With CPC care management fees												
Baseline	$593	$597	-	-	-	-	$1,253	$1,234	-	-	-	-
Years 1–4 combined	$869	$883	-$10	$17	-1%	0.561	$1,510	$1,520	-$28	$36	-2%	0.434
Hospitalizations												
Baseline	230	211	-	-	-	-	525	476	-	-	-	-
Years 1–4 combined	311	307	-15***	6	-5%	0.005	599	585	-35**	16	-6%	0.026
Outpatient ED visits												
Baseline	378	373	-	-	-	-	677	662	-	-	-	-
Years 1–4 combined	447	450	-8	8	-2%	0.314	740	707	18	25	2%	0.462

Table 8.5 *(continued)*

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Total number of observations (CPC and comparison) across all years	638,176						181,345					
Ohio/Kentucky												
Without CPC care management fees												
Baseline	$580	$613	-	-	-	-	$1,272	$1,303	-	-	-	-
Years 1–4 combined	$868	$878	$23	$17	3%	0.181	$1,580	$1,517	$94***	$33	6%	0.005
With CPC care management fees												
Baseline	$580	$613	-	-	-	-	$1,272	$1,303	-	-	-	-
Years 1–4 combined	$883	$878	$39**	$17	5%	0.026	$1,605	$1,517	$119***	$33	8%	<.001
Hospitalizations												
Baseline	259	278	-	-	-	-	597	623	-	-	-	-
Years 1–4 combined	342	352	9	10	3%	0.381	669	665	30	19	5%	0.128
Outpatient ED visits												
Baseline	442	444	-	-	-	-	799	774	-	-	-	-
Years 1–4 combined	525	544	-18*	11	-3%	0.086	876	875	-24	23	-3%	0.296
Total number of observations (CPC and comparison) across all years	840,655						231,891					
Oklahoma												
Without CPC care management fees												
Baseline	$585	$583	-	-	-	-	$1,333	$1,330	-	-	-	-
Years 1–4 combined	$831	$849	-$19*	$10	-2%	0.057	$1,498	$1,540	-$44	$30	-3%	0.145
With CPC care management fees												
Baseline	$585	$584	-	-	-	-	$1,333	$1,331	-	-	-	-
Years 1–4 combined	$846	$849	-$5	$10	-1%	0.646	$1,520	$1,540	-$22	$30	-1%	0.458
Hospitalizations												
Baseline	264	258	-	-	-	-	621	616	-	-	-	-
Years 1–4 combined	338	335	-3	6	-1%	0.558	655	654	-3	19	0%	0.875
Outpatient ED visits												
Baseline	459	490	-	-	-	-	881	958	-	-	-	-
Years 1–4 combined	551	601	-19	12	-3%	0.110	920	1,052	-55*	31	-6%	0.076

Table 8.5 *(continued)*

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Total number of observations (CPC and comparison) across all years	958,272						252,320					
Oregon												
Without CPC care management fees												
Baseline	$551	$539	-	-	-	-	$1,217	$1,195	-	-	-	-
Years 1–4 combined	$756	$755	-$11	$10	-1%	0.271	$1,372	$1,340	$10	$32	1%	0.755
With CPC care management fees												
Baseline	$551	$539	-	-	-	-	$1,218	$1,196	-	-	-	-
Years 1–4 combined	$771	$755	$4	$10	1%	0.675	$1,396	$1,340	$34	$32	2%	0.297
Hospitalizations												
Baseline	202	193	-	-	-	-	474	452	-	-	-	-
Years 1–4 combined	253	252	-9	6	-3%	0.137	505	492	-8	19	-2%	0.654
Outpatient ED visits												
Baseline	444	433	-	-	-	-	883	858	-	-	-	-
Years 1–4 combined	526	541	-27*	15	-5%	0.078	936	920	-9	41	-1%	0.835
Total number of observations (CPC and comparison) across all years	1,115,513						283,207					

Source: Medicare claims data for October 2011 through December 2016.

Note: Impact estimates are regression-adjusted for baseline beneficiary characteristics (including HCC scores) and baseline practice characteristics. Each impact estimate is based on a difference-in-differences analysis and reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC practices in all four years combined, compared with baseline, relative to the same difference over time for attributed Medicare FFS beneficiaries in matched comparison practices. The number of observations includes the total number of CPC and comparison group observations across all years.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

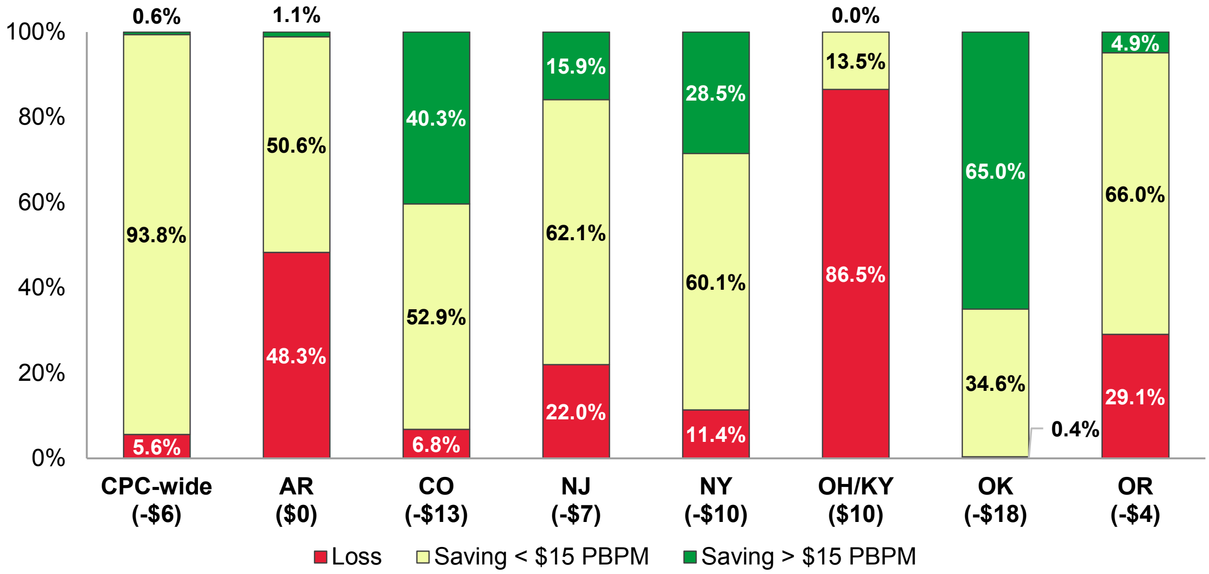
ED = emergency department; FFS = fee-for-service; HCC = Hierarchical Condition Category; PBPM = per beneficiary per month.

d. Bayesian analysis for total Medicare expenditures

Results from a Bayesian analysis likewise suggest that intervention effects were not large enough to generate net savings across CPC. Based on this analysis, there is a 94 percent probability that CPC generated some savings across all regions and years. However, the probability that impacts across all CPC regions combined over the course of the initiative exceeded the $15 threshold to recoup the fees paid by Medicare and achieve net savings is almost zero—approximately 0.6 percent.

Figure 8.4 shows, overall and by region, the probabilities that CPC (1) achieved net savings (green), (2) achieved net losses (red), or (3) reduced expenditures less than the amount needed over the initiative's 51 months to reach cost neutrality (yellow). The probabilities of net savings over the 51 months are computed as the average across the four intervention years. As with the frequentist estimates, we have more confidence in the CPC-wide results. Among the regions, only Ohio/Kentucky is highly likely to have had greater increases in expenditures before care management fees in CPC than comparison practices. Based on the frequentist results, New York generated the largest estimated reduction in expenditures before fees (although the estimated savings were not statistically significant), followed by Oklahoma; however, the Bayesian analysis shows that Oklahoma and Colorado were the most likely to have had savings that exceeded care management fees, followed by New York. The estimates suggest that there was a 65 percent probability that Oklahoma achieved net savings (gross savings exceeding the average care management fee) during the four years of CPC.

Figure 8.4. Probability that CPC achieved savings (before fees) during initiative



Note: PBPM impact estimates from the Bayesian analysis are in parentheses.

The Bayesian results show a much higher probability of net savings during Year 1 than in later years in most regions, which is consistent with our difference-in-differences estimates (Table 8.6). When we include additional follow-up from Years 2 through 4, the analysis shows that these early findings were not sustained, and the probability that CPC generated savings declined, dramatically for some regions. Similar to the frequentist findings, the CPC-wide Bayesian findings suggest that CPC practices had less growth in Medicare expenditures than comparison practices over the four years, but not enough to cover Medicare's care management fees.

Table 8.6. Probability that CPC achieved savings, by year, based on a Bayesian analysis

	CPC-wide	AR	CO	NJ	NY	OH/KY	OK	OR
Probability of decrease in Medicare expenditures without care management fees								
Year 1	>99.9	77.8	76.8	99.9	87.5	36.0	>99.9	96.2
Year 2	99.2	52.9	91.4	92.4	91.5	28.1	99.4	90.0
Year 3	68.0	39.1	95.8	26.5	87.2	15.2	86.4	43.5
Year 4	16.4	28.6	92.3	7.4	65.7	2.9	46.9	9.5
Years 1-4 combined	94.4	51.7	93.2	78.0	88.6	13.5	99.6	70.9
Probability of recovering Medicare's CPC care management fees								
Year 1	30.3	9.3	12.3	90.0	31.8	1.5	99.0	42.8
Year 2	0.5	0.7	24.5	29.5	26.6	0.2	62.0	12.7
Year 3	0.6	1.9	63.0	1.1	38.2	0.2	30.2	3.0
Year 4	<0.1	2.4	67.9	0.6	25.6	<0.1	9.7	0.3
Years 1-4 combined	0.6	1.1	40.3	15.9	28.5	<0.1	65.0	4.9

Note: The average fee received by beneficiaries in our intent-to-treat analysis was $18 PBPM in Year 1, $17 in Year 2, $14 in Year 3, and $11 in Year 4, for an average of $15 PBPM over the 51-month intervention period. The decline in fees received is due not only to the decline in the care management fees paid for attributed beneficiaries, but also to the fact that beneficiaries attributed to practices in early years were no longer attributed to the practice in later years, so the practice received no care management fees for those patients in the later years. Also, no care management fees were paid for patients attributed to withdrawn or terminated practices after those practices stopped participating.

e. Results of sensitivity tests

Results for Medicare expenditures were not sensitive to various alterations to the model and analysis sample. Similar to findings in prior reports, the main results remained unchanged in these sensitivity tests, with a few exceptions that are discussed below (Table 8.7). We conducted four types of sensitivity tests to determine whether the estimated impacts on Medicare expenditures without fees from the main difference-in-differences model were robust to changing the estimation strategy or the model specification, and to rule out alternative explanations for the findings. The sensitivity tests assessed the results of varying (1) the assumptions underlying the difference-in-differences estimation approach, (2) the composition of the analysis sample, (3) the definition of the comparison group, and (4) the model specification.

- Results were similar to those of our main model for most of these sensitivity tests. For example, we obtained similar estimates when we altered our difference-in-differences approach by (1) extending the baseline period, (2) changing the definition of the comparison group, (3) changing the definition of the analysis sample (by following only beneficiaries attributed in Quarter 1 and not those attributed later), or (4) changing the definition of only the baseline sample (restricting the baseline sample to those attributed in Quarter 1 or Year 1 of CPC). Also, results were robust to changing the model specification, for example, using practice fixed effects, a generalized linear model with a log link, or models with expenditures trimmed to reduce the effects of high-cost cases. Similarly, excluding CPC practices that withdrew during the course of the initiative and their matched comparison practices did not substantively alter the pattern of findings.

- Because the rate of participation in Medicare ACOs grew to 42 percent among comparison practices by 2016, and CPC practices could not participate in other Medicare initiatives such as ACOs while remaining in CPC, we included a regression control variable indicating whether practices had participated in CPC or in a Medicare ACO by the end of Year 3 (or by December 2015).[92] Including this control variable made the estimate for Medicare expenditures less favorable to CPC practices in Year 4, which is the opposite of what we would expect if ACOs in the comparison group were muting the effects of CPC.
- Finally, as reported above, a Bayesian analysis allowing the estimated effects in a given region to depend in part on the CPC-wide effects showed overall estimates for Medicare expenditures very similar to those of our main estimates. The Bayesian estimates for individual regions showed less variability across regions and time periods, by design.

However, our results did differ from our main findings in models that split the comparison group into the practices drawn from the internal regions and the practices drawn from the external regions (Table 8.7):

- First, we explored the possibility of contamination. To do this, we compared CPC practices to rematched comparison practices in external regions only, to remove the possibility that CPC had an influence on comparison group practices. In this model, the estimated cumulative effect on Medicare expenditures without fees was somewhat smaller (that is, less favorable); it decreased from -\$9 to -\$4 PBPM and was still not statistically significant. Conversely, comparing CPC practices to only matched comparison practices within the CPC region that had applied to CPC (the internal comparison group) yielded a larger, favorable cumulative estimate of -\$22 PBPM that was statistically significant. Thus, results using the internal comparison group were more favorable than those using the external comparison group, suggesting that contamination did not lead CPC to appear to have less favorable impacts.
- Second, we further explored results from the internal comparison group to see whether those might be biased by the fact that internal practices that were selected to participate in CPC would have more advanced features (which in turn might lead to better outcomes) than those not selected to participate. We ran a regression that compared CPC practices against all unselected applicants that met CMS's eligibility criteria (including practices that were and were not selected to be in the CPC comparison group by matching) while controlling for the application score (the primary criteria used in CMS's selection process for CPC). We found that there was a statistically significant -\$15 PBPM effect of CPC on Medicare expenditures

---

[92] Among comparison practices participating in Medicare ACOs, most were participating in SSP. About 6 percent of the original set of CPC practices were also in SSP by the end of 2016, as some CPC practices that withdrew from the initiative went on to participate in SSP.

without fees, and the application score control variable was not statistically significant. Although results from the internal comparison group were more favorable, they showed a large favorable estimate in Year 1 (see Peikes et al. 2016b), before CPC practices would likely have had enough time for practice transformation to affect expenditures.

The findings from the tests using only internal or external comparison practices suggest that internal comparison practices did not benefit from any potential spillover effects due to CPC's presence in their region; rather, it is possible that results using the external comparison group were less favorable than those using the internal group due to differences (or differential changes since baseline) in unobserved market-level factors between CPC and comparison regions. However, it is also possible that the process CMS used to select practices, which was intended to identify the strongest and most motivated practices for CPC, resulted in favorable selection; we could not fully control for this effect.

Table 8.7. Estimates of the cumulative impact on PBPM Medicare expenditures without fees, from sensitivity tests

Test	Motivation	Cumulative estimate	*p*-value	90% CI lower bound	90% CI upper bound
Main analysis		-$9	0.16	-$19	$2
Use two-year baseline (instead of one year)	Controls for longer pre-CPC trend	-$9	0.11	-$19	$0
Follow only beneficiaries attributed in Quarter 1	Removes any effects that might be due to changes in sample composition over time, for both baseline and follow-up years	-$5	0.54	-$17	$8
Hold the baseline sample fixed by only including beneficiaries attributed in Year 1, while allowing new beneficiaries to enter the sample during the intervention years	Examines the sensitivity of the impact estimate to changing the baseline sample	-$8	0.22	-$19	$3
Hold the baseline sample fixed by only including beneficiaries attributed in Quarter 1, while allowing new beneficiaries to enter the sample during the intervention years	Examines the sensitivity of the impact estimate to changing the baseline sample	-$9	0.44	-$28	$10
Control for Medicare ACO participation of matched comparison practices at the end of 2015 when predicting expenditures in Year 4 of CPC, so that the difference-in-differences estimate is now based on CPC practices being compared against matched comparison practices that are not Medicare ACOs	Examines whether the Year 4 impact estimate is weakened due to the greater Medicare ACO participation of comparison practices	$7[a]	0.50	-$11	$25

Table 8.7 *(continued)*

Test	Motivation	Cumulative estimate	*p*-value	90% CI lower bound	90% CI upper bound
Using external comparison group only, compare CPC practices with rematched external comparison practices	By using only rematched practices from external practices (along with new matching weights), removes potential spillover effects of CPC and adverse selection from unselected applicants	-\$4	0.53	-\$14	\$6
Using internal comparison group only, compare selected applicants with rematched nonselected applicants	Removes any effect of changes in markets over time by using only the internal market, and also controls for motivation that led both selected and nonselected applicants to apply for CPC	-\$22***	0.005	-\$36	-\$9
Using internal comparison group only, compare selected applicants to all nonselected applicants while controlling for CPC application score	Controls for changes in market over time by using only internal market and reduces selection bias by using only applicants and controlling for application score	-\$15**	0.02	-\$26	-\$5
Practice fixed effects	Removes time-invariant unobserved variable bias	-\$9	0.15	-\$19	\$1
Matched set fixed effects	Removes time-invariant unobserved variable bias	-\$9	0.16	-\$19	\$2
Generalized linear model with log link	Handles skewed expenditure distribution	-\$11*	0.06	-\$20	-\$1
Trimmed expenditures at 98th percentile	Reduces influence of high-cost beneficiaries	-\$7	0.18	-\$16	\$2
Log expenditures[b]	Reduces influence of high-cost beneficiaries	-0.5%	0.51	-1.9%	0.8%

[a] Unlike in the other tests, the impact estimate from controlling for Medicare ACO status of comparison practices at the end of 2015 is for Year 4 (October 2015–December 2016) only.

[b] The percentage impact based on the main analysis was 1 percent.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ACO = accountable care organization; CI = confidence interval; CPC = Comprehensive Primary Care initiative.

f. Results for subgroups of patients and practices

Effects for the highest-risk beneficiaries were similar to effects for all beneficiaries. Because there are usually more opportunities to improve care and reduce expenditures for high-risk patients, we studied whether impacts varied for *beneficiaries* who were in the top quartile of the distribution of HCC risk scores when they were first attributed. We found that average monthly Medicare expenditures PBPM without care management fees grew \$8 (or 1 percent, $p = 0.64$) less for the high-risk beneficiaries in CPC practices than for those in the comparison group during CPC, but the difference was not statistically significant (Table 8.3). This was similar in magnitude and about the same percentage impact as it was for all beneficiaries. The effect size for annual impacts on total Medicare expenditures was larger for high-risk beneficiaries than for all beneficiaries in Year 1, but the percentage impacts were similar for high-risk and all beneficiaries. For the other three years, estimates for high-risk beneficiaries were somewhat less favorable than for all beneficiaries. Specifically, in Year 1, expenditures without fees grew $34, or 2 percent ($p = 0.07$) less for high-risk patients in CPC practices than for high-risk patients in comparison practices, driven by a sizeable effect on inpatient expenditures. The impact estimates were close to zero in the second and third program years, and in the fourth year expenditures without fees for high-risk beneficiaries in CPC practices relative to high-risk beneficiaries in comparison practices increased by $12 PBPM (or 1 percent, $p = 0.58$), mainly driven by a relative increase in expenditures on physician services.

We also examined whether impacts varied for two other high-risk subgroups of beneficiaries, defined based on incidence of specific chronic conditions and hospitalizations at baseline. Although estimates for these subgroups were larger, they were similar in percentage terms to estimates for the full sample, and were also not statistically significant.[93]

Some subgroups of practices showed statistically significant savings. We also studied whether impacts on expenditures varied for subgroups of *practices.* We examined variation in impacts for subgroups of practices defined using characteristics, including practices that (1) were recognized as PCMHs by NCQA or their state before CPC began;[94] (2) were more likely to have greater access to resources for transformation (because they had six or more physicians or were affiliated with a larger organization before CPC began); (3) were owned by either a hospital or a system (during the initiative); (4) were small (1 or 2 physicians), medium (3 to 5 physicians), or large (6 or more physicians); or (5) had no physician who met the meaningful use criteria at baseline.

