



Evaluation of the Primary Care First Model

Second Annual Report

February 2024

Evaluation of the Primary Care First Model

Second Annual Report

February 2024

Lead authors:

John Schurrer, Lori Timmins, Mario Gruszczynski, Karen Bogen, Brianna Sullivan, Boyd Gilman, Jake Vogler, Lauren Vollmer Forrow, Laura Blue, Leslie Conwell, Rosalind Keith, Nancy McCall

Contributing authors (alphabetical):

Rocky Aikens, Michael Barna, Nadia Bell, Genna Cohen, Margaret Coit, Ellie Coombs (Mission Analytics), Lyra Cooper, Liz Crane (Mission Analytics), James Drury, Laurie Felland, Laura Hanson, Shannon Heitkamp, Heather Ingraham, Joseph Lovins, Tristan Lutz, Rosette Nguyen, Victoria Peebles, Kristanna Peris, Natalie Porter, Daryn Smith, Asta Sorensen, Christa Speicher, Dan Thal, Jacob Thomas, Amanda Tran, Carol Urato, Mira Wang

Submitted to:

U.S. Department of Health and Human Services
Center for Medicare & Medicaid Innovation
7500 Security Boulevard
Baltimore, MD 21244
Project Officer: Timothy Day
Contract Number:
HHS-500-2014-00034I/75FCMC19F0005

Submitted by:

Mathematica
1100 1st Street NE, 12th Floor
Washington, DC 20002-4221
Project Director: Nancy McCall
Deputy Project Directors:
Laura Blue and Leslie Conwell
Reference Number: 50886

Acknowledgements

The authors gratefully acknowledge the guidance and contributions of our project officers, Timothy Day and Georgia Pearson. In addition, we also gratefully acknowledge Ann O'Malley for her quality assurance reviews, and Donovan Griffin, Sheryl Friedlander, and Jacqueline Phan for carefully editing and producing this report. We are grateful to our colleagues from Johns Hopkins University (Vaadeem Dukhanin and Sydney Dy), who participated in conducting interviews and coding. We also appreciate support from Megan Baker; Swaati Bangalore; Christian Carrillo Paz; Nancy Duda; Claire Erba; Tessa Huffman; Swad Komanduri; Nicola Lowry; Nicholas Manderlink; Maya Palakal; Margaret Raskob; Carol Razafindrakoto; Tom Sikes; Lalitha Sundaresan; Dayna Valek; Beny Wu; Suzanne Wensky; the CMS Model Team; and staff from RTI, Telligen, ARC, and Deloitte.

Disclaimer

The Centers for Medicare & Medicaid Services funded this project under contract no. HHSM-500-2014-00034I, Task Order 75FCMC19F0005. The statements contained in this report are solely those of the authors and do not necessarily reflect the views or policies of the Centers for Medicare & Medicaid Services. Mathematica assumes responsibility for the accuracy and completeness of the information contained in this report.

Contents

Executive summary	xviii
1. Introduction	1
A. Overview of the Primary Care First Model.....	1
B. PCF evaluation goals for the second annual report.....	4
C. Logic model and causal pathways guiding the evaluation	4
1. Use of the PCF logic model to illustrate how the PCF model aims to achieve intended outcomes	4
2. Use of causal pathways to guide evaluation findings for the Second Annual Report.....	6
D. Organization of the report.....	7
2. The characteristics of practices participating in PCF and the payers partnering with CMS	10
A. Focus of this chapter	11
B. The reach of PCF nationwide and in PCF regions	12
C. The characteristics of PCF practices and beneficiaries and their representativeness within PCF regions.....	13
1. Characteristics of PCF practices, by cohort	14
2. Characteristics of beneficiaries attributed to PCF practices, by cohort.....	15
3. The extent of disparities in acute care use among PCF beneficiaries before PCF	19
D. Reasons practices or their parent organizations chose to participate in or withdraw from PCF.....	20
1. Reasons practices joined PCF.....	21
2. Parent organizations’ role in PCF practice participation.....	21
3. Reasons practices withdrew from the PCF Model and characteristics of withdrawn practices.....	22
E. Payer partnerships.....	24
1. Regional payer participation in PCF.....	25
2. The extent of payer partnership and the characteristics of payer partners	26
3. Payers’ motivations for partnering in PCF	27
4. Payers’ perceptions of multi-payer collaboration in PCF	27
5. Payers’ approach to contracting with PCF practices	27

3. Payments and supports practices receive and how practices experience them 28

- A. Focus of this chapter 28
- B. PCF Model payments 29
 - 1. Population-based payments 31
 - 2. Payment accuracy adjustment 34
 - 3. Flat visit fees 36
 - 4. Performance-based adjustments (including Quality Gateway performance) 37
 - 5. Comparison of PCF payments with the payments under the Medicare physician fee schedule for Cohort 2 practices 39
 - 6. Practices’ perception of the adequacy of PCF payments 41
- C. Practice and practitioner exposure to incentives of the PCF Model 42
- D. Payer partner payments offered to PCF practices 43
 - 1. Alternative to fee-for-service payments 46
 - 2. Performance-based adjustments 46
- E. Practices’ experiences with data feedback and learning supports from CMS and other payer partners 47
 - 1. Data tools 47
 - 2. Learning supports 49
 - 3. Waivers and beneficiary engagement incentives 50

4. How did participating practices approach PCF during their first year of participation? 51

- A. Focus of this chapter 52
- B. Putting PCF practice activities in context: Care delivery requirements and causal pathways 53
- C. Care delivery changes practices reported making in their first year of PCF 55
- D. PCF practice profiles: Key differences in reported care delivery changes between different types of practices 58
- E. Practices’ challenges and achievements in their first year of PCF participation 61