Although estimated impacts were significantly different from zero for some of the subgroups we examined, none of the impact estimates for a given subgroup significantly differed from those of their complement or counterpart, so we cannot draw strong conclusions about differences across subgroups (Table 8.8). Over the four years, the CPC group had significantly less growth in Medicare expenditures than the comparison group within the following subgroups: practices recognized as PCMHs at baseline (-$17 or 2 percent, $p = 0.06$), practices that had six or more physicians or were affiliated with a larger organization (-$13 or 1 percent, $p = 0.06$),

---

[93] These two subgroups were defined as follows: (1) beneficiaries who had at least one of the following chronic conditions—congestive heart failure, chronic obstructive pulmonary disease, acute myocardial infarction, or ischemic heart disease—and at least one hospitalization in the year before CPC; and (2) beneficiaries who had at least 2 of 13 chronic conditions (congestive heart failure, chronic obstructive pulmonary disease, acute myocardial infarction, ischemic heart disease, diabetes, any cancer other than skin cancer, stroke, depression, dementia, atrial fibrillation, osteoporosis, rheumatoid arthritis or osteoarthritis, and chronic kidney disease) and at least two hospitalizations in the two years before CPC. Compared with our main estimate, the estimated impacts were larger in these subgroups with cumulative difference-in-differences estimates of -$23 ($p = 0.44$) and -$45 ($p = 0.23$), respectively, although similar in terms of percentage impacts (1 and 2 percent, respectively, versus 1 percent for the overall results). Also, the subgroup-specific impact was not significantly different from the main impact estimate in either case ($p = 0.61$ and 0.30, respectively).

[94] Although other sources of PCMH recognition exist, we used only NCQA and state recognition because we did not have data from other certifying organizations for both the CPC and comparison practices. Nearly 40 percent of CPC practices were recognized as a medical home by NCQA or their state when they applied to CPC, and about 80 percent of those with any medical home recognition received it from one of these two sources.

hospital- or system-owned practices (-\$18 or 2 percent, $p = 0.02$), and medium-sized practices with 3 to 5 clinicians (-\$16 or 2 percent , $p = 0.09$). However, the impacts were not significantly different when we compared these subgroups to their counterparts. For example, favorable and statistically significant impacts within the subgroup of practices that were recognized as a PCMH at baseline did not differ significantly from those of practices that did not have PCMH recognition. Similarly, favorable and statistically significant impacts for practices that were hospital- or system-owned, or met the criteria of having six or more physicians or affiliation with a larger organization did not differ significantly from those of their counterparts.[95] Therefore, the evidence for larger impacts within any of these practice subgroups is weak, especially because applying any correction for multiple comparisons or multiple hypothesis testing would make it even less likely to find statistically significant differences, given that we tested for differential impacts for subgroups defined by seven practice characteristics.

Table 8.8. Variation in cumulative impact on PBPM Medicare expenditures without fees, by practice characteristics at baseline

Practice subgroup definition, based on baseline characteristics	Impact estimate for practices that met the subgroup definition (standard error)	Impact estimate for practices that did not meet the subgroup definition (standard error)	*p*-value from test of significant difference in impacts between subgroups
PCMH recognition	-\$17* (\$9)	-\$3 (\$8)	0.27
Six or more physicians or affiliated with a larger organization	-\$13* (\$7)	\$2 (\$12)	0.27
Hospital-owned	-\$22** (\$9)	-\$9 (\$7)	0.27
System-owned	-\$18** (\$8)	-\$10 (\$8)	0.44
Either hospital- or system-owned	-\$18** (\$7)	-\$10 (\$9)	0.49
Had a meaningful user of EHRs	-\$7 (\$7)	-\$17 (\$11)	0.41
Large and medium, versus small practice, based on number of clinicians[a]	Large: -\$11 (\$10) Medium: -\$16* (\$9)	\$7 (\$13)	Large versus small: 0.27 Medium versus small: 0.15

Note: Information on hospital and system ownership, obtained from SK&A, was not available for 7 CPC and 48 comparison practices. We excluded these 55 practices from the subgroup analyses based on hospital and system ownership variables.

[a] Small, medium, and large practices were defined as those with 1–2 clinicians, 3–5 clinicians, and 6 or more clinicians, respectively.

---

[95] Although we matched CPC and comparison practices on several of these baseline practice characteristics, it is unlikely that CPC and matched comparison group practices within each of these subgroups were as well-balanced in all baseline characteristics as the full sample (with the exception of the subgroup for whether a practice had a meaningful EHR user at baseline, which was an exact-match variable). Therefore, although we controlled for most of these baseline characteristics in our regressions, the estimates for specific subgroups could be distorted by baseline differences between the CPC and comparison practices within those subgroups.

g. Medicare expenditures including CPC and SSP shared savings payments

After adding the shared savings amounts that Medicare paid for CPC and SSP through 2015, the CPC-wide estimates for Medicare expenditures (including fees and shared savings) showed little or no change in magnitude or statistical significance compared to the estimates for net Medicare expenditures including fees, as reported above (Table 8.3). In other words, including shared savings amounts did not, in general, change impact estimates for total Medicare expenditures. The only exception was for Oklahoma in Year 3, where the estimate became more unfavorable or larger in magnitude for all beneficiaries (estimated increase of $14 PBPM more for CPC than comparison practices, compared to an increase of $2 PBPM before, without shared savings). This is consistent with Oklahoma practices receiving a large share of the total CPC shared savings payments in Year 3—$10 million out of the total $13 million paid to all regions in 2015.

8.3.2. Service use

While service use in both CPC and comparison practices grew over time, there was less growth for CPC than comparison practices in the use of some, but not all, types of services. Among all beneficiaries, cumulative impact estimates showed modest, statistically significant favorable effects on hospitalizations, total ED visits, outpatient ED visits, and office-based primary care visits over the course of the initiative (Tables 8.1 and 8.5). The exception was that there was a relative increase in the number of observation stays over all four years of CPC combined. The favorable effects on ED visits were concentrated in the last two years of CPC; the magnitude of favorable effects on hospitalizations was relatively stable over time.

CPC reduced the growth in hospitalizations, ED visits, and primary care visits by 2 percent for CPC versus comparison practices (Table 8.3). Relative to the comparison group, during the four years of CPC, hospitalizations for beneficiaries in CPC practices increased by 2 percent less (five fewer admissions per 1,000 beneficiaries per year) ($p = 0.07$). Similarly, total ED visits for CPC practices relative to comparison practices increased by 2 percent less (14 fewer visits per 1,000 beneficiaries per year) ($p < 0.01$);[96] outpatient ED visits for CPC practices increased by 2 percent less (10 fewer visits per 1,000 beneficiaries per year) ($p = 0.03$); and primary care visits in office-based settings increased by 2 percent less (68 fewer visits per 1,000 beneficiaries per year) ($p = 0.07$). Primary care visits in all settings also increased by 1 percent less for beneficiaries in CPC than comparison practices; however, this estimate was not statistically significant ($p = 0.14$).[97] Relative to the comparison group, observation stays for beneficiaries in CPC practices increased by 5 percent more (three additional stays per 1,000 beneficiaries per year) ($p = 0.03$). (This difference offset over half the estimated relative reduction of five inpatient admissions per 1,000 beneficiaries.) A 1 percent larger increase in specialist visits in all settings among beneficiaries in CPC than comparison practices over the life of the initiative was not statistically significant ($p = 0.31$).

---

[96] Total ED visits include both outpatient ED visits and ED visits that led to an inpatient hospitalization.

[97] Primary care visits in all settings include office-based primary care visits as well as visits in other settings, such as in a hospital or nursing home.

Favorable impacts for some types of Medicare service use became more pronounced over time (Table 8.3). For both total ED visits and outpatient ED visits, favorable estimates in Years 1 and 2 were small and not statistically significant. In contrast, the favorable effects on total ED visits for CPC practices versus comparison practices were 17 per 1,000 beneficiaries in Year 3 and 18 per 1,000 beneficiaries in Year 4 (about 2 percent of the comparison group mean, $p < 0.01$ in both cases). We observed a similar pattern for outpatient ED visits, with slower growth of 15 and 13 per 1,000 beneficiaries (or 3 percent) in Years 3 and 4, respectively ($p < 0.01$ and $p = 0.02$) among CPC than comparison practices. For hospitalizations, however, the magnitude of favorable impacts did not change. Finally, one unfavorable impact emerged in Year 4; although the estimate for specialist visits in all settings was close to zero in Years 1 through 3, specialist visits in all settings among all beneficiaries and high-risk beneficiaries increased by 2 percent more in CPC than comparison practices in Year 4. Based on the regression-adjusted means, this was mainly driven by larger increases in specialist visits in the CPC group than in the comparison group during the last two years of CPC. However, the difference in office-based specialist visits for beneficiaries in CPC versus comparison practices was less pronounced, with the largest estimate implying a 2 percent ($p = 0.14$) relative increase in Year 4.

Estimates for service use outcomes for high-risk beneficiaries were generally similar to those for all beneficiaries but not statistically significant. Among high-risk beneficiaries, the only statistically significant cumulative estimate for Medicare service use was for office-based primary care visits, which declined by 110 per 1,000 beneficiaries, or 2 percent more in the CPC group than in the comparison group ($p = 0.07$).

8.3.3. Claims-based quality of care

We found minimal effects on the claims-based quality-of-care process and outcome measures we examined. There were very few sizeable or statistically significant estimates for the quality-of-care *process* measures among beneficiaries with diabetes, or in transitional care measures among all beneficiaries during the course of the initiative. The only significant findings for quality-of-care process measures among beneficiaries with diabetes were in the high-risk subgroup. Similarly, for continuity of care, there were no statistically significant effects through Year 4. For quality-of-care *outcome* measures, the only statistically significant impact was favorable, showing a smaller increase in the likelihood of ED revisits among all beneficiaries for CPC versus comparison practices, which is consistent with the favorable effects on ED visits. Our analysis of quality of care looked only at a limited set of claims-based measures, and did not include the eCQMs used for quality improvement and for calculating shared savings. Not all comparison practices reported eCQMs, creating both conceptual and data challenges for analyzing the impact of CPC on eCQMs.

For the quality-of-care process measures among beneficiaries with diabetes, none of the cumulative impact estimates were sizeable or statistically significant for all beneficiaries or high-risk beneficiaries (Table 8.9). The only cumulative estimate suggesting a possible (but not quite statistically significant) improvement was for high-risk beneficiaries. It showed a 1.2 percentage point larger increase in the likelihood of high-risk beneficiaries with diabetes receiving all three tests (HbA1c, eye exam, and urine protein testing) in CPC than comparison practices ($p = 0.12$). In general, the results for quality-of-care process measures among beneficiaries with diabetes suggest substantial opportunities for improvement, since only about one-third of beneficiaries received all three recommended tests in any given year of CPC.

In yearly estimates, there were a few sporadic and mixed effects on quality-of-care process measures for high-risk beneficiaries with diabetes. Specifically, in year-by-year estimates, there were two statistically significant findings among the high-risk beneficiaries only—one unfavorable and the other favorable. In an unfavorable finding, the likelihood of HbA1c testing among high-risk beneficiaries with diabetes increased less for CPC than comparison practices by 1.1 percentage points or 1 percent ($p = 0.09$), and 1.3 percentage points or 1.5 percent ($p = 0.05$) in Years 2 and 3, respectively, and the estimate in Year 4 was close to zero. On the other hand, consistent with the cumulative estimate for one of the summary measures, the likelihood of a high-risk beneficiary with diabetes receiving all three tests (HbA1c, eye exam, and urine protein testing) increased by close to 2 percentage points more for CPC than comparison practices (about 5 percent, $p = 0.07$) in Year 2, but smaller 1.5 and 1.2 percentage point increases in Years 1 and 4 were not significant. The small magnitudes and erratic pattern of these estimates over time and across measures suggest that the two statistically significant estimates are likely to be spurious differences due to chance, rather than evidence of important impacts.

There were no statistically significant effects on any of the continuity-of-care measures. For all four measures—the percentage of primary care visits at the beneficiary's attributed practice, the percentage of all primary and specialty care visits at the attributed practice, the Bice-Boxerman index based on primary care visits, and the Bice-Boxerman index based on all visits—continuity declined similarly for both the CPC and comparison groups by 4 to 14 percentage points between the four-year period before CPC began and the four years during CPC.[98] Although the impact estimates were negative in most cases, suggesting marginally greater decline for the CPC group, these were all less than 1 percent and not statistically significant. It is possible that CPC practices used the non-visit-based care management fees to cover some interactions with their patients for which they did not bill, which would make the claims-based continuity measures look worse than continuity really was for CPC practices.

CPC led to a slower increase in the likelihood of an ED revisit within 30 days of an outpatient ED visit, but had no discernible effect on other quality-of-care outcome measures. For the quality-of-care outcome measures, there were no statistically significant effects on either ACSC admissions or the likelihood of an unplanned 30-day readmission among all beneficiaries or high-risk beneficiaries. The lack of significant effects for ACSC admissions and 30-day readmissions could be due to practices having limited opportunities to affect these outcomes since they occur relatively infrequently. For example, the average number of ACSC admissions was only about 65 per 1,000 beneficiaries among beneficiaries in CPC practices during Year 4 of CPC. Similarly, the rates of 30-day readmissions at the discharge and

---

[98] For our continuity-of-care measures, the baseline period consisted of the four years before the start of CPC (October 2008–September 2012), and the intervention period was the four years after the start of CPC (October 2012–September 2016). The fall in continuity for both CPC and comparison groups reflects how we constructed the measures. Because continuity was measured with respect to the practice that the patient was attributed to in Quarter 1, continuity was high before CPC began, by definition, for both the CPC and comparison groups. (This period overlaps with the Quarter 1 look-back period, and beneficiaries had to have a plurality of their visits at a practice during this look-back period to be attributed to that practice.) It is not surprising that continuity fell over time, because beneficiaries who were attributed to different practices after CPC began by definition had low continuity with the practice to which they were attributed in Quarter 1.

beneficiary levels were only about 15 percent and 3 percent, respectively, in Year 4 of CPC.[99] At the beneficiary level, the rate of ED revisits within 30 days of an outpatient ED visit was also low, but higher than the rate of 30-day hospital readmissions, at 6 percent in Year 4, for both the CPC and comparison groups. Despite the modest incidence of ED revisits, we did see less growth in ED revisits of 0.2 percentage points, or 3 percent, during the initiative among beneficiaries in CPC versus comparison practices (Table 8.9). In yearly estimates for all beneficiaries, statistically significant and favorable estimates of the same magnitude first emerged in Years 3 and 4. This finding is consistent with the significantly slower increases in both outpatient and total ED visits observed for all beneficiaries in CPC than comparison practices during Years 3 and 4 of CPC.

---

[99] There has also been a nationwide decline in readmissions among Medicare beneficiaries due to other ongoing CMS programs (Daughtridge et al. 2014). This could have made it harder for CPC practices to achieve a greater decline in readmissions relative to matched comparison practices.

Table 8.9. Regression-adjusted means and estimated difference-in-differences estimates of CPC's impact on selected quality-of-care process and outcome measures: annual and four-year cumulative CPC-wide estimates

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Quality-of-care process measures for beneficiaries with diabetes (percentage point changes)												
Among beneficiaries with diabetes – HbA1c test												
Baseline	88.1	87.8	-	-	-	-	85.3	84.5	-	-	-	-
Year 1	89.5	89.6	-0.4	0.4	-	0.383	87.3	87.5	-0.9	0.6	-	0.133
Year 2	90.3	90.2	-0.2	0.5	-	0.690	88.4	88.8	-1.1*	0.7	-	0.088
Year 3	90.8	90.7	-0.2	0.5	-	0.731	89.4	90.0	-1.3*	0.7	-	0.054
Year 4	90.8	90.7	-0.1	0.4	-	0.840	89.7	88.8	0.1	0.7	-	0.895
Years 1–4 combined	90.3	90.3	-0.2	0.4	-	0.604	88.9	89.0	-0.8	0.5	-	0.105
Among beneficiaries with diabetes – eye exam												
Baseline	53.6	53.7	-	-	-	-	53.0	53.3	-	-	-	-
Year 1	56.0	55.4	0.7	0.7	-	0.288	56.0	55.3	1.0	0.9	-	0.300
Year 2	56.1	55.4	0.9	0.6	-	0.125	55.8	55.0	1.2	0.9	-	0.205
Year 3	57.9	57.7	0.3	0.8	-	0.662	57.5	57.2	0.6	1.0	-	0.544
Year 4	57.9	58.3	-0.3	0.9	-	0.756	57.7	57.2	0.8	1.3	-	0.534
Years 1–4 combined	57.7	57.5	0.4	0.6	-	0.506	57.6	57.1	0.9	0.8	-	0.252
Among beneficiaries with diabetes – urine protein test												
Baseline	56.0	56.7	-	-	-	-	61.3	62.1	-	-	-	-
Year 1	60.1	60.4	0.3	0.8	-	0.729	64.3	64.1	1.0	1.0	-	0.314
Year 2	63.0	62.5	1.2	1.0	-	0.225	66.5	65.9	1.4	1.0	-	0.154
Year 3	63.9	65.1	-0.6	1.4	-	0.685	73.7	75.0	-0.5	1.4	-	0.743
Year 4	65.1	66.2	-0.5	1.4	-	0.712	75.5	77.3	-1.0	1.3	-	0.428
Years 1–4 combined	64.0	64.6	0.0	0.9	-	0.962	70.1	70.7	0.3	0.9	-	0.768
Among beneficiaries with diabetes – all 3 tests performed												
Baseline	31.9	32.8	-	-	-	-	32.9	34.3	-	-	-	-
Year 1	35.4	35.7	0.6	0.7	-	0.396	36.9	36.8	1.5	1.0	-	0.154
Year 2	36.6	36.5	1.1	0.8	-	0.173	37.4	37.1	1.7*	0.9	-	0.067
Year 3	35.8	37.3	-0.5	0.9	-	0.611	40.6	41.5	0.4	1.1	-	0.691
Year 4	36.6	37.5	0.1	0.9	-	0.928	42.0	42.2	1.2	1.2	-	0.321
Years 1–4 combined	36.8	37.5	0.3	0.6	-	0.645	39.9	40.1	1.2	0.8	-	0.116