5. Care delivery changes implemented under PCF and evidence that practices are making progress along their causal pathways	63
A. Introduction.....	63
B. Contextual factors influencing implementation of changes under PCF.....	65
C. Changes in care delivery under PCF among practices in risk groups 1 and 2.....	69
1. Care management.....	69
2. Comprehensiveness and coordination.....	78
3. Activities in other primary care functions.....	85
D. Care delivery changes among practices in risk groups 3 and 4.....	85
1. Care delivery changes.....	86
2. Intended effects on outcomes.....	88
E. Evidence of early effects.....	90
6. Preliminary impact estimates of the PCF Model on outcomes.....	94
A. Focus of this chapter.....	94
B. Early effects of PCF on primary outcomes.....	98
C. Early effects of PCF on secondary outcomes.....	99
D. Differences in early effects by subgroups.....	102
7. Conclusion.....	105
A. Focus of this chapter.....	105
B. Conclusion and implications for PCF and future models.....	105
C. Next steps for the PCF evaluation.....	110
References	111
Appendix A.1. Primary data collection methods and processes	A.1
A.1.1. Payer worksheet	A.1
A.1.2. Payer interviews.....	A.1
A.1.3. Payer exit interviews	A.1
A.1.4. PCF Practice Portal data	A.1
A.1.5. Methods for identifying and interviewing a sample of practices participating in PCF 6	

A.1.6. Methods for identifying and interviewing a sample of parent organizations..... A.13

A.1.7. Practice exit interviews..... A.20

Appendix A.2. Additional methodological details of processing and analyzing secondary data..... A.22

A.2.1. Attribution and assignment..... A.22

A.2.2. Methods to analyze practice participation in PCF..... A.33

A.2.3. Payment calibration analysis A.36

A.2.4. Constructing claims-based measures A.40

A.2.5. Comparison Group Selection A.51

A.2.6. Empirical strategy of the frequentist (main) regression analyses..... A.77

A.2.7. Details of the hybrid frequentist-Bayesian methodological approach..... A.86

Appendix B.1. Additional payer data..... B.1

Appendix B.2. Additional results on practice participation in PCF..... B.10

B.2.1. Reach of PCF within PCF regionsB.10

B.2.2. Comparison of PCF regions with non-PCF regionsB.11

B.2.3. Additional characteristics of primary care practices in PCF regions.B.13

B.2.4. Characteristics of withdrawn PCF practices.B.26

Appendix B.3. Assessment of baseline health disparities in PCF practices B.32

B.3.1. Overview of approach.....B.32

B.3.2. Disparities in overall acute care use.....B.33

B.3.3. Disparities in potentially preventable or substitutable acute careB.35

Appendix B.4. Payment findings..... B.37

B.4.1. Services included in PCF Model payment components.....B.37

B.4.2. Population-based payments in 2022B.38

B.4.3. Performance-based adjustments in 2022.....B.41

B.4.4. Average PCF payments by cohort in 2022.....B.45

Appendix B.5. Quality Gateway measure performance B.46

Appendix B.6. Items asked in the PCF Practice Portal.....	B.48
Chapter 1. Access and continuity	B.48
Chapter 2. Care management.....	B.51
Chapter 3. Comprehensiveness and coordination.....	B.54
Chapter 4. Patient and caregiver engagement	B.56
Chapter 5. Planned care and population health.....	B.56
Chapter 6. General model questions.....	B.57
Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1	B.70
Appendix B.8. PCF practices’ main strategies to try to reduce acute hospitalizations and/or costs during their first year of participation in PCF	B.114
Appendix B.9. Frequencies for PCF Practice Portal items: Baseline.....	B.115
Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only	B.120
Appendix B.11. Frequencies on portal responses by practices’ main transformation strategy	B.134
Appendix B.12. Physician engagement in PCF leadership and implementation and the effect of PCF on physicians’ time.....	B.137
B.12.1. Background	B.137
B.12.2. Data sources and methods.....	B.138
B.12.3. Findings.....	B.139
B.12.4. Conclusions	B.145
Appendix B.13. Sensitivity tests conducted to test the robustness of our main findings for Medicare Part A and B expenditures.....	B.146
Appendix B.14. Detailed findings from impact analyses of main outcomes and subgroup analyses not presented in main text.....	B.148
A. Full results for leading indicators	B.148
B. Full results by practice subgroup	B.149
C. PCF and comparison means.....	B.155
D. Hybrid frequentist-Bayesian impact estimates	B.167

Exhibits

ES.1. PCF payments were higher than payments would have been under FFSxxii

ES.2. Practices reported making many care delivery changes in their first year of PCFxxiv

1.1. Goals, practice eligibility criteria, payment, and data-shINISHED. iSaring options for PCF 3

1.2. PCF logic model 5

1.3. Relationship between primary care functions and causal pathways..... 6

1.4. High-level PCF causal pathway for improving patient care..... 7

1.5. Our evaluation of the second Performance Year of the PCF Model relied on primary and secondary data sources..... 7

1.6. Road map to the second annual report of the PCF evaluation 8

2.1. Attribution of beneficiaries to primary care practices..... 11

2.2. Data sources used in this chapter 11

2.3. Nearly 3,000 practices in 25 PCF regions participated in PCF in 2022 12

2.4. Practice affiliation with a parent organization 13

2.5. Most PCF practices were assigned to the lowest risk group when they joined the model..... 14

2.6. PCF practices were large, with high rates of affiliation with a parent organization and prior transformation experience..... 15

2.7. Beneficiaries attributed to PCF practices were disproportionately White and less likely to be dually eligible for Medicaid and Medicare and the Part D low-income subsidy..... 16

2.8. Practices that participated in CPC+ had lower rates of acute hospitalizations..... 19

2.9. In a baseline assessment, beneficiaries in PCF practices exhibited disparities in acute care use by race, ethnicity, socioeconomic status, and residence area..... 20

2.10. Being a leader in care transformation and improving quality of care were the top reasons for participating in PCF..... 21

2.11. Concerns with the PAAs for Cohort 1 and joining ACO REACH for Cohort 2 were the most common reasons for withdraws in 2022..... 23

2.12. There were no substantial differences in the payment accuracy or performance-based adjustments between withdrawn practices and those that remained in PCF..... 24