Table 8.9 *(continued)*

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Among beneficiaries with diabetes – none of the 3 tests performed												
Baseline	6.0	6.4	-	-	-	-	6.4	7.0	-	-	-	-
Year 1	4.9	5.0	0.3	0.4	-	0.338	5.1	5.4	0.4	0.5	-	0.404
Year 2	4.2	4.7	-0.1	0.3	-	0.665	4.4	4.9	0.2	0.4	-	0.725
Year 3	2.5	2.6	0.3	0.4	-	0.458	2.3	2.2	0.8	0.5	-	0.136
Year 4	2.7	2.4	0.6	0.4	-	0.110	2.2	2.4	0.4	0.5	-	0.398
Years 1–4 combined	3.4	3.5	0.3	0.3	-	0.359	3.4	3.6	0.4	0.4	-	0.267
Total number of observations (CPC and comparison) across all years: beneficiaries with diabetes[a]	750,737						261,394					
Continuity of care (percentage)												
Percentage of PCP visits at attributed practice												
Baseline	79.6	76.9	-	-	-	-	76.1	72.8	-	-	-	-
Years 1–4 combined	64.8	62.8	-0.7	0.9	-1.1%	0.434	63.0	60.3	-0.5	1.0	-0.8%	0.602
Percentage of all visits at attributed practice												
Baseline	45.4	45.6	-	-	-	-	38.9	39.1	-	-	-	-
Years 1–4 combined	35.4	35.7	-0.1	0.6	-0.4%	0.836	32.4	32.5	0.2	0.7	0.6%	0.770
Bice-Boxerman Index based on PCP visits												
Baseline	72.0	69.5	-	-	-	-	68.4	65.7	-	-	-	-
Years 1–4 combined	62.4	60.5	-0.6	0.8	-1.0%	0.434	61.3	59.0	-0.3	0.8	-0.6%	0.660
Bice-Boxerman Index based on all visits												
Baseline	33.5	33.5	-	-	-	-	28.0	28.1	-	-	-	-
Years 1–4 combined	29.0	29.2	-0.2	0.4	-0.6%	0.616	26.7	26.8	0.1	0.4	0.2%	0.891
Total number of observations (CPC and comparison) across all years: measures based on PCP visits[b]	1,506,804						487,138					

Table 8.9 *(continued)*

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Total number of observations (CPC and comparison) across all years: measures based on all visits[c]	1,718,474						547,940					
Transitional care and quality-of-care outcomes (annualized rate per 1,000 or percentage)												
Likelihood of 14-day follow-up visit (percentage)												
Baseline	62.1	62.0	-	-	-	-	66.9	66.9	-	-	-	-
Year 1	63.0	63.0	-0.1	0.6	-	0.900	67.6	67.9	-0.4	0.6	-	0.588
Year 2	64.9	64.5	0.3	0.6	-	0.653	69.4	69.2	0.1	0.7	-	0.868
Year 3	65.6	65.0	0.4	0.6	-	0.540	69.7	69.8	-0.1	0.7	-	0.852
Year 4	67.4	67.6	-0.4	0.6	-	0.488	71.7	71.8	-0.1	0.6	-	0.821
Years 1–4 combined	66.0	65.9	0.0	0.5	-	0.999	69.8	69.8	-0.1	0.6	-	0.808
Total number of observations (CPC and comparison) across all years: follow-up visit[d]	1,675,235						867,707					
ACSC admissions (annualized rate per 1,000 beneficiaries)												
Baseline	37.0	39.5	-	-	-	-	112.9	118.5	-	-	-	-
Year 1	55.7	57.5	0.7	1.1	0.9%	0.563	151.1	154.1	2.6	3.6	1.6%	0.462
Year 2	56.7	58.2	1.0	1.2	1.5%	0.411	147.1	148.4	4.3	3.7	2.9%	0.237
Year 3	62.5	64.5	0.5	1.2	0.7%	0.696	157.3	161.9	1.0	4.0	0.6%	0.811
Year 4	65.5	68.3	-0.3	1.3	-0.5%	0.801	162.4	166.4	1.6	4.2	1.0%	0.699
Years 1–4 combined	68.2	70.5	0	1.0	0.7%	0.668	161.2	164.6	2.5	3.1	1.6%	0.421
Total number of observations (CPC and comparison) across all years: ACSC admissions[e]	6,575,258						1,731,832					

Table 8.9 *(continued)*

	All attributed Medicare beneficiaries						High-risk attributed Medicare beneficiaries					
	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact	CPC practices' regression-adjusted mean	Comparison group practices' regression-adjusted mean	Estimated impact (size)	Standard error for impact estimate	Estimated impact (%)	*p*-value for estimated impact
Likelihood of 30-day readmission (percentage)												
Baseline	13.3	13.3	-	-	-	-	16.5	16.8	-	-	-	-
Year 1	14.7	15.2	-0.5	0.3	-	0.111	18.5	19.0	-0.3	0.5	-	0.482
Year 2	14.4	14.5	-0.1	0.3	-	0.767	17.9	17.9	0.2	0.5	-	0.694
Year 3	14.9	15.0	-0.1	0.3	-	0.850	18.6	18.6	0.2	0.5	-	0.654
Year 4	14.7	14.9	-0.2	0.3	-	0.488	18.1	18.3	0.0	0.5	-	0.993
Years 1–4 combined	14.7	14.9	-0.2	0.3	-	0.408	18.0	18.2	0.0	0.4	-	0.986
Total number of observations (CPC and comparison) across all years: readmissions[f]	1,675,788						867,904					
Likelihood of an ED revisit within 30 days of an outpatient ED visit (percentage)												
Baseline	3.9	3.9	-	-	-	-	8.9	9.0	-	-	-	-
Year 1	3.9	3.9	0.0	0.1	-	0.770	8.2	8.2	0.1	0.2	-	0.582
Year 2	4.3	4.3	0.0	0.1	-	0.801	8.7	8.7	0.1	0.2	-	0.719
Year 3	4.8	5.1	-0.3***	0.1	-	0.003	9.5	9.7	-0.1	0.3	-	0.840
Year 4	6.0	6.4	-0.3***	0.1	-	0.001	11.5	11.9	-0.3	0.3	-	0.355
Years 1–4 combined	5.2	5.5	-0.2**	0.1	-	0.020	9.7	9.8	0.0	0.2	-	0.871
Total number of observations (CPC and comparison) across all years: ED revisit[e]	6,575,258						1,731,832					

Source: Medicare claims data for October 2008 through December 2016.

Note: Impact estimates are regression-adjusted for baseline beneficiary characteristics (including HCC scores) and baseline practice characteristics. Each impact estimate is based on a difference-in-differences analysis and reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC practices in the intervention period compared with the baseline period relative to the same difference over time for attributed Medicare FFS beneficiaries in matched comparison practices. For the ED revisit equation, we also controlled for chronic conditions at baseline. For the readmissions and follow-up visits equations estimated at the discharge level, we also controlled for discharge-level risk factors. Number of observations includes the total number of CPC and comparison group observations across all years. For continuous quality-of-care outcome measures, we present the absolute impact estimate as well as its relative size in percentage terms. For binary quality-of-care outcome measures, we only present the absolute impact estimate in percentage points. Regression-adjusted means for each year and for both groups from the annual regression were obtained by using average values of the control variables among beneficiaries in CPC practices in Year 4, in order to hold beneficiary and practice attributes fixed in generating predictions. Regression-adjusted means from the cumulative regression were obtained by using average values of the control variables among beneficiaries in CPC practices across all four CPC years. Regression-adjusted means from the cumulative regression are similar but not always perfectly aligned with those from the annual

Table 8.9 *(continued)*

regression due to differences in coefficients on control variables and the different samples used for predictions; however, the impact estimate from the cumulative regression is within the range of values for the impact estimates from the annual regression.

[a] For the quality-of-care process measures for beneficiaries with diabetes, the analysis includes 88,217 Medicare FFS beneficiaries attributed to 497 CPC practices and 190,451 beneficiaries attributed to 908 matched comparison practices.

[b] For continuity-of-care measures based on PCP visits, the analysis includes 261,324 beneficiaries in CPC practices and 492,078 beneficiaries in comparison practices.

[c] For continuity-of-care measures based on all visits, the analysis includes 290,776 beneficiaries in CPC practices and 568,461 beneficiaries in comparison practices.

[d] For 14-day follow-up visits, the analysis includes 229,415 beneficiaries in CPC practices and 488,664 beneficiaries in comparison practices.

[e] For ACSC admissions and ED revisit measures, the analysis includes 556,674 beneficiaries in CPC practices and 1,165,284 beneficiaries in comparison practices.

[f] For 30-day readmission measures, the analysis includes 229,458 beneficiaries in CPC practices and 488,782 beneficiaries in comparison practices.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ACSC = ambulatory care sensitive condition; ED = emergency department; FFS = fee-for-service; HCC = Hierarchical Condition Category; PCP = primary care physician.

8.3.4. Aggregate impacts of CPC for all attributed beneficiaries

We calculated aggregate impacts of CPC, by year, across all Medicare FFS beneficiaries attributed to CPC practices, for six outcome measures: (1) total Medicare expenditures without fees, (2) number of hospitalizations, (3) number of outpatient ED visits, (4) number of primary care clinician visits in all settings, (5) number of office-based primary care clinician visits, and (6) 30-day unplanned readmissions. For the first five outcomes, we used the beneficiary-level estimates from the difference-in-differences regressions, together with the total eligible months for beneficiaries attributed to CPC practices in each year, to obtain the aggregate impacts as well as the 90 percent confidence intervals for these impacts. For readmissions, we used the discharge-level estimates and the total discharges for all beneficiaries in CPC practices to obtain these aggregate impacts, by year (Table 8.10). We obtained cumulative aggregate impacts by adding yearly aggregates over the four years of CPC, and calculated confidence intervals for the sums, taking into account the correlation of the estimates across years. With all four years of CPC impact estimates now available, the cumulative aggregate estimates offer a complete picture of relative reductions in utilization of key services like hospitalizations and outpatient ED visits over the life of the initiative.

Based on the 90 percent confidence intervals, statistically significant aggregate estimates are shown in bold font in Table 8.10. For the outcomes examined, there were "relative reductions" because utilization and expenditures increased less over time for CPC practices relative to comparison practices. Cumulative aggregate estimates for Medicare expenditures, hospitalizations, outpatient ED visits, primary care visits, and 30-day readmissions were as follows:

- Savings of over $152 million in total Medicare expenditures without fees over the life of the initiative that were not statistically significant. These savings cover slightly over half (55 percent) of the cumulative care management fees of $278.5 million paid to the CPC practices over the life of the initiative.
- Relative reductions of 8,150 hospitalizations and 15,472 outpatient ED visits over the four years, both of which were statistically significant.
- Relative reductions of 107,785 office-based primary care visits and 137,166 primary care visits in all settings; only the former was statistically significant.
- Relative reduction of 936 30-day readmissions over the four years, which was not statistically significant.

Table 8.10. Aggregate CPC-wide results, by year and cumulative

	Outcome					
	Total Medicare expenditures without fees	Hospitalizations	Outpatient ED visits	Primary care visits in all settings	Office-based primary care visits	30-day readmissions
Year 1						
Estimate	**-$68,569,900**	**-1,862**	-797	-27,867	-11,567	-480
90% CI LL	-$111,373,479	-3,484	-3,271	-55,816	-28,099	-976
90% CI UL	-$25,766,320	-239	1,677	81	4,965	16
Year 2						
Estimate	-$49,190,714	-1,950	-1,509	**-39,027**	**-27,770**	-90
90% CI LL	-$100,511,538	-4,046	-4,625	-75,626	-50,364	-589
90% CI UL	$2,130,110	146	1,606	-2,429	-5,177	409
Year 3						
Estimate	-$19,720,803	-1,229	**-5,962**	-34,500	**-35,227**	-67
90% CI LL	-$81,305,937	-3,547	-9,578	-81,927	-64,802	-645
90% CI UL	$41,864,332	1,089	-2,346	12,926	-5,652	512
Year 4						
Estimate	-$14,870,706	-3,109	**-7,204**	-35,771	-33,221	-299
90% CI LL	-$107,360,416	-6,292	-12,337	-107,732	-79,198	-1,007
90% CI UL	$77,619,003	73	-2,071	36,190	12,757	409
Years 1–4 combined						
Estimate	-$152,352,128	**-8,150**	**-15,472**	-137,166	**-107,785**	-936
90% CI LL	-$360,895,871	-15,789	-27,333	-296,978	-208,920	-2,799
90% CI UL	$56,191,615	-510	-3,610	22,645	-6,650	927

Source: Analysis of Medicare claims data for October 2011 through December 2016.

Notes: This table calculates the estimated effects over all CPC regions and attributed Medicare FFS beneficiaries who were in the intent-to-treat analysis sample for Years 1, 2, 3, and 4 of CPC. The total number of beneficiaries attributed to CPC practices in the annual analysis sample was 365,996 in Year 1, 409,750 in Year 2, 442,160 in Year 3, and 482,287 in Year 4. The number of eligible beneficiary months for the same number of beneficiaries in CPC practices was 3,908,795 in Year 1, 4,451,025 in Year 2, 4,837,588 in Year 3, and 6,505,371 in Year 4.The number of eligible index discharges (for readmissions) was 89,847 in Year 1, 96,696 in Year 2, 108,173 in Year 3, and 141,233 in Year 4. For calculating the cumulative aggregate impacts (across Years 1, 2, 3, and 4 combined), we added the yearly aggregate impacts over the four years. Impact estimates are from difference-in-differences regressions using both patient- and practice-level control variables from the pre-CPC period. See Section 8.2 for a full list of measures and definitions, as well as a discussion of methods. **Green shading** with **bolded text** signifies that estimate was favorable and statistically significant at the $p < 0.10$ level. To help put the gross Medicare savings in perspective, the total care management fees CMS paid for attributed Medicare FFS beneficiaries during the four performance years (2013, 2014, 2015, and 2016) were $90.5 million, $76.1 million, $57 million, and $55.9 million, respectively, for a cumulative payment of $278.5 million, after accounting for total recoupments of about $1 million.

CI = confidence interval; ED = emergency department; LL = lower limit; UL = upper limit.

8.4. Discussion

To recap the findings, during the course of the intervention, CPC practices had favorable findings on service use, with 2 percent less growth than comparison practices in ED visits, hospitalizations, and office-based primary care visits—but had at best a small effect on total Medicare expenditures. Although total monthly Medicare FFS expenditures without Medicare's CPC care management fees increased by $9 less for beneficiaries in CPC than for beneficiaries in comparison practices, this did not fully offset the care management fees Medicare paid, which averaged $15 per month over the course of the initiative. In addition, the Bayesian estimates suggest a high probability of some gross savings, but almost a zero probability that the savings were sufficient to cover Medicare's care management fees.

These expenditure findings were robust. In most of the alternative model specifications that we ran, the estimated effects on Medicare expenditures were small and not statistically significant, similar to our main findings. However, the results for total Medicare expenditures showed an unexpected and implausible pattern, with the annual estimates attenuating over time. Based on Gelman and Carlin's (2014) approach for estimating the degree to which a statistically significant estimate is likely to be overestimated, we determined that the Year 1 effect on total Medicare expenditures of an $18 PBPM decline was likely to be overestimated by a factor of about 1.8.

CPC appeared to generate some savings through reductions in certain areas of service utilization. Specifically, there were statistically significant estimates of relative reductions in expenditures for specific types of services over the course of the initiative, including skilled nursing facilities, outpatient services, and primary care physician services. CPC also led to small relative reductions in hospitalizations, ED visits, and office-based primary care visits. The pattern of effects on ED visits, with larger, statistically significant impacts in the last two years, conforms to the expectation that practice transformation leads to benefits in the long run.[100]

There were minimal effects on claims-based measures of quality of care. Consistent with the findings for ED visits, there was a smaller increase in the likelihood of an ED revisit within 30 days of an outpatient ED visit for CPC than comparison practices during the initiative.

There were some favorable effects within subgroups. In particular, some evidence suggested that medium-sized practices, hospital- or system-owned practices, and practices that were recognized medical homes at baseline were more successful in achieving savings. However, the estimated impacts for these subgroups were not significantly different from the estimates for their respective counterparts. Therefore, the evidence for larger impacts among certain practice subgroups is not conclusive.

The implementation findings help interpret the impact estimates. One might have expected that the attenuation of annual impact estimates for Medicare expenditures from Year 1 to Year 4 was related to the reduction in Medicare's average care management fees from $20 to $15 PBPM in Quarter 10. However, the implementation analysis—including interviews with deep-dive practices—provided little or no evidence that practices decreased resources devoted to care management during the last two years of CPC. Across all deep-dive practices, there was little or no evidence that practices reduced staffing. Also, there were no complaints from practices about reductions in the care management fees during site visits or the most recent deep-dive phone interviews. Finally, more than three-quarters of practices reported that care management payments from Medicare were adequate or more than adequate relative to the costs of implementing CPC in the CPC practice surveys for intervention years 2014 through 2016.

---

[100] The four annual impact estimates for outpatient ED visits were jointly significant as well as significantly different from one another at the 10 percent level.

Our implementation analysis points to the possibility that a number of factors directly related to changes instituted by CPC practices helped lower ED use. For instance, when deep-dive practices were asked during site visits whether they thought CPC activities were having any impact on patient outcomes, they frequently noted that several of their efforts were likely reducing ED use.

With respect to implementation findings about lower utilization of inpatient services, deep-dive practices noted that access to a care manager at the practice for high-risk patients improved the quality of care and this was perceived to help reduce hospitalizations. In-depth interviews with high-risk patients and their caregivers confirmed that care management improved the quality of care from their perspective. Patients who reported that they had regular contact with a care manager, and were willing to work with a care manager, said that they primarily received follow-up after hospitalizations, help with the ongoing management of chronic conditions, medication monitoring, navigating the health system and community services, and other forms of assistance (O'Malley et al. 2017b). Also, in the most recent telephone interviews, practice members and system-level leaders shared their perception that hospital and ED follow-up contacts were contributing to lower readmissions and lower ED utilization. Practice members thought that care transitions contributed to improved quality of care by addressing patients' misunderstandings or barriers before they caused health problems, providing clinicians with information to help patients during follow-up office visits, and catching discrepancies in medications following hospital discharge.

Findings from the survey of beneficiaries also suggest that CPC practices provided better follow-up care after hospitalizations and ED visits, which in turn could have led to reductions in later acute care service use. Specifically, beneficiaries in CPC practices were more likely to be contacted by the primary care provider's office within three days of an inpatient discharge and within one week of an ED visit than beneficiaries in the comparison group. Although we did not find any significant improvement in our claims-based measure of follow-up within 14 days of an inpatient discharge, in our patient survey analysis we found that a higher proportion of CPC than comparison practices provided timely follow-up care after hospitalizations and ED visits (estimated differences in the 2016 patient survey were 8 and 10 percentage points for follow-up after ED visits and hospitalizations, respectively). This suggests that CPC practices provided more non-visit-based follow-up (by phone, for example), as well as follow-up by care managers, who cannot bill Medicare for such services. It is also consistent with the estimated 2 percent reduction in office-based primary care visits among CPC versus comparison practices during CPC, pointing toward greater reliance on non-visit-based interactions.

Overall, these findings suggest that CPC likely slowed the growth in the use of ED and inpatient services. It may take longer or require stronger incentives for not only practices, but also patients and the other providers they visit, to reduce utilization enough to generate net savings. Chapter 9 in this report seeks to identify the role of specific aspects of practice transformation in improving key outcomes.

This study of the impacts of CPC was unique because it combined significant investments from CMS and other payers through multipayer collaboration and a large number of practices in diverse regions. Like CPC, other primary care CMS demonstrations had mixed findings. The Federally Qualified Health Center (FQHC) demonstration led to some improvements in diabetes care, but was associated with increased Medicare utilization and expenditures (Kahn et al. 2017). Similarly, of the eight states in the Multi-Payer Advanced Primary Care (MAPCP), only one had a favorable impact on hospitalizations, two had an unfavorable effect on emergency department visits and one had a favorable effect on expenditures (Nichols et al. 2017).

Consistent with our CPC results, PCMHs were also associated with reduced ED use in other studies (Guy 2014; Pines 2015; Rosenthal 2016; Rosenthal 2013). More generally, prior studies of diverse primary care transformation interventions have been limited and have yielded mixed results (Nichols et al. 2017; Friedberg et al. 2015; Friedberg et al. 2014; Reid et al. 2010; Gilfillan et al. 2010; Werner et al. 2013; Rosenthal et al. 2013; Kahn et al. 2017; Werner et al. 2014; Heyworth et al. 2014; Jaén et al. 2010; Maeng et al. 2013; Reddy et al. 2015; Reid et al. 2009; Kern et al. 2013). Although three studies operated in multiple markets and served large numbers of practices or clinics (Kahn et al. 2017; Werner et al. 2014; Nichols et al. 2017), most published studies examined pilots conducted in single markets (Friedberg et al. 2015; Friedberg et al. 2014; Reid et al. 2010; Gilfillan et al. 2010; Werner et al. 2013; Rosenthal et al. 2013), with small numbers of practices (Reid et al. 2010; Gilfillan et al. 2010; Werner et al. 2013; Rosenthal et al. 2013), or with one or a few payers (Friedberg et al. 2015; Gilfillan et al. 2010; Werner et al. 2013; Rosenthal et al. 2013; Kahn et al. 2017; Werner et al. 2014), or did not examine expenditures (Friedberg et al. 2015; Rosenthal et al. 2013; Werner et al. 2014).

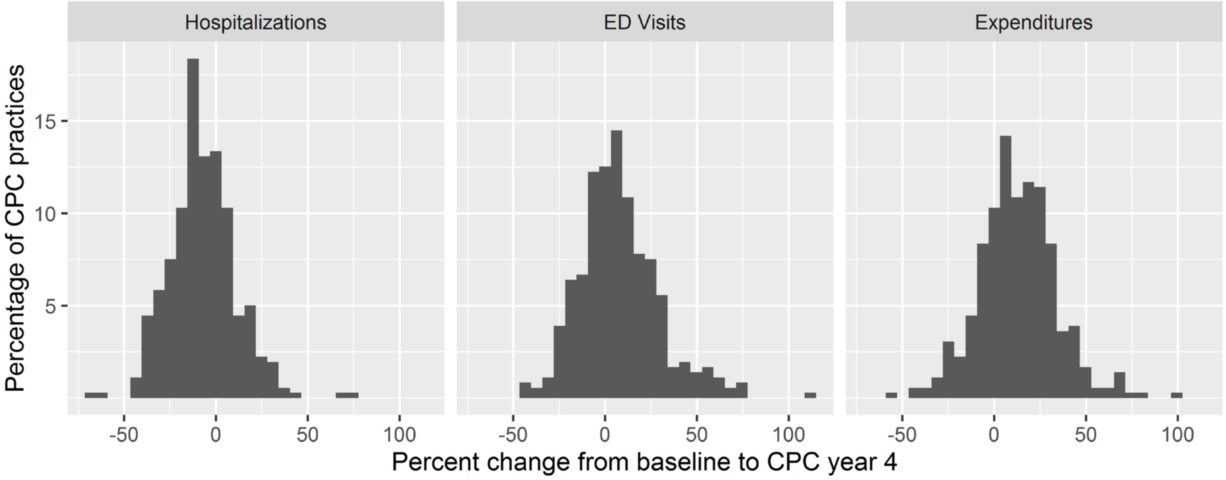
The impact analysis has several limitations. First, participation in CPC was voluntary, and our analysis was limited to Medicare FFS beneficiaries who were attributed to CPC practices. Therefore, the results may not be generalizable to all primary care practices or all patients seen by a practice. However, both the regions and the practices selected were diverse on some features, such as size, patient mix, and ownership, and we compared outcomes for beneficiaries in CPC practices with those of beneficiaries in practices with similar characteristics, patient mix, and prior outcomes. Second, the measures of quality of care that were available in the claims data were limited. (We did not include the eCQMs used for quality improvement and for calculating shared savings, because not all comparison practices reported eCQMs.) Third, although the study used a careful and thorough method to match CPC practices to comparison practices on observed characteristics, there could still be differences in unobserved characteristics between the two groups of practices before CPC began (or differential changes over time in such characteristics) that led to differences in outcomes (in either direction) that were not caused by CPC.

Although CPC did not significantly reduce Medicare Part A and B expenditures, the evidence from our analysis suggests a high likelihood that the initiative achieved some savings; however, the savings were insufficient to fully offset the care management fees. Also, the pattern of declining year-by-year impacts for Medicare expenditures belied expectations, even if the four annual estimates were not significantly different from one another. However, impacts on key service use measures were consistent with expectations, especially the larger effects on ED visits in the last two years of CPC, and were likely driven by improvements in primary care delivery in CPC practices.

9. WERE PRACTICES' CARE DELIVERY APPROACHES ASSOCIATED WITH IMPROVED EXPENDITURE AND UTILIZATION OUTCOMES?

Linking practices' care delivery approaches to the health care expenditures and utilization of their beneficiaries is critical to developing a thorough understanding of how CPC affects outcomes. Chapter 5 of this report details the substantial changes CPC practices made in how they deliver care. Chapter 8 provides impact estimates, by comparing outcomes of CPC and comparison practices, indicating that CPC overall yielded modest reductions in emergency department (ED) visits and hospital stays that reduced Medicare expenditures slightly but not enough to cover the care management fees. Although CPC had limited impacts on key outcomes of utilization or expenditures across all practices, many individual CPC practices improved outcomes over the life of the study (Figure 9.1). Depending on the outcome, 25 to 68 percent of practices experienced some reduction during this period, with the top 10 percent of practices experiencing 24 to 37 percent reductions, on average.

Figure 9.1. Distribution of changes in outcomes among CPC practices between the year before CPC (baseline) and Year 4



In this chapter, we examine whether patients in practices with stronger self-ratings on particular care delivery approaches have better outcomes. Specifically, we estimate the extent to which better performance on service use and expenditures among CPC practices was associated with three measures of primary care delivery approaches during CPC, particularly in Year 4. The analysis builds on findings from related analyses in the past two annual reports (see Peikes et al. 2016a, 2016b). It does not attempt to link outcome changes to factors that may have led practices to implement these approaches more comprehensively, such as the amount of care management fees the practice received, measures of the strength of the practice's leadership, or other aspects of practice culture. But the findings may be helpful in implementing future primary care efforts, like CPC+.

9.1. Key takeaways

Overall, associations between key care delivery approaches reported by practices and better outcomes in Year 4 were few and relatively small in magnitude. The strongest association was between primary care follow-up after acute care episodes and fewer hospitalizations, which was statistically significant overall and larger for high-risk beneficiaries and practices with higher baseline hospitalizations. Continuity of care was also associated with one better outcome (fewer outpatient ED visits) but only for high-risk beneficiaries. After-hours access was related to fewer hospitalizations, but only for practices that reported the highest possible rating on clinical involvement of nonphysicians.

In interpreting these results, it is important to remember that we cannot conclude that a statistically significant association between a care delivery approach and an improved outcome implies that the better outcome is necessarily due to the care delivery approach. However, we did control for other factors using regression models, so the findings are potentially valuable areas to explore further. In deciding which beneficiary-level estimates suggest promising associations between care delivery approaches and outcomes, we focus on those that are statistically significant at the 0.10 level, which also tend to be the largest in magnitude. Furthermore, we place the most credence in those estimates that are either (1) statistically significant at the 0.05 or 0.01 levels, given the many tests being conducted, or (2) consistent with the findings from the practice-level analysis, or both. We also devote little attention to the few estimates that are statistically significant but show outcomes are worse for practices with higher ratings on a care delivery item, because our focus here is on identifying associations between care delivery features and improved outcomes.

We found that for Year 4 outcomes:

- With one exception, the three key care delivery approaches examined here were not strongly associated with reduced hospitalizations, ED use, or expenditures for Medicare FFS beneficiaries in Year 4. In the final year of CPC, practices that reported more consistency in timely primary care follow-up after a hospitalization or ED visit (which we refer to as follow-up after acute care) had lower hospitalization rates. However, practices reporting better access to their clinicians after normal business hours (which we refer to as after-hours access) and patients usually seeing their own provider or practice team (which we refer to as continuity of care) were not consistently associated with outcomes. These findings reflect, in part, the limited variation in the care delivery measures by Year 4 as nearly three-fourths of CPC practices rated themselves at the high end (scores of 10 to 12) of the 12-point scales on these measures.
- Higher self-rating on follow-up after acute care was more strongly associated with fewer hospitalizations among high-risk beneficiaries (such as those with hierarchical condition category [HCC] scores in the 90th percentile in Year 3) than among beneficiaries with average risk, and for practices with high (75th percentile) rather than median baseline hospitalization rates.
- Higher self-rating on continuity of care was associated with fewer outpatient ED visits, but only for high-risk beneficiaries.

- Higher self-rating on after-hours access was associated with fewer hospitalizations, but only for practices that reported the highest rating on involvement of nonphysicians in clinical care.

Several reasons may account for the limited evidence of cross-sectional associations between specific care delivery approaches and better outcomes in Year 4:

1. Transformation is complex; many paths lead to improved outcomes, and the time period between when practices improve and when patient outcomes improve is unknown. Both factors can be challenging to unravel, and theory and literature offer little guidance.
2. To measure transformation to capture links to outcomes, we used the Modified Patient-Centered Medical Home Assessment (M-PCMH-A), which was not designed for this purpose. Thus, transformations in care delivery that are related to expenditures and service use may not have been measured comprehensively or accurately.
3. The clustering of practices at the upper end of the care delivery measures by Year 4 resulted in little variation in these measures, making it difficult to identify associations.

Identifying the most effective care delivery approaches to achieving the goals of lower Medicare expenditures and improved beneficiary outcomes will continue to be important and challenging. In the remainder of this chapter, we briefly review the findings from the past two years, then turn to the hypotheses, methods, and findings from the current analysis as well as its limitations. We conclude by discussing the challenges of the analysis and how to address them in future work.

9.2. Findings from previous analyses

In Year 2, we conducted a simple analysis, assessing the association between practice transformation and service utilization by regressing (risk-adjusted) practice-level changes between the year before CPC (baseline) and Year 2 (October 2013 through September 2014) in hospitalizations per 1,000 beneficiaries on the change over the same time period in a summary index of 37 M-PCMH-A items reported by practices.[101] Key findings included the following:

- **Improvement in a summary measure of overall care delivery was significantly associated with sizable reductions in hospitalizations**. Each one-point improvement in a practice's score (measured on a 12-point scale) was associated with a 1.2 percent reduction in hospitalizations. Practices that increased their baseline score by the mean amount of 2.4 points therefore had an average decrease in hospitalizations of 5.2 percent, twice the reduction (2.6 percent) observed among practices making no improvement in their overall score. Practices in the top quartile of score improvement increased their score by an average of 4.6 points and had an average reduction in hospitalizations of 7.6 percent—three times larger than that of practices making no improvements in their baseline M-PCMH-A score.

---

[101] Similar to the analyses reported in Chapter 8, Year 3 is October 2014 through September 2015, and Year 4 is October 2015 through September 2016. For the beneficiary-level analysis, we were able to include claims covering the last quarter of CPC in the Year 4 analysis. We annualized Year 4 outcomes to adjust for this additional quarter of data.

- **Improvements in the overall score were associated with declines in hospitalizations only for practices whose baseline hospitalization rate was in the highest one-third of all CPC practices**.
- **Improvements in three of the seven care delivery domains (planned care, care coordination, patient engagement) were significantly associated with reduced hospitalizations**. Improvements in the other care delivery domains that the M-PCMH-A measured (access to care, continuity of care, risk-stratified care management, and data-driven continuous quality improvement) were not associated with changes in hospitalizations.
- **Improvements in individual M-PCMH-A items were significantly associated with reductions in hospitalization for 15 of the 37 items.**[102]

In Year 3, we found different results—the association between practices' hospitalization rate and the changes in the summary index of care delivery between baseline and Year 3 was no longer sizable or statistically significant. Further, the association between changes in the hospitalization rate (and other outcomes) and changes in individual M-PCMH-A items was statistically significant for only a few items and outcomes, and some of these significant associations were favorable while others were unfavorable. The change in results appeared to be due to (1) relatively unstable hospitalization rates for individual practices between Year 2 and Year 3, and (2) a narrowing of the differences among practices' care delivery approaches. By Year 3, most practices gave themselves relatively high rankings on the M-PCMH-A items. This reduction in the range of M-PCMH-A item scores led to few meaningful relationships between care delivery measures and key outcomes in our sample of CPC practices. In addition, the data did not support our hypothesis that the link between better care delivery scores and fewer hospitalizations was weaker for hospital-owned practices, which we hypothesized might be true, given different incentives.[103]

9.3. Approach to Year 4 analysis

This evolving relationship of care delivery approaches with hospitalizations, ED use, and expenditures led us to focus this report on individual M-PCMH-A items that best reflect three primary care delivery approaches that the primary care and medical home literatures identify as important for reducing these outcomes. After-hours access to care, continuity of care, and follow-up after acute care have been shown to be strong predictors of service utilization and expenditures.[104] Specifically,

---

[102] Given the high degree of collinearity among the individual items, we estimated the relationship between each item and risk-adjusted hospitalization rate separately.

[103] The current analysis yielded the same result; hospital ownership has no bearing on associations between practices' care delivery approaches and outcomes.

[104] See Starfield 1998, 2005; Institute of Medicine 1996; World Health Organization 1978; Bindman et al. 1995; Shi 1994; Shi et al. 2005; Franks and Fiscella 1998; Kringos et al. 2012; Fisher et al. 2003a, 2003b; Phillips and Bazemore 2010; Macinko et al. 2007; and O'Malley et al. 2015. We do not include a fourth approach cited in some of these studies, comprehensiveness of care, because our M-PCMH-A instrument did not measure it.

- Access to after-hours care coordinated with the patient's primary care provider has been associated with lower rates of hospitalizations and ED use, greater patient satisfaction, and fewer unmet medical needs in some patient populations.[105]
- Continuity with the same clinician and practice team over time has been associated with lower hospitalization rates,[106] lower ED visits,[107] lower total expenditures,[108] and lower episode-based expenditures for chronic conditions.[109]
- An evaluation of 15 randomized trials of care coordination initiatives found that success in reducing hospitalizations and expenditures was limited to high-risk patients and programs that had a strong transitional care component, substantial in-person contact, and aggressive medication management.[110] Similarly, having systematic arrangements to coordinate care between the primary care practice and the hospital about ED visits and hospitalizations has been associated with reduced ED use and lower readmission rates, particularly for older patients with chronic conditions.[111]

CPC practices might not have made each of these measures of care delivery a primary focus during the initiative. Each year, practices had to implement changes to meet defined Milestones, but within the Milestones practices had some leeway to choose their focus. In addition to examining the associations between our outcomes and approaches to care delivery, we examined whether the associations were enhanced by having nonphysician practice staff engage in clinical tasks, enabling them to work to the “top of their licenses”—that is, by practicing to the full extent of their education and training (as hypothesized by Bodenheimer and Laing 2007; Bodenheimer 2007).

The following M-PCMH-A items best capture (1) the key care delivery approaches that are expected to be associated with lower unnecessary service use, and (2) clinical involvement of nonphysicians, the potential modifier of these associations (also see Table 9.1):

- **Continuity**—extent to which patients are usually seeing their own provider and practice team
- **After-hours access**—extent to which patients have after-hours access to a practice staff member with patient-specific data

---

[105] See Jerant et al. 2012; Grol et al. 2006; O’Malley 2013; and Zickafoose et al. 2013.

[106] See Mainous and Gill 1998; Cabana and Jee 2004; Weiss and Blustein 1996; Hussey et al. 2014; and Nyweide et al. 2013.

[107] See Rosenblatt et al. 2000; and Gill et al. 2000.

[108] See Cabana and Jee 2004 and De Maeseneer et al. 2003.

[109] See Weiss and Blustein 1996; Hussey et al. 2014; Raddish et al. 1999; and Ettner 1999.

[110] See Peikes et al. 2009.

[111] See Le Berre et al. 2017 and Coleman et al. 2006. We also note that the care delivery measures used in this chapter are not the only ones that could affect service use and expenditures. We selected these three measures because they are the ones most consistently found to be associated with improvements in these outcomes.

- **Follow-up after acute care**—extent to which the practice identifies and follows up with patients seen in the ED or hospital
- **Clinical involvement of nonphysicians**—extent to which nonphysician staff perform clinical service roles

We further refined our approach by using beneficiary-level, rather than practice-level, data on outcomes to estimate the relationships between care delivery and outcomes. This change allowed us to control more accurately for beneficiary risk by using individual HCC scores from the previous year to predict a given year's outcomes, and to investigate whether outcomes were more responsive to better care delivery for high-risk beneficiaries.

The analysis in the remainder of this chapter tests the following hypotheses:

1. Improvements between baseline and a given year in practices' reported continuity of care, after-hours access, and follow-up after acute care are associated with a decrease in hospitalizations and outpatient ED visits, and lower expenditures, for their beneficiaries over the same time period.
2. Higher levels of practices' reported continuity of care, after-hours access, and follow-up after acute care in a year are associated with fewer hospitalizations and outpatient ED visits, and lower expenditures, for their beneficiaries in that year.
   - These relationships are stronger for practices with higher baseline values of the outcome measures, for high-risk beneficiaries, and for practices with higher clinical involvement of nonphysicians.

9.4. Data and methods

We conducted these analyses using data on hospitalizations, ED use, and expenditures at both the practice and beneficiary levels. First, using practice-level data, for Years 2, 3, and 4, we assessed the association of practices' *changes* in outcomes since the beginning of CPC to *changes* in continuity, after-hours access, and follow-up after acute care, drawn from the M-PCMH-A in the practice survey. Second, using beneficiary-level claims data, we examined cross-sectional associations of outcomes in a given year to levels of these care delivery approaches in the same year, controlling for the practices' average baseline outcome and beneficiaries' HCC scores in the prior year. Using beneficiary data, we also assessed whether associations were stronger for high-risk beneficiaries, for practices that had more outpatient ED visits, hospitalization, and expenditures in the baseline period, or when nonphysician staff were used more extensively to provide clinical services, which may include care management and other services. Below we describe the samples, data sources, measures, and regression models used to examine the association between care delivery approaches and outcomes.

Sample. For the practice-level analysis, we used the three-quarters of CPC practices (N = 359) with the largest number of attributed Medicare FFS beneficiaries. Similar to previous years' analyses, we excluded the smallest 25 percent of practices (those with fewer than 330 attributed beneficiaries), because outcome estimates based on small numbers of beneficiaries are highly variable.

For the beneficiary-level analysis, we used three samples of beneficiaries, for CPC Years 2, 3, and 4, respectively. The sample in each year consisted of beneficiaries attributed to the 359 practices at any time during the year, including those who died partway through the year.

Data sources. We analyzed data from several sources:

- We used Medicare fee-for-service (FFS) claims data to construct the three key outcome measures for the beneficiary- and practice-level analyses: (1) hospitalizations, (2) outpatient ED visits, and (3) Medicare FFS expenditures.
- We used several data sources to construct control variables for beneficiary characteristics (CMS's Enrollment Database file, HCC scores), practice characteristics (SK&A, National Committee for Quality Assurance), and market characteristics (Hospital Referral Region (HRR)-level spending and utilization data, Area Resource File, and Health Resources & Services Administration).
- We used four rounds of the modified version of the PCMH-A module of the CPC practice survey fielded in (1) October–December 2012, (2) April–July 2014, (3) April–August 2015, and (4) April–August 2016, which correspond to baseline, Year 2, Year 3, and Year 4 of CPC, respectively, for data on primary care delivery approaches reported by CPC practices.

Outcomes. We examined the following outcomes:

- Beneficiary-level outcomes include the beneficiaries' average monthly Medicare FFS expenditures, annualized hospitalizations, and annualized outpatient ED visits, for Years 2, 3, and 4.[112]
- Practice-level outcomes include changes in average per beneficiary per month Medicare FFS expenditures, average number of hospitalizations per 1,000 beneficiaries per year, and average number of outpatient ED visits per 1,000 beneficiaries per year, between baseline and Years 2, 3, and 4, respectively.