2.13. Payer partners were represented across nearly all PCF regions..... 26

3.1. The PCF payment model replaces the Medicare fee schedule with a population-based approach..... 30

3.2. Example of a quarter 3 2022 payment for a risk group 1 practice..... 31

3.3. PBPs decreased for Cohort 1 practices when the PAA was applied in Q3 2022 (risk group 1 only)..... 32

3.4. PAAs were highest for risk group 1 practices..... 34

3.5. Per-beneficiary FVF payments were highest for higher risk group practices 37

3.6. Most Cohort 1 practices received a positive PBA in 2022 38

3.7. Variance in practice-level PBAs from April to October 2022..... 38

3.8. PCF payments were higher than payments would have been under FFS 40

3.9. The difference between PCF payments and FFS payments is larger in higher risk groups..... 41

3.10. Two payers offered a payment approach closely aligned with CMS 44

3.11. Lack of practice participation was the most common barrier to offering alternative to FFS payments 45

3.12. Cohort 1 practices were much more likely to access CCLF data than Cohort 2 practices 48

4.1. Participating practices are required to implement several PCF care delivery interventions..... 54

4.2. Causal pathways and other primary care functions and activities illustrate how PCF practice activities might affect key outcomes 55

4.3. More than 70 percent of PCF practices reported making changes to care delivery activities across seven areas of primary care..... 56

4.4. Most PCF practices made changes to care delivery activities in care management..... 56

4.5. More than two-thirds of PCF practices made care delivery changes to address patients’ health-related social needs..... 57

4.6. Many PCF practices made care delivery changes related to other primary care functions and activities, such as patient and caregiver engagement and education..... 58

4.7. Most practices reported it has been challenging to reduce hospitalizations or costs during their first year of PCF participation 61

4.8. Most practices reported feeling they had achieved additional goals during their first year of PCF participation. 62

5.1. Hypothesized effect of longitudinal care management on health outcomes 70

5.2. Hypothesized effect of episodic care management on health outcomes..... 74

5.3. Hypothesized effect of behavioral health integration on health outcomes..... 79

Table of Contents

5.4.	Hypothesized effect of addressing health-related social needs on health outcomes	80
5.5.	Hypothesized effect of specialty care coordination on health outcomes.....	83
5.6.	Practice activities in other primary care functions.....	85
5.7.	Estimated percentage impact of PCF on eight leading indicators associated with one or more of five main primary care activities.....	92
6.1.	We estimated impacts of PCF on two primary and three secondary outcomes.....	95
6.2.	We estimated impacts of PCF across three practice subgroups.....	96
6.3.	PCF did not change acute hospitalizations and increased Medicare Part A and B expenditures over the first two performance years	98
6.4.	We find limited evidence that PCF led to changes in secondary outcomes for Medicare FFS beneficiaries over the first two performance years.....	100
6.5.	PCF and comparison practices had similar pre-intervention trends for primary-care-substitutable ED visits, but visits increased faster during the model for PCF practices.....	101
6.6.	There is a high probability of meaningful increases in total Medicare Part A and B expenditures, primary-care-substitutable ED visits, and potentially preventable ED visits.....	102
6.7.	Hybrid frequentist-Bayesian results suggest little variation in impacts across practice subgroups in Performance Year 1.....	103
7.1.	PCF logic model design and key findings.....	105
7.2.	In 2020, before PCF’s launch, Cohort 1 PCF practices had similar levels of spending and acute hospitalizations as CPC+ participants.....	108
A.1.4.1.	Schedule for annual PCF Practice Portal data collection.....	A.2
A.1.4.2.	PCF Practice Portal data analysis sample sizes and response rates, by PY and cohort.....	A.3
A.1.4.3.	Definitions and data sources for PY 1 key practice characteristics subgroup analysis	A.4
A.1.5.1	Portal questions used to identify practices with planned or implemented changes to longitudinal care management, episodic care management, or comprehensive and coordination	A.7
A.1.5.2.	Some practices were eligible for inclusion in multiple samples because they were pursuing more than one key strategy to reduce acute hospitalizations	A.9
A.1.5.3.	Number of practices in care delivery sample frame and sample by sample group and strata.....	A.10
A.1.5.4.	Comparison of practices selected for care delivery interviews with all practices participating in PCF.....	A.11

A.1.5.5. Proposed distribution of practices for payment interviews..... A.12

A.1.6.1. Number of practices in larger health care organizations based on PCF application data..... A.14

A.1.6.2. Number of practices in larger health care organization based on PCF application data..... A.15

A.1.6.3. Number of practices in larger health care organization based on OneKey data A.16

A.1.6.4. Comparison of system-affiliation results from PCF application data versus the OneKey database..... A.17

A.1.6.5. Concordance in the number of practices in a larger health care delivery organization..... A.17

A.1.6.6. Concordance in the number of practices in a health care system A.17

A.1.6.7. Number and percentage of health care delivery organizations with practices in PCF..... A.19

A.1.6.8. Number and characteristics of parent organizations interviewed, from November 2022 to March 2023..... A.20

A.2.1.1. Lookback periods used in attribution..... A.25

A.2.1.2. Primary care services eligible for attribution A.26

A.2.1.3. Practitioner primary care specialty codes A.27

A.2.1.4. Similarities and differences between beneficiary attribution methods for payment and evaluation..... A.30

A.2.1.5. Overlap between beneficiaries attributed to PCF Cohort 1 and 2 practices for the evaluation and those attributed for payment A.33

A.2.2.1. Practice inclusions and sample sizes..... A.35

A.2.4.1. PQI and IQI flags for potentially preventable ED visits..... A.44

A.2.4.2. Diagnostic categories, medication classes, and exclusion criteria A.45

A.2.4.3. High-risk medication drug classes..... A.46

A.2.4.4. CPT and HCPCS codes to identify behavioral health visits in ambulatory settings..... A.48

A.2.4.5. NPPES behavioral health specialist taxonomy codes..... A.49

A.2.5.1. The sample of PCF practices in the impact evaluation A.51

A.2.5.2. Cohort 1 post-matching balance on characteristics and outcomes..... A.54

A.2.5.3. Cohort 2 post-matching balance on characteristics and outcomes..... A.63

A.2.5.4. CPC+ alumni post-matching balance on high priority characteristics and outcomes..... A.72

A.2.5.5. Non-CPC+ alumni post-matching balance on high priority characteristics and outcomes..... A.74

A.2.5.6. Distribution of PCF practices across PCF regions and their average travel time (in minutes) to matched comparison practices in each region..... A.76

A.2.6.1. Population covered under the cross-sectional study design A.77

A.2.6.2. Beneficiary control variables for the analysis of Medicare claims-based outcomes..... A.82

A.2.6.3. Practice characteristics included in the analysis of Medicare claims-based outcomes A.84

A.2.6.4. Practice subgroups A.86

A.2.7.1. Health policy interventions included in the PCF literature review..... A.89

A.2.7.2. Prior distributions used in the hybrid Bayesian analysis A.90

B.1.1. Partnership details..... B.1

B.1.2. Alternative payments B.2

B.1.3. Payments to reward performance..... B.4

B.1.4. Care management fees B.5

B.1.5. Non-financial supports..... B.6

B.1.6. List of PCF payer partners, by payer type..... B.8

B.1.7. Payer practice penetration by region B.9

B.2.1. Numbers and proportions of primary care practices that participated in and/or applied to PCF in 2021 or 2022, by PCF region B.10

B.2.2. Characteristics of Medicare fee-for-service beneficiaries and primary care practices in PCF and non-PCF regions, before the start of PCF..... B.12

B.2.3. Characteristics of primary care practices in PCF regions, before the start of PCF B.13

B.2.4. Community characteristics of the practice and beneficiaries in PCF regions, before the start of PCF..... B.14

B.2.5. Characteristics of Medicare fee-for-service beneficiaries in PCF regions, 2020 B.15

B.2.6. Characteristics of Cohort 1 PCF practices by risk group, in 2020 B.17

B.2.7. Characteristics of Cohort 2 PCF practices by risk group, 2021 B.19

B.2.8. Characteristics of Medicare fee-for-service beneficiaries assigned to Cohort 1 PCF practices by risk group, in 2020 B.21

B.2.9. Characteristics of Medicare fee-for-service beneficiaries assigned to Cohort 2 PCF practices by risk group, in 2020 B.23

B.2.10. Characteristics of PCF practices (Cohorts 1 and 2) and their assigned Medicare fee-for-service beneficiaries by prior CPC+ participation, before the start of PCF..... B.25

Table of Contents

B.2.11.	Practice characteristics of PCF practices that withdrew from the model compared to those that did not, before the start of PCF.....	B.27
B.2.12.	Beneficiary characteristics of PCF practices that withdrew from the model compared to those that did not.....	B.28
B.2.13.	Counts and rates of practices that withdrew from the model, by risk group.....	B.30
B.2.14.	Reasons for practice withdraws in 2022, by PCF risk group.....	B.31
B.3.1.	Baseline acute care utilization among beneficiaries assigned to PCF practices.....	B.34
B.3.2.	Proportion of baseline disparities in acute care explained by disparities in potentially preventable acute hospitalizations.....	B.35
B.3.3.	Proportion of baseline disparities in acute care explained by disparities in non-emergent or primary-care-substitutable outpatient ED visits.....	B.36
B.4.1.	Services included in the PCF professional population-based payment, flat visit fee, and payment accuracy adjustment for attributed Medicare beneficiaries.....	B.37
B.4.2.	Annual population-based payments in 2022 by risk group and cohort.....	B.39
B.4.3.	2022 population-based payments for Cohort 1 practices, by risk group.....	B.40
B.4.4.	2022 per-provider population-based payments for Cohort 1 practices, by risk group.....	B.40
B.4.5.	Performance-based adjustment results for Cohort 1 practices by risk group, ownership type, practice size and urbanicity in 2022.....	B.42
B.4.6.	PBA percentage for Cohort 1 practices by risk group, ownership type, practice size and urbanicity in 2022.....	B.43
B.4.7.	PBA results by quarter for Cohort 1 practices in 2022.....	B.44
B.4.8.	PBA churn for Cohort 1 practice in 2022 (Sankey Diagram).....	B.44
B.4.9.	Average annual PCF payments in 2022, by cohort.....	B.45
B.5.1.	Quality Gateway measures and benchmarks for performance year 2021.....	B.46
B.5.2.	Percentage (and number) of PCF Cohort 1 practices that achieved benchmark for Quality Gateway measures in 2021.....	B.47
B.6.1.	Timing of the PCF Practice Portal reporting.....	B.48
B.7.1.	Overall frequencies for PCF Practice Portal items in Performance Year 1 Care delivery items.....	B.70
B.7.2.	General Model items.....	B.85
B.7.3.	Summary of PCF practices' reported care delivery changes in Performance Year 1.....	B.98

Table of Contents

B.7.4.	Care delivery changes practices reported making during their first year of participation in PCF, by risk group	B.99
B.7.5.	Care delivery changes practices reported making during their first year of participation in PCF, by CPC+ participation status	B.101
B.7.6.	Care delivery changes practices reported making during their first year of participation in PCF, by practice size	B.103
B.7.7.	Care delivery changes practices reported making during their first year of participation in PCF, by practice affiliation.....	B.105
B.7.8.	Care delivery changes practices reported making during their first year of participation in PCF, by cohort.....	B.107
B.7.9.	Care delivery changes practices reported making during their first year of participation in PCF, by Medicare Shared Savings Program ACO participation status.....	B.109
B.7.10.	Care delivery changes practices reported making during their first year of participation in PCF, by practice's SVI quartile.....	B.111
B.7.11.	Comparison of practices' reported confidence in their ability to reduce acute hospitalizations and/or total cost of care at baseline with how challenging practices reported it has been to reduce hospitalizations and/or costs during their first year of PCF participation.....	B.113
B.8.1.	Practices' main strategies to reduce acute hospitalizations, total cost of care, or both during their first year of participation in PCF	B.114
B.9.1.	Overall frequencies for PCF Practice Portal items at baseline Care delivery items.....	B.115
B.10.1.	Overall frequencies for PCF Practice Portal items in PY2, Cohort 1 only Care delivery items	B.120
B.11.1.	Percentage of practices in risk groups 1 and 2 that reported making changes in each of three care delivery functions as their main strategy for reducing acute hospitalizations during their first year of participation in PCF, by primary care function and in total	B.134
B.12.1.	Percentage of PCF practices that reported having a physician PCF lead or champion	B.140
B.12.2.	Percentage of PCF practices with a physician champion that reported their physician lead was knowledgeable about PCF advanced primary care functions, actively incorporated PCF advanced primary care functions into regular use, and provided leadership to practice staff in PCF implementation.....	B.141
B.12.3.	Percentage of practices that reported having a physician involved in implementing PCF	B.142
B.12.4.	Characteristics of physicians who are engaged versus not engaged in PCF implementation	B.143