Key explanatory variables. The data on key primary care delivery approaches—continuity of care, after-hours access to care, and follow-up after acute care, as well as the potential modifier of their associations with outcomes (clinical involvement of nonphysicians)—come from four items of the modified PCMH-A module of the practice survey. We measured each item on a 1 to 12 scale spanning four response categories, with higher numbers corresponding to more advanced levels of care (see Table 9.1).

---

[112] We do not include Year 1 in the analysis, because outcome measurement should follow measurement of explanatory variables, not precede it, and Year 1 ended six months before the Round 2 practice survey. In place of Year 1, we use Year 2 as the first year for which we explain outcomes using explanatory variables from Round 2 practice survey.

Table 9.1. Key primary care delivery approaches from the M-PCMH-A

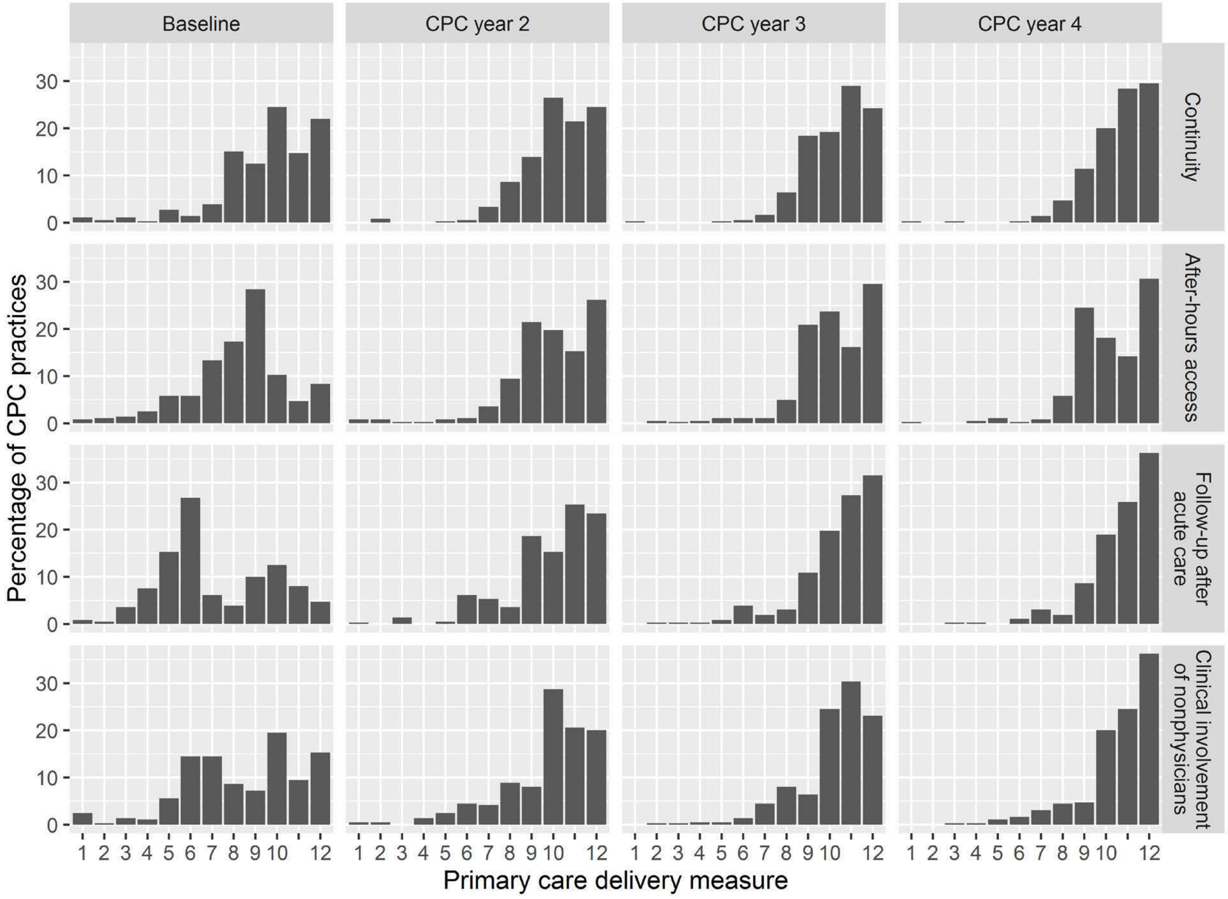
CONTINUITY **Patients are encouraged to see their paneled provider and practice team** ☐ **Check here if patients are not assigned to specific provider panels.**	…only at the patient's request. 1 2 3	…by the practice team, but it is not a priority in appointment scheduling. 4 5 6	…by the practice team and it is a priority in appointment scheduling, but patients commonly see other providers because of limited availability or other issues. 7 8 9	…by the practice team and it is a priority in appointment scheduling, and patients usually see their own provider or practice team. 10 11 12
AFTER-HOURS ACCESS **Patient after-hours access (24 hours, 7 days a week) to a physician, PA/NP, or nurse**	...is not available or limited to an answering machine. 1 2 3	…is available from a coverage arrangement (e.g., answering service) that does not offer a standardized communication protocol back to the practice for urgent problems. 4 5 6	…is provided by a coverage arrangement (e.g., answering service) that shares necessary patient data with and provides a summary to the practice. 7 8 9	…is available via the patient's choice of email or phone directly with the practice team or a provider who has real-time access to the patient's electronic medical record. 10 11 12
FOLLOW-UP AFTER ACUTE CARE **Follow-up by the primary care practice with patients seen in the Emergency Room (ER) or hospital**	...generally does not occur because the information is not available to the primary care team. 1 2 3	…occurs only if the ER or hospital alerts the primary care practice. 4 5 6	…occurs because the primary care practice makes proactive efforts to identify patients. 7 8 9	…is done routinely because the primary care practice has arrangements in place with the ER and hospital to both track these patients and ensure that follow-up is completed within a few days. 10 11 12
CLINICAL INVOLVEMENT OF NON-PHYSICIANS **Non-physician practice team members**	…play a limited role in providing clinical care. 1 2 3	…are primarily tasked with managing patient flow and triage. 4 5 6	…provide some clinical services such as assessment or self-management support. 7 8 9	…perform key clinical service roles that match their abilities and credentials. 10 11 12

As we describe in Chapter 5, CPC practices reported improvement over time on these measures, as shown by the increase in average scores across practices over time (Table 9.2). However, the bulk of the improvement over time occurred between baseline and Year 2. This pattern is also depicted in Figure 9.2, which indicates that the distribution of scores was fairly uniform at baseline, increased strongly by Year 2, and continued to increase gradually during Years 3 and 4 of CPC (shifting to the right) as more practices improved their scores and began reporting the maximum value for these measures.

Table 9.2. Mean scores (out of a maximum of 12) by year of key primary care delivery approaches

	Baseline	Year 2	Year 3	Year 4
Continuity of care	9.6	10.2	10.4	10.6
After-hours access to care	8.2	9.9	10.2	10.3
Follow-up after acute care	7.2	9.9	10.4	10.7
Clinical involvement of nonphysicians	8.5	9.7	10.2	10.6

Figure 9.2. Distribution of scores by year for key primary care delivery approaches



Other explanatory variables. We accounted for several beneficiary, practice, and region (or market) characteristics to control for factors other than the practice's approach to delivering primary care that could affect outcomes. We measured all characteristics except for HCC score at baseline; we measured HCC score in the year prior to the year of outcome measurement. These characteristics are:

- **Region (or market) characteristics**—Medicare Advantage penetration rate; median household income; percentage urban; whether in a medically underserved area; HRR-level expenditures, hospitalizations, or outpatient ED visits (depending on outcome)
- **Practice characteristics**—number of physicians, whether the practice is hospital-owned, and whether the practice is multi-specialty
- **Practice's average outcome at baseline**—baseline values of average per beneficiary per month Medicare FFS expenditures, average number of hospitalizations per 1,000 beneficiaries per year, and average number of outpatient ED visits per 1,000 beneficiaries per year
- **Beneficiary characteristics**—age, gender, race/ethnicity, HCC score, whether dually eligible for Medicare and Medicaid, original reason for Medicare (age, disability, other)

Regression models. In addition to estimating practice-level models as we have done in previous years' analyses, we estimated beneficiary-level models to better account for individual beneficiaries' risk of needing hospitalizations or ED care and incurring high expenditures using prior year HCC scores.[113] By measuring risk closer to when the outcome is measured, we hoped to capture the relationship of interest for beneficiaries who were most at risk during this period. For both models, we used ordinary least squares regression to examine hospitalizations, outpatient ED visits, and expenditures as a function of continuity, after-hours access, and follow-up after acute care, controlling for beneficiary, practice, and market characteristics. Because the cross-sectional relationships examined in beneficiary-level models could be driven by differences in outcomes and unmeasured differences in practice styles that existed before CPC and generated these outcomes, we also controlled for the practice's average outcome at baseline in these models. For beneficiary-level outcomes, we estimated additional models to examine whether associations between care delivery approaches and the outcome of interest in a year were stronger among beneficiaries with higher HCC scores in the year immediately preceding the outcome period, and among those in practices with higher baseline outcomes and better clinical involvement of nonphysicians, respectively. Beneficiary-level observations are weighted so that the results represent each practice equally, to ensure that large practices do not dominate them.

In interpreting these results, it is important to remember that the estimated relationships are only partial correlations and may not be due to causal effects. That is, although the estimated relationships control for the influence of other factors, we cannot conclude that an observed

---

[113] We also account for beneficiary risk in the practice analysis by controlling for average HCC scores, but beneficiary-level analysis allows us to control for individual HCC scores and potentially avoid an aggregation bias.

association between a care delivery approach and an improved outcome implies that the better outcome is attributable wholly or partly to the care delivery measure.

9.5. Practice-level model results

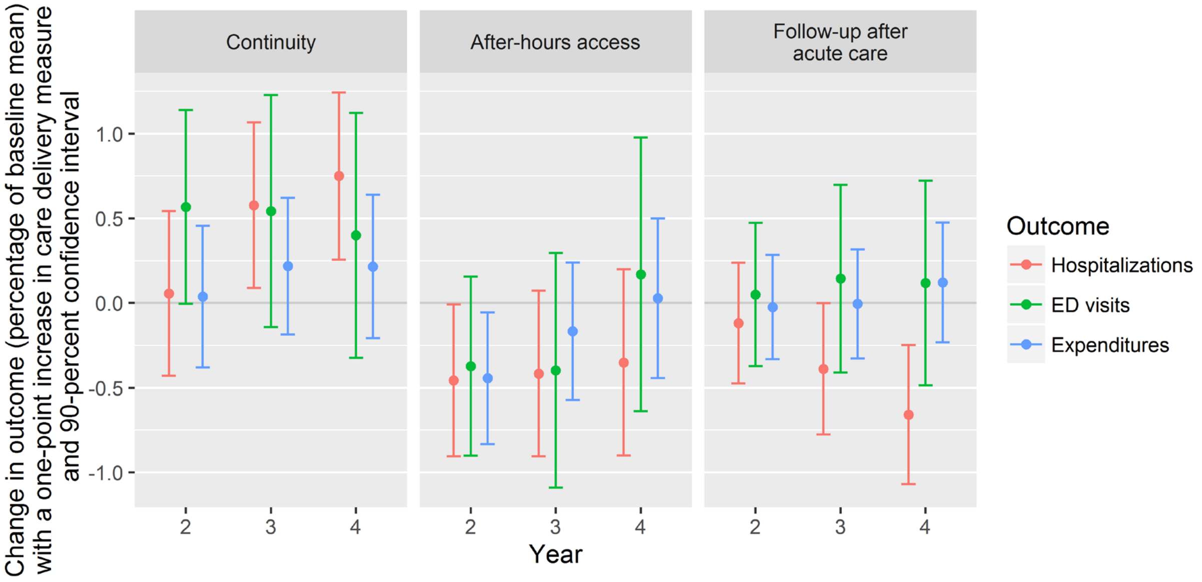
The practice-level models examine whether the change in average outcome (hospitalizations, outpatient ED visits, and Medicare expenditure) from baseline to Years 2, 3, and 4, respectively, for attributed Medicare beneficiaries in a practice was related to the change in scores of the three care delivery approaches reported by practices (continuity of care, after-hours access, and follow-up after acute care) over the same period, controlling for the practice's average outcome at baseline. Figure 9.3 shows the predicted percentage change in the outcome (compared with the baseline mean[114]) for a one-point increase in each care delivery approach measure, holding the other two measures constant. In other words, the estimates reflect the predicted difference in outcomes between a practice that reported (say) an 11 out of 12 compared to a practice that reported a 10 out of 12, with negative values indicating lower service use or expenditures.

For Years 2, 3, and 4, associations of changes in outcomes since baseline with improvements in each of the three key care delivery approaches over the same time period were small, around 0.5 percent of the practice's average outcome at baseline. Improvement in follow-up after acute care between baseline and Year 4 was significantly associated with lower hospitalization rates in Year 4. However, improvements in follow-up after acute care were only marginally related to lower hospitalizations in Year 3 and not significantly related to hospitalizations in Year 2, or to outpatient ED visits or expenditures in any year. Similarly, we found little or no association between improvements in the other two care delivery approaches and better outcomes in any year. In fact, improvements in the practice-reported continuity measure appear to be associated with an *increase* in hospitalizations in Years 3 and 4 ($p = 0.053$ and 0.013, respectively). This isolated and anomalous result appears to be a chance association, given that we did not find a similarly significant association using beneficiary-level data, as shown in the next section.

---

[114] The baseline means are 449 ED visits, $732 per beneficiary per month, and 307 hospitalizations.

Figure 9.3. Associations of improvements in continuity, after-hours access, and follow-up after acute care with changes in practice-level service use and expenditures in Years 2, 3, and 4



We used beneficiary-level data on outcomes so we could control for beneficiary risk level in estimating cross-sectional relationships between the care delivery approaches and outcomes. Additionally, we examined whether these relationships were stronger for beneficiaries in practices with high hospitalizations, ED visits, and expenditures at baseline (in other words, practices with greater scope for improvement) and greater clinical involvement of nonphysicians. We present these findings below.

9.6. Beneficiary-level model results

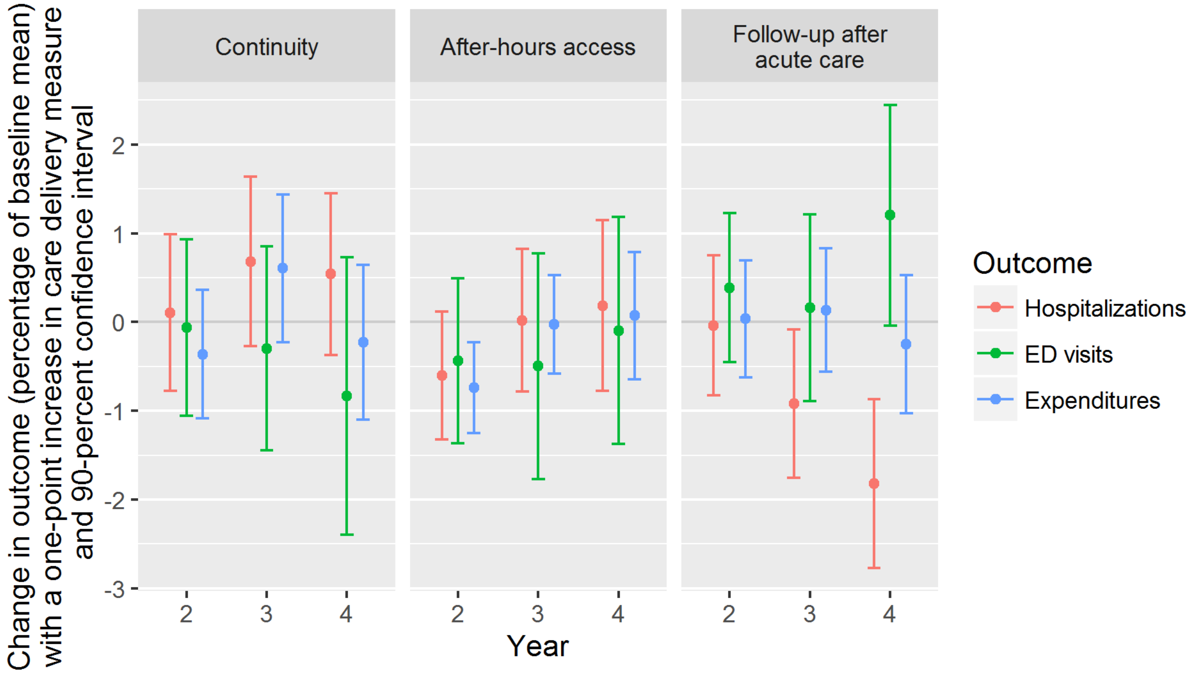
In Year 4, better follow-up after acute care was associated with fewer hospitalizations. The relationship was strongest among high-risk beneficiaries and in practices with higher baseline hospitalizations. Greater continuity of care was associated with fewer ED visits, but only for high-risk beneficiaries. After-hours access was related to fewer hospitalizations, but only when clinical involvement of nonphysicians was at its maximum value.

Contrary to the above analyses, which used practice-level data, here we used beneficiary-level data on outcomes and beneficiary risk, controlling for beneficiary, practice, and market characteristics, to assess the cross-sectional association between beneficiary outcomes and practices' care delivery approaches. The analysis also differed from analyses in previous reports by estimating the relationship between *levels* of care delivery measures and outcomes, rather than relating *changes* in individual and summary measures of primary care delivery approaches to changes in aggregate outcomes at the practice level. We used levels because changes in outcomes at the beneficiary level are likely to be highly variable and harder to predict than changes in outcomes at the practice level.