Table of Contents

B.13.1.	Sensitivity tests and motivation for inclusion.....	B.146
B.13.2.	Comparison of main results for Medicare Part A and B expenditures with the results from tests for the influence of outliers and alternative levels of clustering.....	B.147
B.14.1.	Estimated impacts of PCF on eight leading indicators associated with the PCF practices' main primary care activities.....	B.148
B.14.2.	Impacts on acute hospitalizations (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup.....	B.150
B.14.3.	Impacts on Medicare Part A and B expenditures (\$ per beneficiary per month) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup	B.151
B.14.4.	Impacts on primary-care-substitutable ED visits (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup	B.152
B.14.5.	Impacts on potentially preventable ED visits (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup	B.153
B.14.6.	Impacts on proportion of inpatient discharges with unplanned 30-day readmission for Medicare FFS beneficiaries over first two performance years, by practice subgroup	B.154
B.14.7.	Regression-adjusted means and impacts on primary outcomes for Medicare FFS beneficiaries over the first two performance years.....	B.155
B.14.8.	Regression-adjusted means and impacts on secondary outcomes for Medicare FFS beneficiaries over the first two performance years.....	B.156
B.14.9.	Regression-adjusted means and impacts on acute hospitalizations (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup	B.157
B.14.10.	Regression-adjusted means and impacts on total Part A and B Medicare expenditures (\$ per beneficiary per month) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup.....	B.159
B.14.11.	Regression-adjusted means and impacts on primary-care-substitutable ED visits (per 1,000 beneficiaries per year) over the first two performance years, by practice subgroup ...	B.161
B.14.12.	Regression-adjusted means and impacts on potentially preventable ED visits (per 1,000 beneficiaries per year) over the first two performance years, by practice subgroup.....	B.163
B.14.13.	Regression-adjusted means and impacts on proportion of inpatient discharges with unplanned 30-day readmission over the first two performance years, by practice subgroup.....	B.165
B.14.14.	Hybrid frequentist-Bayesian impact estimates for primary outcomes over the first two performance years	B.167

B.14.15. Hybrid frequentist-Bayesian impact estimates for secondary outcomes over the first two performance years.....	B.168
B.14.16. Impacts on acute hospitalizations (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup.....	B.169
B.14.17. Impacts on Medicare Part A and B expenditures (\$ per beneficiary per month) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup	B.170
B.14.18. Impacts on primary-care-substitutable ED visits (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over first two performance years, by practice subgroup	B.171
B.14.19. Impacts on potentially preventable ED visits (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over first two performance years, by practice subgroup	B.172
B.14.20. Impacts on proportion of inpatient discharges with unplanned 30-day readmission for Medicare FFS beneficiaries over first two performance years, by practice subgroup	B.173
B.14.21. Hybrid Bayesian results for practice subgroups in Performance Year 2	B.174

Executive summary

The Centers for Medicare & Medicaid Services (CMS) Innovation Center launched the Primary Care First (PCF) Model to continue efforts from previous models that aim to advance primary care in the United States. The goals of PCF are to improve care for Medicare fee-for-service (FFS) beneficiaries and to lower costs for CMS. The model was open to primary care practices in 26 regions across the United States, and practices could join in two cohorts: one starting in 2021 and the other in 2022. PCF offers capitated payments (referred to as population-based payments, or PBP) along with visit-based payments (referred to as flat visit fees, or FVF), with the opportunity for substantial performance-based adjustments (PBAs) to total primary care payments if practices meet targets for acute hospitalizations or total cost of care and select quality metrics for their attributed Medicare FFS patients. The PBP is also subject to the payment accuracy adjustment (PAA), which is based on the number of certain primary care services that attributed beneficiaries received outside the practice as a percentage of all qualifying services. The independent evaluation of PCF aims to determine whether the model meets these goals.

In this second annual report, the evaluation team analyzes the implementation experiences of Cohort 1 and Cohort 2 practices and other payers participating in the PCF Model and estimates the preliminary impact of the PCF Model on acute hospitalizations and Medicare Part A and B expenditures relative to a comparison group. We also estimate impacts on a set of seven leading indicators identified to provide an early signal of whether care delivery changes are resulting in meaningful early outcome changes as well as a set of secondary outcomes that PCF is hypothesized to affect. We present preliminary impact estimates because (1) we did not anticipate finding improvements for these outcomes early in the model and (2) we are updating our comparison group for future analyses. Future reports will include an expanded set of secondary outcomes and a finalized comparison group.



Key takeaways and implications

Key takeaways from the second annual report

PCF Goal 1: Recruit practices and payer partners to participate in the model

- At the start of 2022, nearly 3,000 PCF practices were participating in the model. They were generally larger than non-participating practices in their regions, often affiliated with health systems or other participating PCF Model practices, had experience in an advanced alternative payment model, and served relatively healthy, affluent patients.
- By the end of 2022, 27 percent of Cohort 1 practices (226 practices) and 10 percent of Cohort 2 practices (231 practices) had withdrawn from the model. Frustration with the PAA and a desire to join Accountable Care Organization Realizing Equity, Access, and Community Health (ACO REACH) Model were the top reasons for withdrawals.

PCF Goal 2: Recruit payers to partner in and align with PCF

- Payer participation was limited in most PCF regions in 2022 in terms of the number of payers that partnered in PCF and the number of contracts that payers had in place with practices.
- Only about half of PCF payer partners were providing PCF-aligned payment supports to practices, which include both an alternative to FFS payment and a PBA to payment.

PCF Goal 3: Provide payments, learning supports, and data tools to PCF practices

- CMS' PCF payments, including reductions from the PAA, were more generous on average than FFS payments, but most practices felt payments were inadequate to implement their planned care delivery changes.
- Two-thirds of Cohort 1 practices earned a positive PBA from CMS in 2022, but this adjustment did not offset the downward effect of the PAA on practices' payments, which was, on average, three times higher than the PBA.

PCF Goal 4: Promote patient-centered care delivery

- Practices in risk groups 1 and 2 reported pursuing reductions in acute hospitalizations through longitudinal and episodic care management. Practices also made changes related to comprehensiveness and coordination, including integrating behavioral health, addressing health-related social needs, and coordinating care with medical specialists. Practices in risk groups 3 and 4 likewise built on existing strategies that spanned all five of the primary care functions to care for patients with complex needs.
- Practices reported benefitting from being part of a larger parent organization and having experience measuring performance under value-based contracts when implementing care delivery changes.

-
- Practices anticipated that the changes they were making could reduce acute hospital utilization and total per-capita cost of care, but there is limited evidence the reported changes in care delivery have improved outcomes, relative to outcomes at other similar primary care practices.

PCF Goal 5: Reduce acute hospital utilization and total cost of care, and improve quality of care and patients' experience

- PCF did not meaningfully reduce acute hospitalizations and increased total Medicare Part A and B expenditures (including model payments) by around 1.5 percent.

Implications from the second evaluation report for PCF and future models

- Many practices joined PCF with prior practice transformation experience, potentially limiting the impact of the model on Medicare expenditures, service use, and quality of care outcomes. In other words, many practices made significant care delivery changes before joining PCF, especially in the context of Comprehensive Primary Care Plus (CPC+) implementation. As a result, practices' baseline performance might have been better than average, limiting their room for improvement under PCF.

Although PCF was designed as a practice site-level intervention, the heavy presence in PCF of parent organizations, such as health systems, limited individual practices' latitude to change care delivery and reduced clinicians' exposure to model incentives. Future interventions could more explicitly acknowledge the role of parent organizations and consider assessing model impacts at the parent organization level.

- The timing of the PAA, which started 18 months into model participation, contributed to Cohort 1 practices' perception of PAA as a penalty instead of a recoupment of Medicare overpayments for primary care services that had been reimbursed twice: both covered under the PBP and paid at the full FFS rate to non-PCF providers that furnished the services. It is possible that estimating the adjustment and applying it to PCF payments from the start of PCF would have improved the perception of the PAA because it would not have been seen as a loss and improvements could have been seen instead as a bonus by the practices.
-

A Closer Look at PCF Key Takeaways



Characteristics of practices participating in PCF and the payers partnering with CMS

At the start of 2022, nearly 3,000 PCF practices were participating in the model. They were generally larger than non-participating practices in their regions, were often affiliated with health systems or other PCF practices, had experience in value-based care, and served relatively healthy, affluent patients.

Participants trended toward larger practices. In

fact, more than one-third of Cohort 1 practices and nearly half of Cohort 2 practices had 10 or more practitioners, and less than one-quarter of practices had one or two practitioners in both

cohorts. On average, non-participating practices had two fewer practitioners compared to PCF practices. PCF practices tended to be affiliated with a parent organization, with more than 80 percent of practices affiliated with a hospital or other health care delivery organization, and less than 20 percent were independent. In addition, most PCF practices from both cohorts had prior transformation experience before joining PCF: two-thirds of practices had participated in an advanced alternative payment model, and about half participated in the Medicare Shared Savings Program. Cohort 2 practices had more transformation experience than Cohort 1 practices, partly because 60 percent had previously participated in CPC+. PCF required model applicants to have experience with value-based payment arrangements or payments based on cost, quality, or utilization performance. PCF practices served a relatively healthy Medicare FFS population and a disproportionate share of White beneficiaries. PCF beneficiaries also lived in communities with higher household incomes, lower unemployment and poverty rates, and lower social vulnerability than the national average. Still, there were racial and socioeconomic disparities in acute care use within practices before PCF's launch, suggesting there is room for the model to influence disparities within PCF in the future. The highest rates of inpatient and emergency department (ED) use were among beneficiaries who were Black, dually eligible for Medicare and Medicaid, eligible for the Part D low-income subsidy, or residing in an area with high social vulnerability.

Payer participation continued to be limited in most PCF regions in 2022 in terms of the number of payers partnering in PCF and the number of contracts that payers had in place with practices, despite the increase in the number of participating payers as practices with CPC+ experience joined in Cohort 2.

The 23 payer partners, representing 24 regions, that were participating at the start of 2022 offered a range of commercial Medicaid Managed Care, Health Insurance Marketplace, and Medicare Advantage products, and more than half had previously partnered with CMS in CPC+. Most payer partners had a limited number of contracts with PCF practices in place, however, because of uneven participation of PCF practices in the regions. The number of payer partners remained low

By the end of 2022, 27 percent of Cohort 1 practices and 10 percent of Cohort 2 practices had withdrawn from the model.

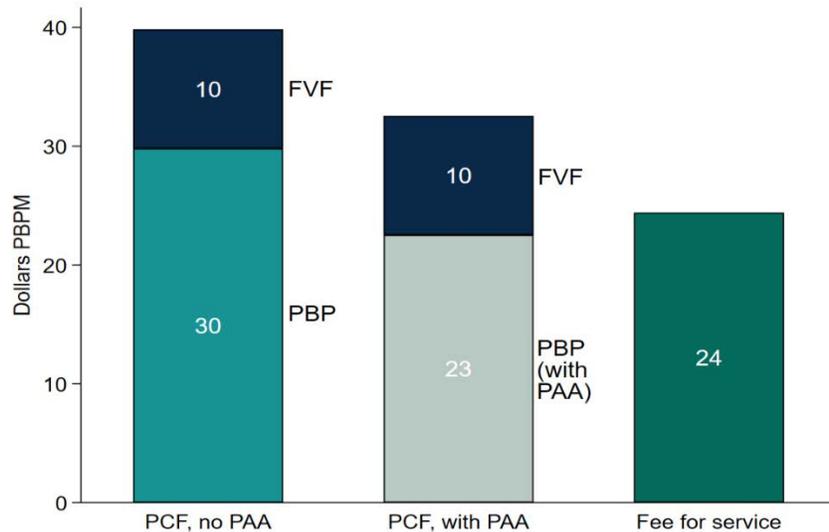
Concerns with the PAA was the main reason for Cohort 1 withdrawals, and joining the ACO REACH Model was the main reason for most Cohort 2 withdrawals. The PAA did not affect Cohort 2 practices until 2023, likely leading to the smaller percentage reporting this as a reason for withdrawal.

compared with CPC+, which ended with 45 payer partners in 14 regions. Most payer partners said that multi-payer collaboration was a significant motivator for joining PCF, but low rates of payer partnership meant there were few opportunities for regional multi-payer collaboration.