9.6.1. Overview of results for Years 2, 3, and 4

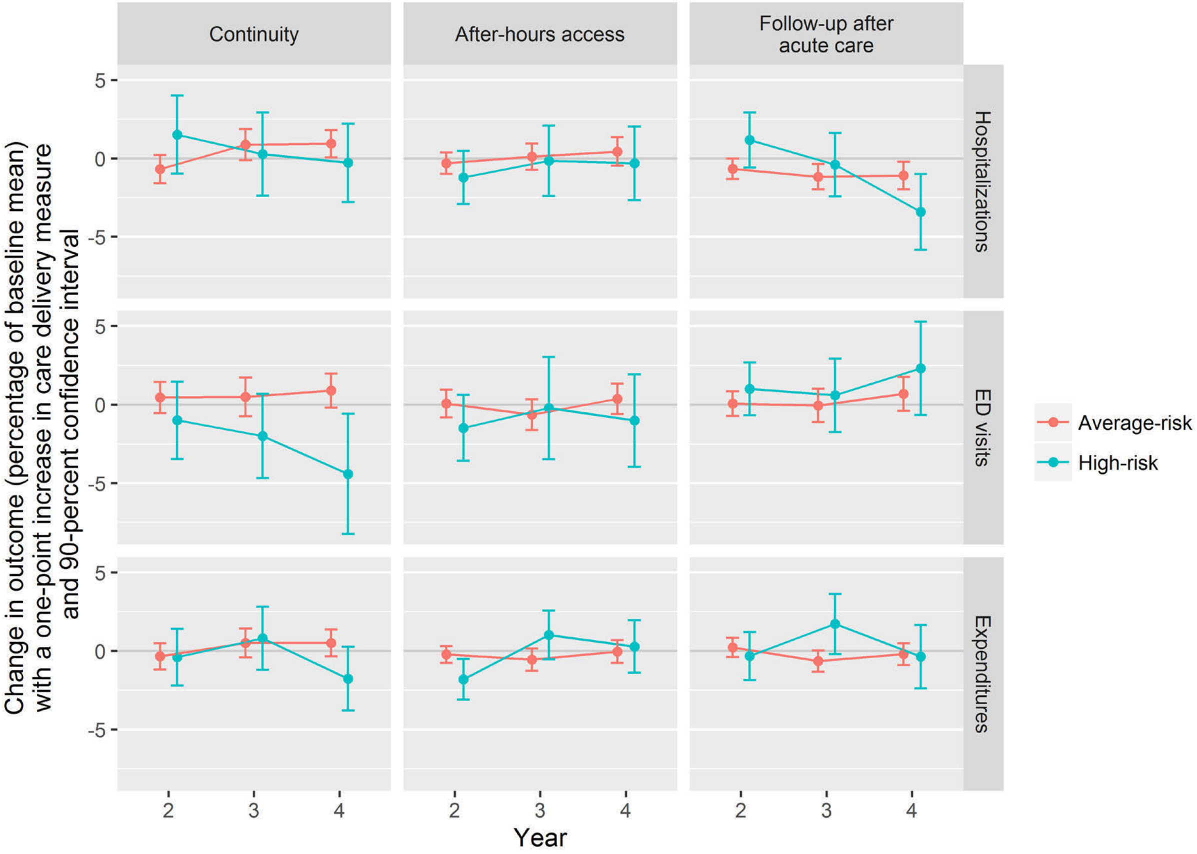
We found little evidence of associations between the three primary care delivery approaches and favorable beneficiary outcomes (negative values in the figures) across Years 2, 3, and 4, and year-to-year patterns were erratic (Figures 9.4 to 9.6). The exception is follow-up after acute care, which was more strongly related to fewer hospitalizations with each year (point estimates below the zero line indicate favorable associations between outcomes and care delivery approaches), becoming statistically significantly different from zero in Years 3 and 4. Continuity tended to be more strongly associated with fewer outpatient ED visits toward the end of CPC, but the relationships were weak and not significantly different from zero. Associations of care delivery approaches with expenditures indicate no clear pattern across the years and were not significantly different from zero.

Figure 9.4. Associations between primary care delivery approaches and outcomes for Years 2, 3, and 4



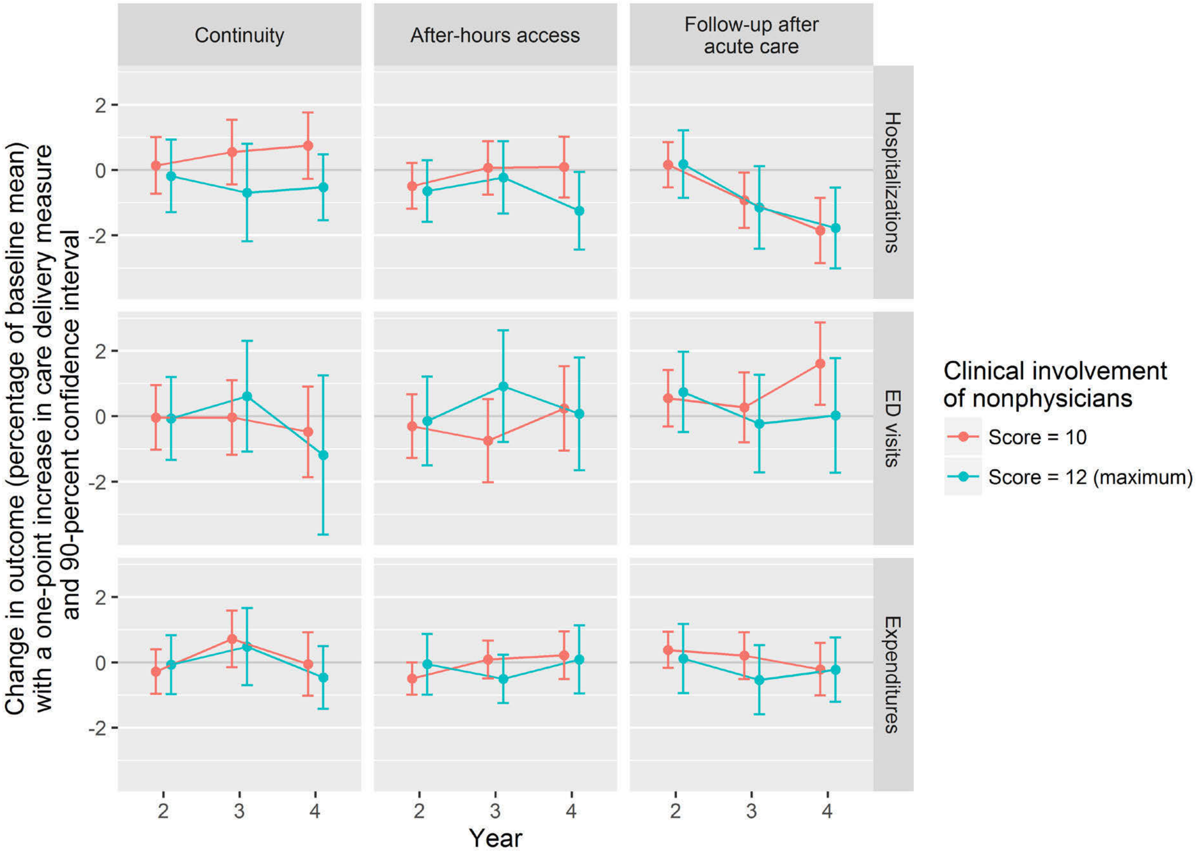
Overall results, by beneficiary risk-level. Follow-up after acute care was associated with fewer hospitalizations in Year 4 for both average- and high-risk beneficiaries but to a greater extent for high-risk beneficiaries (Figure 9.5). Similarly, for high-risk beneficiaries, continuity was more strongly related to fewer outpatient ED visits in each year, but it was significantly different from zero only in Year 4. Other associations between care delivery approaches and outcomes were weak and not significantly different from zero.

Figure 9.5. Predicted associations between primary care delivery approaches and outcomes, at average-risk and high-risk HCC values for Years 2, 3, and 4



Modifying effects of greater clinical involvement of nonclinician staff. Although after-hours access was not significantly related to hospitalizations among all beneficiaries in Year 4, beneficiaries in practices with maximum clinical involvement of nonphysicians had significantly lower hospitalizations (Figure 9.6). These practices comprised more than one-third of the 359 CPC practices included in this analysis. In contrast, follow-up after acute care was significantly related to fewer hospitalizations irrespective of the clinical involvement of nonphysicians. With the exception of these results, small differences in clinical involvement of nonphysicians were not associated with differences in outcomes as both practices with a maximum score (12) and those with a slightly lower score (10) had associations between their care delivery scores and outcomes that were not significant.

Figure 9.6. Predicted associations between key primary care delivery approaches and outcomes for practices with 25th percentile (10) and maximum (12) levels of clinical involvement of nonphysicians for Years 2, 3, and 4



The beneficiary-level cross-sectional analyses show that Year 4 had the most promising evidence for the associations between primary care delivery approaches and favorable outcomes. Hence the remainder of this section describes Year 4 findings in more detail.

9.6.2. Results for CPC Year 4

By Year 4, nearly three-quarters of practices in this analysis were reporting advanced levels of care (in the top response category with scores of 10–12) for the care delivery approaches examined in this chapter: continuity, after-hours access, and follow-up after acute care, as well as clinical involvement of nonphysicians, the potential modifier of these approaches (Table 9.3). Although the range in scores was smaller than that observed at baseline (when the distribution was more uniform), Table 9.1 shows substantial variation within the top response category (10–12). The wording and layout of the 1–12 scores in Table 9.1 suggest how this variation can occur. For example, in the case of the top response category for continuity—which indicates that the practice team encourages patients to see their paneled provider and practice team, it is a priority in appointment scheduling, and patients usually see their own provider or practice team—some practices may select 10 because they make continuity a priority some of the time, and for someone responding 10 versus 12, the extent to which he or she "usually" sees his or her own provider may vary.

Table 9.3. Variation of key primary care delivery approaches across CPC practices in Year 4

Primary care delivery approach	Mean	25th percentile	Median	75th percentile
Continuity	10.6	10	11	12
After-hours access	10.3	9	10	12
Follow-up after acute care	10.7	10	11	12
Clinical involvement of nonphysicians	10.6	10	11	12

Despite limited variation in these measures across practices, in Year 4, beneficiaries in practices that scored higher on follow-up after acute care had significantly fewer hospitalizations ($p = 0.002$) than those in lower scoring practices, controlling for their practice's average baseline hospitalizations (Table 9.4). A one-point increase in score was associated with 6 fewer hospitalizations per 1,000 beneficiaries per year (about 2 percent of the baseline mean of 307 hospitalizations per 1,000 beneficiaries per year). This association is larger than the largest association found in earlier years, where a one-point improvement in the overall M-PCMH-A score was associated with a 1.15 percent decline in a practice's own hospitalization rate between baseline and Year 2. Relationships of all outcomes with the other two care delivery measures in Table 9.4 were substantially smaller or essentially zero and not statistically significant.

In previous reports, we found that associations between practice transformation and improvement in outcomes during CPC were concentrated among practices with the largest scope for improvement—that is, practices with high utilization before CPC began (at baseline). To test whether this association existed in the Year 4 cross-sectional data, we included in the model an interaction of the care delivery measure and practice's baseline outcome. Table 9.4 (lower panels) contrasts the change in outcome for a one-point increase in the care delivery approach for a practice with median baseline outcome versus a practice with a baseline outcome at the 75th percentile.

Table 9.4. Associations of key primary care delivery approaches with annual per beneficiary outcomes in Year 4

Dependent variable	Hospitalizations per 1,000 beneficiaries (mean = 307)	Outpatient ED visits per 1,000 beneficiaries (mean = 449)	Average monthly Medicare expenditures per beneficiary (mean = $732)
Change in outcome with a one-point increase in:			
Continuity	1.66 (0.33)	-3.74 (0.38)	-1.66 (0.67)
After-hours access	0.569 (0.75)	-0.429 (0.90)	0.531 (0.87)
Follow-up after acute care	**-5.58** **(0.002)**	5.40 (0.11)	-1.85 (0.60)
Change in outcome with a one-point increase in continuity for a:			
…practice with baseline outcome at median	0.708 (0.70)	-2.41 (0.49)	-2.33 (0.55)
…practice with baseline outcome at 75th percentile	2.86 (0.12)	-4.98 (0.16)	1.31 (0.80)
Change in outcome with a one-point increase in after-hours access for a:			
…practice with baseline outcome at median	-0.57 (0.65)	-0.42 (0.91)	-0.0310 (0.99)
…practice with baseline outcome at 75th percentile	*3.07* *(0.07)*	-1.21 (0.75)	0.977 (0.77)
Change in outcome with a one-point increase in follow-up after acute care for a:			
…practice with baseline outcome at median	**-5.45** **(0.005)**	*5.98* *(0.09)*	-1.65 (0.63)
…practice with baseline outcome at 75th percentile	**-9.42** **(<0.0001)**	3.20 (0.37)	-5.69 (0.22)

Note: Beneficiary level analysis for N = 354,405 beneficiaries in 359 practices. *P*-values are shown in parentheses. Shading indicates statistical significance at the 0.10 level. **Red shading** *with italicized white text* signifies that our estimate was statistically significant and showed an increase in the service use or expenditures outcome; **green shading with bolded text** signifies that an estimate was statistically significant and implied a reduction in the service use or expenditures outcome. Regressions control for beneficiary, practice, market characteristics, and practice's baseline outcome. We examine individual beneficiary-level data but report estimated associations for hospitalizations and outpatient ED visits per 1,000 beneficiaries for ease of interpretation.

The favorable overall relationship noted above between better follow-up after acute care and fewer hospitalizations was even stronger for beneficiaries in practices with high baseline hospitalization rates. Although the association was statistically significant for beneficiaries in a practice with median hospitalizations at baseline, it was nearly twice as large for practices with baseline hospitalizations at the 75th percentile. For these high-baseline practices, a one-point increase in follow-up was associated with a 3 percent reduction (relative to the overall baseline mean of 307) in hospitalizations in Year 4.

We also found two anomalous, statistically significant associations in Table 9.4 that show an outcome worsening with higher scores on a care delivery measure. It is possible that better after-hours access and closer follow-up after acute care did increase short-term acute care use if these processes identified potentially important problems. However, we feel these findings are more likely due to chance than to a perverse true association between better care delivery and worse outcomes. Further, given that our focus is solely on identifying care delivery features that are associated with improvements in outcomes, we do not attempt to explain these unanticipated results.[115]

High-risk subgroup. To estimate how the associations between care delivery measures and outcomes change with individual beneficiaries' prospective risk of incurring high Medicare expenditures, we included in our basic regression model an interaction of each of our three care delivery measures with the beneficiary's HCC score from the previous year (Year 3). This analysis refined the previous analyses from Years 2 and 3 by using beneficiary-level data and using their HCC scores from Year 3 rather than from baseline, to capture associations for beneficiaries with high post-baseline risk of needing costly services.

We found that greater continuity was related to fewer outpatient ED visits for high-risk beneficiaries (as illustrated in Table 9.5 for those with HCC scores one point above the average, or about twice the mean HCC score), but not for those with average risk (those with mean HCC scores). For beneficiaries with HCC scores that were one point above the average (which places them at the 90th percentile of the HCC score distribution), a one-point increase in continuity was significantly associated with a more than 4 percent decline in outpatient ED visits (compared with the baseline mean for all beneficiaries). A similarly larger association existed between continuity and lower expenditures among high-risk beneficiaries compared with average-risk beneficiaries, but it was not significantly different from zero.

---

[115] Our rationale for concluding that these perverse associations are due to chance rather than to a true linkage is that we found hospitalizations and ED use worsening with higher scores on access to care and follow-up after acute care only for subgroups of practices. These associations were much smaller in magnitude (as a percentage of the outcome mean) than the statistically significant favorable associations in Table 9.4, and had larger standard errors and *p*-values. Furthermore, the associations of these outcomes with care delivery in the full sample were small and not statistically significant, and the subgroup relationships were not observed in practice-level regressions (not shown). Thus, we consider these results spurious, and of no interest here, given our focus on identifying care delivery features associated with reduced utilization and expenditures.

Table 9.5. Relationships of key primary care delivery approaches with annual per beneficiary outcomes for high-risk beneficiaries in Year 4

	Coefficients		
Dependent variable	**Hospitalizations per 1,000 beneficiaries (mean = 307)**	**Outpatient ED visits per 1,000 beneficiaries (mean = 449)**	**Average monthly Medicare expenditures per beneficiary (mean = $732)**
Change in outcome with a one-point increase in <u>continuity</u> for a:			
…beneficiary with average HCC score (1.00)	1.65 (0.34)	-3.82 (0.37)	-1.72 (0.66)
…beneficiary with HCC score of one point above average (2.00)	-0.859 (0.85)	**-19.8** **(0.06)**	-12.91 (0.15)
Change in outcome with a one-point increase in <u>after-hours access</u> for a:			
…beneficiary with average HCC score (1.00)	0.590 (0.74)	-0.365 (0.92)	0.51 (0.87)
…beneficiary with HCC score of one point above average (2.00)	-0.969 (0.83)	-4.53 (0.57)	2.08 (0.78)
Change in outcome with a one-point increase in <u>follow-up after acute care</u> for a:			
…beneficiary with average HCC score (1.00)	**-5.70** **(0.002)**	5.52 (0.11)	-1.86 (0.60)
…beneficiary with HCC score of one point above average (2.00)	**-10.50** **(0.02)**	10.40 (0.20)	-2.63 (0.77)

Note: Beneficiary level analysis for N = 354,405 beneficiaries in 359 practices. *P*-values are shown in parentheses. Shading indicates statistical significance at the 0.10 level. **Green shading with bold text** signifies that an estimate was statistically significant and implied a reduction in the service use or expenditures outcome. Regressions control for beneficiary, practice, market characteristics, and practice's baseline outcome. We examine individual beneficiary-level data but report estimated associations for hospitalizations and outpatient ED visits per 1,000 beneficiaries for ease of interpretation.

Similarly, as we note above, we found a stronger relationship between follow-up after acute care and hospitalizations for beneficiaries with higher HCC scores, but for this care delivery measure, it was a matter of magnitude. Follow-up after acute care had a statistically significant relationship with fewer hospitalizations even for beneficiaries with average HCC scores, but the relationship doubled in magnitude for high-risk beneficiaries (HCC scores of one point above the average). Consistent with our overall findings for this care delivery measure, a one-point increase in the follow-up measure was associated with about 2 percent fewer hospitalizations for beneficiaries with average HCC scores and more than 3 percent fewer hospitalizations for beneficiaries with high HCC scores (compared with the baseline means for all beneficiaries). There was no association between follow-up after acute care and outpatient ED visits or expenditures for high-risk beneficiaries.

The associations of better after-hours access to care with outcomes were small for both average- and high-risk beneficiaries and not significantly different from zero.

Role of clinical involvement of nonphysicians in aiding primary care delivery and improving outcomes. We hypothesized that practices that made greater use of nonphysician staff to provide clinical care would be more likely than other practices to see associations between care improvements and improved beneficiary outcomes. To test this hypothesis, we included an interaction of clinical involvement of nonphysicians with each of the three care delivery approaches when examining the associations with Year 4 outcomes.

We found mixed evidence that higher levels of clinical involvement of nonphysicians strengthened the relationship between our three key care delivery measures and outcomes (Table 9.6). After-hours access was significantly related to lower hospitalizations when clinical involvement of nonphysicians was at the 75th percentile (also the maximum) with a one point increase in after-hours access being related to 1 percent fewer hospitalizations. For continuity, the relationship with outcomes was more favorable for practices at the 75th percentile of clinical involvement of nonphysicians than for practices at the 25th percentile. Nonetheless, even for the practices with high clinical involvement of their nonphysician staff, the association of outcomes with continuity was small (a decline of 0.5 to 1 percent in any of the three outcomes for a one-point improvement in continuity) and not significantly different from zero. In contrast to these results, we found that better follow-up after acute care was significantly associated with fewer hospitalizations irrespective of small differences in levels of clinical involvement of nonphysicians. We also found that better follow-up was associated with more outpatient ED visits when clinical involvement of nonphysicians was not at its maximum value (12).

Table 9.6. Variation in the associations between key primary care delivery approaches and annual per beneficiary outcomes with clinical involvement of nonphysicians, Year 4

	Coefficients		
Dependent variable	**Hospitalizations per 1,000 beneficiaries (mean = 307)**	**Outpatient ED visits per 1,000 beneficiaries (mean = 449)**	**Average monthly Medicare expenditures per beneficiary (mean = $732)**
Change in outcome with a one-point increase in continuity in a practice at:			
25th percentile of clinical involvement of nonphysicians (10)	2.30 (0.23)	-2.14 (0.57)	-0.366 (0.93)
75th percentile of clinical involvement of nonphysicians (12)	-1.61 (0.39)	-5.33 (0.42)	-3.36 (0.43)
Change in outcome with a one-point increase in after-hours access in a practice at:			
25th percentile of clinical involvement of nonphysicians (10)	0.289 (0.87)	1.06 (0.76)	1.58 (0.63)
75th percentile of clinical involvement of nonphysicians (12)	🟩 **-3.82** **(0.09)**	0.34 (0.94)	-0.66 (0.89)
Change in outcome with a one-point increase in follow-up after acute care in a practice at:			
25th percentile of clinical involvement of nonphysicians (10)	🟩 **-5.68** **(0.003)**	🟥 ***7.22*** ***(0.04)***	-1.54 (0.67)
75th percentile of clinical involvement of nonphysicians (12)	🟩 **-5.45** **(0.02)**	0.113 (0.98)	-1.63 (0.71)

Note: Beneficiary-level analysis for N = 354,405 beneficiaries in 359 practices. *P*-values are shown in parentheses. Shading indicates statistical significance at the 0.10 level. **Red shading** *with italicized white text* signifies that our estimate was statistically significant and showed an increase in the service use or expenditures outcome; **green shading** **with bold text** signifies that an estimate was statistically significant and implied a reduction in the service use or expenditures outcome. Regressions control for beneficiary, practice, market characteristics, and practice's baseline outcome. We examine individual beneficiary-level data but report estimated associations for hospitalizations and outpatient ED visits per 1,000 beneficiaries for ease of interpretation.