\$ Payments and supports practices receive and how practices experience them

Analyses show that PCF payments were more generous on average than FFS payments, but most practices felt payments were inadequate to implement their planned care delivery changes. For a defined set of primary care practices, CMS payments to Cohort 2 practices were about one-third larger under the PCF payment model than under FFS (including an estimate of the PAA) (Exhibit ES.1.). This aligns with similar findings for Cohort 1 practices in the evaluation’s first annual report (Conwell et al. 2022). Despite this finding, roughly 60 percent of all practices as of the end of their first year of participation reported that PCF payments were less than adequate to support changes to better manage the care of patients. Former CPC+ practices were especially likely to perceive PCF payments as inadequate, and many regarded CPC+ as a more generous payment model. In some cases, practices reported having to reduce their care management staffing because of this perceived shortfall in funding.

Exhibit ES.1. PCF payments were higher than payments would have been under FFS



Source: Mathematica’s analysis using 2019 Medicare carrier claims data.

Notes: We calculated means across all risk groups and weighted them by the number of attributed beneficiaries. Payments are geographically and MIPS adjusted.

FFS = fee for service; FVF = flat visit fee; MIPS = Merit-based Incentive Payment System; PAA = payment accuracy adjustment; PBP = population-based payment; PBPM = per beneficiary per month; PCF = Primary Care First.

Two-thirds of Cohort 1 practices earned a positive PBA in 2022, but this adjustment did not offset the downward effect of the PAA on practices’ PBPs, which was much more significant.

Once each adjustment was introduced, PBAs increased Cohort 1 practices’ quarterly total primary care payments by 7 percent on average, or \$14,477; the PAA decreased Cohort 1 practices’ PBPs by 34

percent on average, or \$42,998. The increase in payment from the PBA was relatively modest, especially considering that practices could earn a maximum of a 50-percent positive adjustment.

Practices characterized the methodology used to calculate the PAA as unfair and in conflict with their goals to provide patients greater access to health care. CMS designed the PAA to avoid paying twice for the same service, once through PBP to the PCF practice and once through FFS payment at another primary care practice. Practices noted frustration that the PAA included patients' accessing care within the parent organization but outside of their attributed primary care practices, such as at an urgent care or walk-in clinic. In addition, practices saw the PAA as unfair because many visits with nurse practitioners who provide specialty care counted as primary care visits and could contribute to the PAA. Partly because of these concerns, the PAA was the main reason for Cohort 1 practices withdrawing from the model. Despite these concerns, most practices did not plan to change their care delivery to attempt to lower the PAA and, to some extent, believed visits contributing to the adjustment were inevitable.

Half of PCF payer partners provided PCF-aligned payment supports to practices, which include an alternative to FFS payment and a PBA. Nearly all the payer partners that provided a PCF-aligned payment model used their existing internal or state-based payment model, and very few payers had moved further away from FFS because of their PCF partnership. Payers' most commonly reported challenges to introducing PCF-aligned payment approaches were insufficient practice participation in the model and a perceived lack of practice willingness and readiness to accept capitated payments.



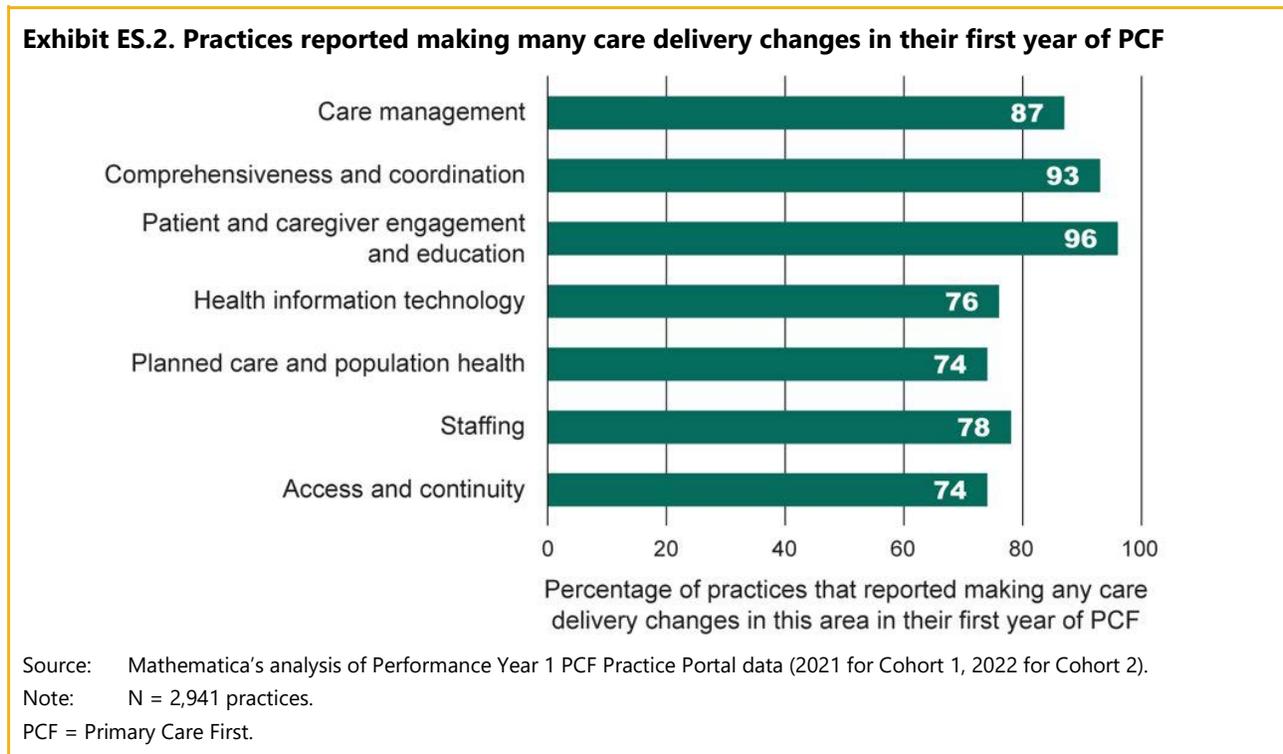
Practices' approaches to implementing care delivery changes under PCF

Building on previous primary care models, PCF emphasizes five comprehensive primary care functions: access and continuity, care management, comprehensiveness and coordination, patient and caregiver engagement, and planned care and population health. Model participants must agree to meet a limited set of care delivery requirements within these five functions, but they otherwise have flexibility in how they pursue strategies to achieve the model outcomes.