9.7. Limitations

The results obtained here, like the synthesis findings presented in the last two annual reports on CPC, do not purport to represent causal relationships. That is, all analyses are correlational and observational, which is all that any attempt to link care delivery approaches to outcomes can be, absent a design that randomly assigns practices to particular care delivery approaches or to different incentives to make such improvements. Thus, although some associations are consistent with our expectations and the literature, we cannot infer that better care delivery approaches lead to decreased use of hospitals or EDs. The potential for such spurious correlations may be exacerbated by the fact that Medicare hospitalization rates nationally were declining over the 2012–2016 period that we examined—that is, other factors (that we did not observe in our data) may have affected hospitalizations as well as the degree of change in care delivery.

A second limitation is that although the models used are extensive, they are still relatively straightforward and likely far less complex than any true relationships. For example, theory tells us little about the measurement of care delivery approaches and changes—which ones are likely to influence outcomes and how, or how relationships are likely to vary with beneficiary, practice, and local health care environment characteristics. Unanswered questions, which we think merit further research in the future, include:

- How long does a practice have to operate at a high level on a care delivery measure before we can expect outcomes to improve?
- How intense does a practice's change need to be to influence outcomes?
- How should care delivery approaches be measured to best capture links to outcomes, and do the measures need to change over time?
- How can we overcome collinearity of M-PCMH-A measures without masking real relationships?
- What functional form best depicts the relationship between care delivery measures and outcomes?
- Are different cost and utilization outcomes affected differently by a given care delivery measure?
- Are outcomes related to both levels and changes in M-PCMH-A variables?
- Are there top-out effects, i.e., a limited ability to measure improvements in care delivery at the top end of the scale?
- How do the associations of care delivery approaches with outcomes vary with other care delivery approaches and with other local factors?
- Who is affected? (Only high-risk beneficiaries? When and how should we measure high risk?)
- How does the relationship between care delivery and outcomes differ for different practices?
- Do the adverse incentives of hospital-owned practices to minimize hospitalizations influence the relationship between practice transformations and outcomes, and if so, how?

A third factor that limits our ability to detect relationships between better care delivery approaches and improvements in key outcomes is the lack of strong incentives under CPC for individual practices to transform in ways that would result in substantially fewer hospitalizations and expenditures. Thus, among practices with equally high self-ratings on a care delivery measure, some may devote relatively little attention to focusing their efforts in ways that would reduce hospital and ED utilization and expenditures, reducing the likelihood that we will detect any such associations in the data.

Finally, in interpreting these results, it is important to remember that they are comparisons only among the CPC practices, which are a high-performing group. Thus, we have a seemingly anomalous situation of CPC leading to reductions in ED visits (as shown in Chapter 8) but no association found in this chapter between care delivery features and ED visits. However, our findings do not mean that care delivery approaches do not affect ED visits. Our results simply show that CPC practices that were slightly better than other CPC practices on follow-up after acute care did not have lower ED visit rates than those other CPC practices. Since over two-thirds of CPC practices had high ratings on our care delivery measures, the results suggest that the beneficiaries of practices with a score of 11 had ED visit rates similar to those of beneficiaries in practices with a score of 12. CPC practices were substantially better than comparison practices on this measure of follow-up care, which may well account for the lower ED visit rates found for beneficiaries in CPC than for beneficiaries in comparison practices.

9.8. Future work

Results from our synthesis analysis over the past three years suggest additional avenues for investigation to uncover important associations between care delivery approaches and better outcomes. The work continues to be important; to slow the growth in Medicare expenditures and improve care, future and ongoing initiatives will need to know which changes to primary care delivery approaches they should encourage or require. The evaluation of CPC+ offers valuable opportunities to continue this research.

This page has been left blank for double-sided copying.

REFERENCES

Agency for Healthcare Research and Quality. "Instructions for Analyzing Data from CAHPS Surveys: Using the CAHPS Analysis Program Version 4.1." Document no. 2015. Available at https://www.ahrq.gov/cahps/surveys-guidance/cg/12-month/index.html. Updated April 2, 2012.

Agency for Healthcare Research and Quality. "CAHPS Clinician & Group Surveys." Available at https://cahps.ahrq.gov/surveys-guidance/cg/index.html. Accessed September 21, 2015.

American Association for Public Opinion Research. "Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 9th edition." AAPOR, 2016.

Anglin, G., H. Tu, K. Liao, L. Sessums, and E.F. Taylor. "Strengthening Multipayer Collaboration: Lessons from the Comprehensive Primary Care Initiative." Milbank Quarterly, forthcoming.

Bindman, A.B., K. Grumbach, D. Osmond, M. Komaromy, K. Vranizan, N. Lurie, J. Billings, and A. Stewart. "Preventable Hospitalizations and Access to Health Care." *JAMA*, vol. 274, 1995, pp. 305–311.

Bodenheimer, T. Building Teams in Primary Care: Lessons Learned. 2007 California HealthCare Foundation, July 2007.

Bodenheimer, T., and B.Y. Laing. "The Teamlet Model of Primary Care." *Annals of Family Medicine*, vol. 5, 2007, pp. 457–461.

Cabana, M.D., and S.H. Jee. "Does Continuity of Care Improve Patient Outcomes?" *Journal of Family Practice*, vol. 53, 2004, pp. 974–980.

Caloyeras, J. P., M. Kanter, N. Ives, C. Y. Kim, H. K. Kanzaria, S. H. Berry, and R. H. Brook. "Physician Professional Satisfaction and Area of Clinical Practice: Evidence from an Integrated Health Care Delivery System." *The Permanente Journal*, vol. 20, no. 2, 2016, pp. 35–41.

Centers for Medicare & Medicaid Services (CMS). A summary of changes in Milestone requirements by year is available at https://innovation.cms.gov/Files/x/CPCI-Milestones.pdf.

Centers for Medicare & Medicaid Services (CMS). "Eligible Professional's Guide to Stage 2 of the EHR Incentive Programs." September 2013a. Available at: https://www.cms.gov/regulations-and-guidance/legislation/ehrincentiveprograms/downloads/stage2_guide_eps_9_23_13.pdf.

Centers for Medicare & Medicaid Services (CMS). Memorandum of Understanding Between the Center for Medicare & Medicaid Innovation And [Payer] in [Market] for the Comprehensive Primary Care Initiative. 2013b. https://innovation.cms.gov/Files/x/CPCI-MOU.pdf.

Centers for Medicare & Medicaid Services (CMS). "CPC Program Year 2016 Implementation and Milestone Reporting Summary Guide." December 2015a. Available at: https://downloads.cms.gov/files/cmmi/cpci-implementationguide2016.pdf.

Centers for Medicare & Medicaid Services (CMS). "Medicare Program: Revisions to Payment Policies Under the Physician Fee Schedule and Other Revisions to Part B for CY 2016." July 15, 2015b. Available at https://www.federalregister.gov/articles/2015/07/15/2015-16875/medicare-program-revisions-to-payment-policies-under-the-physician-fee-schedule-and-other-revisions.

Centers for Medicare & Medicaid Services (CMS). "Comprehensive Primary Care Plus." 2016. Available at https://innovation.cms.gov/initiatives/comprehensive-primary-care-plus. Accessed December 20, 2016.

Centers for Medicare & Medicaid Services (CMS). "2017 CPC+ Implementation Guide: Guiding Principles and Reporting." May 10, 2017a.

Centers for Medicare & Medicaid Services (CMS). "Comprehensive Primary Care Initiative Shared Savings Methodology Version 4.0." 2017b. Available at https://innovation.cms.gov/Files/x/Comprehensive-Primary-Care-Initiative-Shared-Savings-Methodology-PDF.pdf.

Christopher, A.S., C.S. Smith, R. Tivis, and A.P. Wilper. "Trends in United States Physician Work Hours and Career Satisfaction." *The American Journal of Medicine*, vol. 127, no. 7, July 2014, pp. 674–80. doi: 10.1016/j.amjmed.2014.03.033.

Chromy, J.R. "Sequential Sample Selection Methods." *Proceedings of the American Statistical Association, Survey Research Methods Section*. Alexandria, VA: American Statistical Association, 1979, pp. 401–406. Available at https://pdfs.semanticscholar.org/a041/1b8df53d0bb424478c5d92709b6b3a6ec605.pdf. Accessed November 15, 2013.

Coleman, E.A., C. Parry, S. Chalmers, and S.J. Min. "The Care Transitions Intervention: Results of a Randomized Controlled Trial." *Archives of Internal Medicine*, vol. 166, no. 17, September 25, 2006, pp. 1822–1828.

Dale, S.B., A. Ghosh, D.N. Peikes, T.J. Day, F.B. Yoon, E.F. Taylor, K. Swankoski, A.S. O'Malley, P.H. Conway, R. Rajkumar, M.J. Press, L. Sessums, and R. Brown. "Two-Year Costs and Quality in the Comprehensive Primary Care Initiative." *New England Journal of Medicine,* vol. 374, no. 24, June 2016, pp. 2345–2356.

Damschroder, L.J., D.C. Aron, R.E. Keith, S.R. Kirsh, J.A. Alexander, and L.C. Lowery. "Fostering Implementation of Health Services Research Findings into Practice: A Consolidated Framework for Advancing Implementation Science." *Implementation Science,* vol. 4, August 2009, p. 50. doi:10.1186/1748-5908-4-50.

Daniel, D.M., E.H. Wagner, K. Coleman, J.K. Schaefer, B.T. Austin, M.K. Abrams, K.E. Phillips, and J.R. Sugarman. (2013), Assessing Progress toward Becoming a Patient-Centered Medical Home: An Assessment Tool for Practice Transformation. Health Services Research, 48: 1879–1897.

Daughtridge, G.W., T. Archibald, and P.H. Conway. "Quality Improvement of Care Transitions and the Trend of Composite Hospital Care." *Journal of the American Medical Association,* vol. 311, no. 10, 2014, pp. 1013–1014.

David, G., C. Gunnarsson, P.A. Saynisch, R. Chawla, and S. Nigam. Do patient-centered medical homes reduce emergency department visits? Health Serv Res. 2014;50(2):418-39. First published August 12, 2014. doi: 10.1111/1475-6773.12218.

DeLia, D. "Calculating Shared Savings: Administrative Formulas Versus Research-Based Evaluations" Health Affairs Blog, September 26, 2016. Available at http://healthaffairs.org/blog/2016/09/26/calculating-shared-savings-administrative-formulas-versus-research-based-evaluations/.

De Maeseneer, J.M., L. De Prins, C. Gosset, and J. Heyerick. "Provider Continuity in Family Medicine: Does It Make a Difference for Total Health Care Costs?" *Annals of Family Medicine*, vol. 1, 2003, pp. 144–148.

Dolan, E.D., D. Mohr, M. Lempa, S. Joos, S.D. Fihn, K.M. Nelson, and C.D. Helfrich. "Using a Single Item to Measure Burnout in Primary Care Staff: A Psychometric Evaluation." *Journal of General Internal Medicine*, vol. 30, no. 5, May 2015, pp. 582–587. doi: 10.1007/s11606-014-3112-6.

Edwards, S.T., M. Marino, B.A. Balasubramanian, S. Valenzuela, R. Springer, A. Preston, L. Solberg, K.C. Stange, T. Kottke, B. Muller, T.T. Woodson, S.O. Hemler, C. Perry, W. Miller, and D.J. Cohen. "Burnout Among Providers and Staff in Small to Medium Size Primary Care Practices: Early Findings from EvidenceNOW." Presentation slides at Society of General Internal Medicine National Meeting, April 20, 2017.

Ettner, S.L. "The Relationship Between Continuity of Care and the Health Behaviors of Patients: Does Having a Usual Physician Make a Difference?" *Medical Care*, vol. 37, 1999, pp. 547–555.

Fisher, E.S., D.E. Wennberg, T.A. Stukel, D.J. Gottlieb, F.L. Lucas, and E.L. Pinder. "The Implications of Regional Variations in Medicare Spending. Part 2: Health Outcomes and Satisfaction with Care." *Annals of Internal Medicine*, vol. 138, 2003a, pp. 288–298.

Fisher, E.S., D.E. Wennberg, T.A. Stukel, D.J. Gottlieb, F.L. Lucas, and E.L. Pinder. "The Implications of Regional Variations in Medicare Spending. Part 1: The Content, Quality, and Accessibility of Care." *Annals of Internal Medicine*, vol. 138, 2003b, pp. 273–287.

Franks, P., and K. Fiscella. "Primary Care Physicians and Specialists as Personal Physicians. Health Care Expenditures and Mortality Experience." *The Journal of Family Practice*, vol. 47, 1998, pp. 105–109.

Friedberg, M.W., E.C. Schneider, M.B. Rosenthal, K.G. Volpp, and R.M. Werner. "Association Between Participation in a Multipayer Medical Home Intervention and Changes in Quality, Utilization, and Costs of Care." *JAMA,* vol. 311, no. 8, 2014, pp. 815–825. doi:10.1001/jama.2014.353.

Friedberg, M.W., P.G. Chen, K.R. Van Busum, F. Aunon, C. Pham, J. Caloyeras, S. Mattke, E. Pitchforth, D.D. Quigley, R.H. Brook, F.J. Crosson, and M. Tutty. "Factors Affecting Physicians Professional Satisfaction and their Implications for Patient Care, Health Systems, and Health Policy." Rand Health Quarter, vol. 3, no. 4, Winter 2014.

Friedberg, M.W., M.B. Rosenthal, R.W. Werner, K.G. Volpp, and E.C. Schneider. "Effects of a Medical Home and Shared Savings Intervention on Quality and Utilization of Care." *JAMA Internal Medicine,* vol. 175, no. 8, 2015, pp. 1362–1368. doi:10.1001/jamainternmed.2015.2047.

Gelman, A. and J. Carlin. "Beyond Power Calculations: Assessing Type S (Sign) and Type M (Magnitude) Errors." *Perspectives on Psychological Science,* vol. 9, no. 6, 2014, pp. 641–651.

Gelman, A., Y. Su, M. Yajima, J. Hill, M.G. Pittau, J. Kerman, T. Zheng, and V. Dorie. "Data Analysis Using Regression and Multilevel/Hierarchical Models." R package version 1.9-3, 2016.

Gerteis, M., D. Peikes, A. Ghosh, L. Timmins, A.S. O'Malley, M. Barna, E.F. Taylor, T.J. Day, K. Swankoski, P. Payne, and R. Brown. "Uses and Limitations of Claims-Based Performance Feedback Reports: Lessons from the Comprehensive Primary Care Initiative." Journal for Healthcare Quality (forthcoming).

Gilfillan, R.J., J. Tomcavage, M.B. Rosenthal, D.E. Davis, J. Graham, J.A. Roy, S.B. Pierdon, F.J. Bloom Jr., T.R. Graf, R. Goldman, K.M. Hamory, R.A. Paulus, and G.D. Steele Jr.. "Value and the Medical Home: Effects of Transformed Primary Care." *American Journal of Managed Care*, vol. 16, no. 8, 2010, pp. 607–614.

Gill, J.M., A.G. Mainous 3rd, and M. Nsereko. "The Effect of Continuity of Care on Emergency Department Use." *Archives of Family Medicine*, vol. 9, 2000, pp. 333–338.

Gordon, M. "Gmisc: Descriptive Statistics, Transition Plots, and More." R package version 1.4.1, 2016.

Grol, R., P. Giesen, and C. van Uden. "After-Hours Care in the United Kingdom, Denmark, and the Netherlands: New Models." *Health Affairs (Millwood)*, vol. 25, 2006, pp. 1733–1737.

Guo, J., J. Gabry, B. Goodrich, and D. Lee. "R Interface to Stan." R package version 2.16.2, 2017.

Healthcare Analysis & Information Group. 2012 Patient Aligned Care Team (PACT) Personnel Survey.

Helfrich, C., E. Dolan, J. Simonetti, R.J. Reid, S. Joos, B.J. Wakefield, G. Schectman, R. Stark, S.D. Fihn, H.B. Harvey, and K. Nelson. "Elements of Team-Based Care in a Patient-Centered Medical Home Are Associated with Lower Burnout Among VA Primary Care Employees." *Journal of General Internal Medicine*, vol. 29, suppl. 2, 2014, pp. S659–S666.

Heyworth, L., A. Bitton, S.R. Lipsitz, T. Schilling, G.D. Schiff, D.W. Bates, and S.R. Simon. "Patient-Centered Medical Home Transformation with Payment Reform: Patient Experience Outcomes." *American Journal of Managed Care*, vol. 20, no. 1, 2014, pp. 26–33.

Hussey, P.S., E.C. Schneider, R.S. Rudin, S. Fox, J. Lai, and C.E. Pollack. "Continuity and the Costs of Care for Chronic Disease." *JAMA Internal Medicine*, 2014, 245, Epub.

Institute of Medicine (US) Committee on the Future of Primary Care. *Primary Care: America's Health in a New Era*. Edited by Molla S. Donaldson, et al. National Academies Press, 1996.

Jaén, C.R., R.L. Ferrer, W.L. Miller, R.F. Palmer, R. Wood, M. Davila, E.E. Stewart, B.F. Crabtree, P.A. Nutting, and K.C. Stange. "Patient Outcomes at 26 Months in the Patient-Centered Medical Home National Demonstration Project." *Annals of Family Medicine*, vol. 8, suppl. 1, 2010, pp. S57–S67. doi:10.1370/afm.1121.

Jerant, A., K.D. Bertakis, J.J. Fenton, and P. Franks. "Extended Office Hours and Health Care Expenditures: A National Study." *Annals of Family Medicine*, vol. 10, 2012, pp. 388–395.

Kahn, K.L., J.W. Timbie, M.W. Friedberg, P.Mendel, L. Hiatt, E.K. Chen, A.M. Kress, C. Buttorff, T. Lavelle, B.A. Weidmer, H.D. Green, M. Kommareddi, R. Malsberger, A. Kofner, A. Rastegar, and C.M. Setodji. "Evaluation of CMS's Federally Qualified Health Care (FQHC) Advanced Primary Care Practice (APCP) Demonstration." Final report. Santa Monica, CA: Rand, 2016.

Keith, R.E., J.C. Crosson, A.S. O'Malley, D. Cromp, E.F. Taylor. Using the Consolidated Framework for Implementation Research (CFIR) to produce actionable findings: a rapid-cycle evaluation approach to improving implementation. Implement Sci. 2017 Feb 10;12(1):15.

Kern, L.M., R.V. Dhopeshwarkar, A. Edwards, and R. Kaushal. "Patient Experience Over Time in Patient-Centered Medical Homes." *American Journal of Managed Care*, vol. 19, no. 5, 2013, pp. 403–410.

Kringos, D.S., W.G.W. Boerma, J. van der Zee, and P.P. Groenewegen. "The Contribution of Primary Care to Health Care System Performance in Europe." In *The Strength of Primary Care in Europe*, edited by D.S. Kringos. Utrecht, Netherlands: Nivel, 2012.

Lance, C.E. "The Sources of Four Commonly Reported Cutoff Criteria: What Did They Really Say?" *Organizational Research Methods*, vol. 9, no. 2, 2006, pp. 202–220. Available at http://doi.org/10.1177/1094428105284919.

Landon, B.E., J. Reschovsky, and D. Blumenthal. “Changes in career satisfaction among primary care and specialist physicians, 1997–2001.” *Journal of the American Medical Association*, vol. 289, no. 4, January 2003.

Le Berre, M., G. Maimon, N. Sourial, M. Guériton, and I. Vedel. “Impact of Transitional Care Services for Chronically Ill Older Patients: A Systematic Evidence Review.” *Journal of the American Geriatrics Society*, vol. 65, no. 7, July 2017, pp. 1597–1608.

Lewis, S.E., R.S. Nocon, H. Tang, S.Y. Park, A.M. Vable, L.P. Casalino, E.S. Huang, M.T. Quinn, D.L. Burnet, W.T. Summerfelt, J.M. Birnberg, and M.H. Chin. “Patient-Centered Medical Home Characteristics and Staff Morale in Safety Net Clinics.” *Archives of Internal Medicine,* vol. 172, no. 1, 2012, pp. 23–31.

Leykum, L.K., R. Palmer, H. Lanham, M. Jordan, R.R. McDaniel, P.H. Noel, and M. Parchman. "Reciprocal Learning and Chronic Care Model Implementation in Primary Care: Results from a New Scale of Learning in Primary Care." *BMC Health Services Research,* vol. 11, 2001, p. 44.

Linzer, M., M. Gerrity, J.A. Douglas, J.E. McMurray, E.S. Williams, and T.R. Konrad. “Physician Stress: Results from The Worklife Study.” *Stress & Health*, vol. 18, no. 1, Feb 2002, pp. 37–42.

Linzer, M., L.B Manwell, M. Mundt, E. Williams, A. Maguire, M. McMurray, and M.B. Plane. “Organizational Climate, Stress, and Error in Primary Care: The MEMO Study Findings.” *Advances in Patient Safety: From Research to Implementation (Volume 1: Research Findings)*, 2005, pp. 65–77.

Linzer, M., L.B. Manwell, E.S. Williams, J.A. Bobula, R.L. Brown, A.B. Varkey, B. Man, J.E. McMurray, A. Maguire, B. Horner-Ibler, M.D. Schwartz, MEMO (Minimizing Error, Maximizing Outcomes) Investigators. “Working Conditions in Primary Care: Physician Reactions and Care Quality.” *Annals of Internal Medicine*, vol. 151, no. 1, July 7, 2009, pp. 28–36, W6-9.

Linzer, M., S. Poplau, E. Grossman, A. Varkey, S. Yale, E. Williams, L. Hicks, R.L. Brown, J. Wallock, D. Kohnhorst, and M. Barbouche. “A Cluster Randomized Trial of Interventions to Improve Work Conditions and Clinician Burnout in Primary Care: Results from the Healthy Work Place (HWP) Study.” *Journal of General Internal Medicine*, vol. 30, no. 8, 2015, pp. 1105–1111. doi: 10.1007/s11606-015-3235-4.

Lumley, T. “Survey: Analysis of Complex Survey Samples.” R package version 3.31-5, 2016.

Macinko, J., B. Starfield, and L. Shi. “Quantifying the Health Benefits of Primary Care Physician Supply in the United States.” *International Journal of Health Services*, vol. 37, 2007, pp. 111–126.

Maeng, D.D., D.E. Davis, J. Tomcavage, T.R. Graf, and K.M. Procopio. "Improving Patient Experience by Transforming Primary Care: Evidence from Geisinger's Patient-Centered Medical Homes." *Population Health Management*, vol. 16, no. 3, 2013, pp. 157–163. doi:10.1089/pop.2012.0048.

Mainous, A.G. 3rd, and J.M. Gill. "The Importance of Continuity of Care in the Likelihood of Future Hospitalization: Is Site of Care Equivalent to a Primary Clinician?" *American Journal of Public Health*, vol. 88, 1998, pp. 1539–1541.

Maslach C., S. Jackson, and M. Leiter. *Maslach Burnout Inventory Manual*. Palo Alto, CA: Consulting Psychologists Press; 1996.

Maslach C., W.B. Schaufeli, and M.P. Leiter "Job Burnout." Annual Review of Psychology, vol. 52, 2001, pp. 397–422.

McManus I.C., B.C. Winder, and D. Gordon. "The Causal Links Between Stress and Burnout in a Longitudinal Study of UK Doctors." *The Lancet*, vol. 359, 2002, pp. 2089–2090. doi: 10.1016/S0140-6736(02)08915-8.

McManus I.C., E. Smithers, P. Partridge, A. Keeling, and P.R. Fleming. "A Levels and Intelligence as Predictors of Medical Careers in UK Doctors: 20-year Prospective Study," *British Medical Journal*, vol. 327, 2003, pp. 139–142.

National Committee for Quality Assurance. "Specifications for the CAHPS PCMH Survey 2012." Washington DC: National Committee for Quality Assurance, 2011.

Nichols D., S. Haber, M. Romaire, and contributing authors. "Evaluation of the Multi-Payer Advanced Primary Care Practice (MAPCP) Demonstration Final Report." Research Triangle Park, NC: RTI International, 2017.

Nunnally, J., and I. Bernstein. *Psychometric Theory (3rd ed.)*. McGraw-Hill Humanities/Social Sciences/Languages, 1994.

Nutting, P.A., B.F. Crabtree, W.L. Miller, E.E. Stewart, K.C. Stange, and C.R. Jaén. "Journey to the Patient-Centered Medical Home: A Qualitative Analysis of the Experiences of Practices in the National Demonstration Project." *Annals of Family Medicine*, vol. 8, suppl. 1, 2010, pp. s45–s56. doi:10.1370/afm.1075.

Nyweide, D.J., D.L. Anthony, J.P. Bynum, R.L. Strawderman, W.B. Weeks, L.P. Casalino, and E.S. Fisher. "Continuity of Care and the Risk of Preventable Hospitalization in Older Adults." *JAMA Internal Medicine*, vol. 173, November 2013, pp. 1879–1885.

O'Malley, A.S. "After-Hours Access to Primary Care Practices Linked with Lower Emergency Department Use and Less Unmet Medical Need." *Health Affairs (Millwood)*, vol. 32, 2013, pp. 175–183.

O'Malley, A.S., E.C. Rich, A. Maccarone, C.M. DesRoches, and R.J. Reid. “Disentangling the Linkage of Primary Care Features to Patient Outcomes: A Review of Current Literature, Data Sources, and Measurement Needs.” *Journal of General Internal Medicine*, vol. 30, suppl. 3, August 2015, pp. S576–S585.

O’Malley, A.S., K. Swankoski, D. Peikes, J. Crosson, N. Duda, T. Day, and S. Heitkamp. “Patient Dismissal by Primary Care Practices.” *JAMA Internal Medicine*, vol. 177, no. 7, July 2017a, pp. 1048–1050.

O’Malley, A.S., D. Peikes, C. Wilson, R. Gaddes, V. Peebles, T. Day, and J. Jin. “Patient Perspectives on Care Management from the Comprehensive Primary Care Initiative: A Qualitative Study.” *American Journal of Managed Care*, vol. 23, no. 11, 2017b, pp. 684-689.

Panagioti, M., E. Panagopoulou, P. Bower, G. Lewith, E. Kontopantelis, C. Chew-Graham, S. Dawson, H. van Marwijk, K. Geraghty, and A. Esmail. “Controlled Interventions to Reduce Burnout in Physicians: A Systematic Review and Meta-analysis.” *JAMA Internal Medicine*. vol. 177, no. 2, February 1, 2017, pp. 195–205. doi: 10.1001/jamainternmed.2016.7674.

Peikes, D., A. Chen, J. Schore, and R. Brown. “Effects of Care Coordination on Hospitalization, Quality of Care, and Health Care Expenditures Among Medicare Beneficiaries: 15 Randomized Trials.” *JAMA*, vol. 301, no. 6, February 11, 2009, pp. 603–618.

Peikes, D., E. Taylor, S. Dale, and contributing authors. “Evaluation of the Comprehensive Primary Care Initiative: Design Report.” Report submitted to the U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services. Princeton, NJ: Mathematica Policy Research, Inc., February 28, 2014.

Peikes, D., E. Taylor, S. Dale, A. O’Malley, A. Ghosh, G. Anglin, K. Swankoski, A. Zutshi, L. Converse, R. Brown, and contributing authors. “Evaluation of the Comprehensive Primary Care Initiative: Second Annual Report.” Prepared for the Centers for Medicare & Medicaid Services. Princeton, NJ: Mathematica Policy Research, April 2016a.

Peikes, D., G. Anglin, E. Taylor, S. Dale, A. O’Malley, A. Ghosh, K. Swankoski, L. Converse, R. Keith, M. Finucane, J. Crosson, A. Mutti, T. Grannemann, A. Zutshi, R. Brown, and contributing authors. “Evaluation of the Comprehensive Primary Care Initiative: Third Annual Report.” Prepared for the Centers for Medicare & Medicaid Services. Princeton, NJ: Mathematica Policy Research, December 2016b.

Peikes. D., A.S. O’Malley, C. Wilson, J. Crosson, R. Gaddes, B. Natzke, T.J. Day, D. Cromp, R. Keith, J. Little, and J. Ralston. “Early Experiences Engaging Patients Through Patient and Family Advisory Councils.” *Journal of Ambulatory Care Management*, vol. 39, no. 4, Oct–Dec 2016c, pp. 316–324.

Phillips, R.L. Jr, and A.W. Bazemore. “Primary Care and Why It Matters for U.S. Health System Reform.” *Health Affairs (Millwood)*, vol. 29, 2010, pp. 806–810.

Pines J.M., V. Keyes, M. van Hasselt, and N. McCall. “Emergency department and inpatient hospital use by Medicare beneficiaries in patient-centered medical homes.” *Ann Emerg Med*. 2015;65(6):652-60. Published online Mar 10, 2015. doi: 10.1016/j.annemergmed.2015.01.002.

Pope G.C., J. Kautter, R.P. Ellis, A.S. Ash, J.Z. Ayanian, L.I. Iezzoni, M.J. Ingber, J.M. Levy, and J. Robst. “Risk Adjustment of Medicare Capitation Payments Using the CMS-HCC Model.” *Health Care Financing Review,* vol. 25, 2004, pp. 119–141.

Poznyak, D., D.N. Peikes, B.A. Wakar, R.S, Brown, and R.J. Reid. “Development and Validation of the Modified Patient-Centered Medical Home Assessment for the Comprehensive Primary Care Initiative.” *Health Services Research*, March 13, 2017. doi: 10.1111/1475-6773.12673.

Puffer, J.C., C. Knight, T.R. O’Neill, M. Rassolian, A.W. Bazemore, L.E. Peterson, and E.G. Baxley. “Prevalence of Burnout in Board Certified Family Physicians.” *Journal of the American Board of Family Medicine*, vol. 30, 2017, pp. 125–126.R Core Team.

“R: A Language and Environment for Statistical Computing.” Vienna, Austria: R Foundation for Statistical Computing, 2016. Available at https://www.R-project.org/.

Raddish, M., S.D. Horn, and P.D. Sharkey. “Continuity of Care: Is It Cost Effective?” *American Journal of Managed Care*, vol. 5, 1999, pp. 727–734.

RAND Corporation. “Evaluation of CMS FQHC Advanced Primary Care Practices (APCP) Demonstration Clinician and Staff Experience (CASE) Survey.” Santa Monica, CA: RAND Corporation, administered starting April 2013.

Reddy, A., A. Canamucio, and R.M. Werner. “Impact of the Patient-Centered Medical Home on Veterans’ Experience of Care.” *American Journal of Managed Care*, vol. 21, no. 6, 2015, pp. 413–421.

Reid, R.J., P.A. Fishman, O. Yu, T.R. Ross, J.T. Tufano, M.P. Soman, and E.B. Larson. “Patient-Centered Medical Home Demonstration: A Prospective, Quasi-Experimental, Before and After Evaluation.” *American Journal of Managed Care*, vol. 15, no. 9, 2009, pp. e71–e87.

Reid, R.J., K. Coleman, E.A. Johnson, P.A. Fishman, C. Hsu, M.P. Soman, C.E. Trescott, M. Erikson, and E.B. Larson. “The Group Health Medical Home at Year Two: Cost Savings, Higher Patient Satisfaction, and Less Burnout for Providers.” *Health Affairs (Millwood)*, vol. 29, no. 5, 2010, pp. 835–843. doi:10.1377/hlthaff.2010.0158.

Rohland, B.M., G.R. Kruse, and J.E. Rohrer. “Validation of a Single-Item Measure of Burnout Against the Maslach Burnout Inventory Among Physicians.” *Stress and Health,* vol. 20, 2004, pp. 75–79.

Rosenblatt, R.A., G.E. Wright, L.M. Baldwin, L. Chan, P. Clitherow, F.M. Chen, and L.G. Hart. “The Effect of the Doctor-Patient Relationship on Emergency Department Use Among the Elderly.” *American Journal of Public Health*, vol. 90, 2000, pp. 97–102.

Rosenthal, M.B., M.W. Friedberg, S.J. Singer, D. Eastman, Z. Li, and E.C. Schneider. "Effect of a Multipayer Patient-Centered Medical Home on Health Care Utilization and Quality: The Rhode Island Chronic Care Sustainability Initiative Pilot Program." *JAMA Internal Medicine*, vol. 173, no. 20, 2013, pp. 1907–1913. doi:10.1001/jamainternmed.2013.10063.

Rosenthal, M.B., S. Alidina, M.W Friedberg, S.J. Singer, D. Eastman, Z. Li, and E.C. Schneider. "A Difference-in-Difference Analysis of Changes in Quality, Utilization and Cost Following the Colorado Multi-Payer Patient-Centered Medical Home Pilot." *Journal of General Internal Medicine*, vol. 31, no. 3, March 2016, pp. 289–296. doi:10.1007/s11606-015-3521-1.

Safety Net Medical Home Initiative. "The Patient-Centered Medical Home Assessment Version 1.3." Seattle, WA: The MacColl Center for Health Care Innovation at Group Health Research Institute and Qualis Health, September 2010.

Shanafelt, T.D., O. Hasan, L.N. Dyrbye, C. Sinsky, D. Satele, J. Sloan, and C.P. West. "Changes in Burnout and Satisfaction with Work-Life Balance in Physicians and the General U.S. Working Population Between 2011 and 2014." *Mayo Clinic Proceedings*, vol. 90, no. 12, December 2015, pp. 1600–1613.

Shi, L. "Primary Care, Specialty Care, and Life Chances." *International Journal of Health Services*, vol. 24, 1994, pp. 431–458.

Shi, L., J. Macinko, B. Starfield, R. Politzer, and J. Xu. "Primary Care, Race, and Mortality in U.S. States." *Social Science Medicine*, vol. 61, 2005, pp. 65–75.

Starfield, B. Primary Care: Balancing Health Needs, Services and Technology. New York: Oxford University Press, 1998.

Starfield, B., L. Shi, and J. Macinko. "Contribution of Primary Care to Health Systems and Health." *The Milbank Quarterly*, vol. 83, pp. 457–502.

Stremikis, K. "All Aboard: Engaging Self-Insured Employers in Multipayer Reform." Milbank Memorial Fund, 2015. Available at http://www.pbgh.org/storage/documents/Milbank_-_PBGH_Report_FINAL_2_17_15.pdf. Accessed December 20, 2016.

Taylor, E.F., S. Dale, D. Peikes, R. Brown, A. Ghosh, J. Crosson, G. Anglin, R. Keith, R. Shapiro, and contributing authors. "Evaluation of the Comprehensive Primary Care Initiative: First Annual Report." Report prepared for the U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services. Princeton, NJ: Mathematica Policy Research, January 2015.

Van der Heijden, F., G. Dillingh, A. Bakker, and J. Prins. "Suicidal Thoughts Among Medical Residents with Burnout." *Archives of Suicide Research*, vol. 12, no. 4, 2008, pp. 344–346.

Weiss, L.J., and J. Blustein. "Faithful Patients: The Effect of Long-Term Physician-Patient Relationships on the Costs and Use of Health Care by Older Americans." *American Journal of Public Health*, vol. 86, 1996, pp. 1742–1747.

Werner, R.M., M. Duggan, K. Duey, J. Zhu, and E.A. Stuart. “The Patient-Centered Medical Home: An Evaluation of a Single Private Payer Demonstration in New Jersey.” *Medical Care*, vol. 51, no. 6, 2013, pp. 487–493. doi:10.1097/MLR.0b013e31828d4d29.

Werner, R.M., A. Canamucio, J.A. Shea, and G. True. “The Medical Home Transformation in the Veterans Health Administration: An Evaluation of Early Changes in Primary Care Delivery. *Health Services Research*, vol. 49, no. 4, 2014, pp. 1329–1347. doi:10.1111/1475-6773.12155.

West C., L. Dyrbye, J. Sloan, and T. Shanafelt. “Single Item Measures of Emotional Exhaustion and Depersonalization are Useful for Assessing Burnout in Medical Professionals.” *Journal of General Internal Medicine*, vol. 24, no. 12, 2009, pp. 1318–1321.

West C.P., L.N. Dyrbye, D.V. Satele, J.A. Sloan, and T.D. Shanafelt. “Concurrent Validity of Single-Item Measures of Emotional Exhaustion and Depersonalization in Burnout Assessment.” *Journal of General Internal Medicine*, vol. 27, no. 11, 2012, pp. 1445–52.

West C.P., L.N. Dyrbye, P.J. Erwin, and T.D. Shanafelt. “Interventions to Prevent and Reduce Physician Burnout: A Systematic Review and Meta-Analysis.” September 28, 2016. *The Lancet*. doi:10.1016/S0140-6736(16)31279-X.

Williams, S.S., and A. Heller. “Patient Activation Among Medicare Beneficiaries: Segmentation to Promote Informed Health Care Decision Making.” *International Journal of Pharmaceutical and Healthcare Marketing,* vol. 1, no. 3, 2007, pp. 199–213.

Williams, S.S., and S.L. Frost. “Differences Among Consumer Segments with Regard to Perceptions of Comparative Effectiveness Research.” *Journal of Comparative Effectiveness Research*, vol. 3, no. 6, 2014, pp. 617–622.

World Health Organization. Primary Health Care. Geneva: World Health Organization, 1978.

Wurm W., K. Vogel, A. Holl, C. Ebner, D. Bayer, S. Morkl, I.S. Szilagyi, E. Hotter, H.P. Kapfhammer, and P. Hofmann. “Depression-Burnout Overlap in Physicians.” *PLoS One*, vol 11, no. 3, 2016.

Xie, Y. “Knitr: A General-Purpose Package for Dynamic Report Generation in R.” R package version 1.15.1, 2016.

Zickafoose, J.S., L.R. DeCamp, and L.A. Prosser. “Association Between Enhanced Access Services in Pediatric Primary Care and Utilization of Emergency Departments: A National Parent Survey.” *Journal of Pediatrics*, vol. 163, 2013, pp. 1389–1395.e1-6.

This page has been left blank for double-sided copying.