Practices in risk groups 1 and 2 reported pursuing reductions in acute hospitalizations through longitudinal and episodic care management (see Exhibit ES.2). Practices also made changes related to comprehensiveness and coordination, including integrating behavioral health, addressing health-related social needs, and coordinating care with medical specialists. They reported implementing activities in the model's other three primary functions (access and continuity, patient and caregiver engagement, and planned care and population health) to support improvements in outcomes. Many practices noted that they had already started work focused on these care functions under previous value-based payment programs, including CPC+.

Practices in risk groups 3 and 4 continued to build on their more individualized, holistic, and comprehensive approach to care for patients with complex needs, modifying existing activities spanning all five of the model's primary care functions. A larger share of risk group 3 and 4 practices than risk group 1 and 2 practices consistently reported making changes for most care delivery activities. These changes focused on improving population health, expanding access to care, enhancing

care management, improving comprehensiveness and coordination of care, and patient education and engagement.



Practices reported in interviews that they benefitted from being part of a larger parent organization and having experience measuring performance under value-based contracts when implementing care delivery changes. Being part of a larger parent organization allowed practices access to staff such as care managers, pharmacists, and behavioral health workers and to more advanced electronic health record systems and staffing support to use data effectively. Previous value-based payment arrangements like CPC+ prepared practices for the care delivery changes they reported making for PCF in 2022. This is because the goals and incentives of other value-based payment programs largely aligned with PCF.

Practices faced challenges hiring and retaining enough staff, such as care managers and behavioral health staff, to implement their care delivery changes as planned. Many of these challenges stemmed from workforce supply shortages in the community that were exacerbated by COVID-19 and, for some practices, an inability to compete with the higher salaries that larger health care organizations offered.

Practices anticipated the changes they were making could reduce acute hospital utilization (for risk groups 1 and 2) and total per-capita cost of care (for risk groups 3 and 4), but there is limited evidence the reported changes in care delivery have improved outcomes relative to outcomes at other similar primary care practices. To quantitatively assess the early effects of the changes in care delivery that Cohort 1 practices had made by the end of their second year of participation in the model—and that Cohort 2 practices had made by the end of their first year of participation—we estimated impacts through 2022 on a set of seven leading indicators. We identified these leading

indicators to provide an early signal of whether the care delivery changes described by the practices are resulting in meaningful early outcome changes (for example, greater use of transitional care services or behavioral health services and greater rates of primary care follow-up after an acute care event). One might expect to see improvement in the selected leading indicators if the model is eventually to lower acute hospitalizations and total per-capita cost of care, at least when compared with similar practices not participating in PCF. Compared with a group of primary care practices that were similar to the PCF practices when PCF began, there was a small and statistically significant estimated impact for three of the seven leading indicators. Two of the effects were associated with longitudinal care management: an increase in adherence to medications for chronic conditions and a decrease in use of high-risk medications. The third effect was a decrease in billable post-discharge visits in Year 1. Because we observe billable services only in claims data, we cannot determine whether practices increased or decreased the number of nonbillable services for follow-up care delivered during this period.

There are several potential reasons for the lack of movement on these early indicators. First, most of the changes that practices made represented minor modifications to existing care delivery activities initiated before joining PCF, and further improvement in short-term outcomes might be difficult to achieve early in the model. In addition, PCF practices might have changed their care delivery for reasons other than participating in PCF. If comparison practices (which do not participate in PCF) are making similar changes, we will not detect the effects of PCF participation relative to non-participants, even if the care delivery changes themselves are helpful. Finally, making meaningful changes in patients' and practitioners' behavior takes time and might take longer to produce meaningful improvements even in early indicators.



Preliminary impact estimates of the PCF Model on outcomes

We estimated preliminary impacts of PCF on the model's two main outcomes—acute hospitalization utilization and total Medicare expenditures—and three secondary outcomes—primary-care-substitutable ED visits, potentially avoidable ED visits, and 30-day readmissions.

PCF increased total Medicare Parts A and B expenditures (including model payments) by around 1.5 percent and did not meaningfully reduce acute hospitalizations or readmissions. The estimated probability that total Medicare expenditures increased was more than 99 percent in the first performance year (2021 for Cohort 1 and 2022 for Cohort 2) and the second (2022 for Cohort 1 only). The increase in Medicare expenditures is consistent with findings mentioned earlier: that PCF payments are more generous than FFS. We did not anticipate detecting many improvements in claims-based outcomes after only two years of model participation for Cohort 1 practices and one year for Cohort 2 practices. In fact, CMS anticipated PCF could result in detectable cost savings to Medicare by Performance Year 4. Practice transformation is a complex process and likely to take time to translate into improved outcomes, especially because we are estimating incremental impacts of the model relative to comparisons that resemble PCF practices when the model began. This aligns with data submitted to CMS in which more than 90 percent of PCF practices reported that it has been somewhat or very challenging to reduce acute hospitalizations or total cost of care.

Relative to the comparison group, there was about a 3 percent increase in primary care substitutable ED visits among Cohort 1 PCF practices in Performance Year 2. However, we have no qualitative evidence that PCF practices made changes that led to the observed increase. In addition, these estimates cover only Cohort 1, which represents about one quarter of PCF practices. We did not find meaningful differences in the other secondary outcomes.



Looking forward

Future evaluation reports will contain an expanded impact evaluation, assessing in greater detail PCF's effects on Medicare expenditures, service use, and quality of care outcomes. The evaluation will more fully integrate those findings with descriptive and impact analyses using claims data, data reported by practices through the CMS portal, and qualitative results drawn from interviews with practices and payers. We will refine our comparison group and expand our analyses to include another year of data, additional secondary outcomes, sensitivity tests, and beneficiary subgroups. We will also add analyses to better understand the effects of practice attrition and the relationship between the practice PBAs and their outcomes. Future evaluation reports will also contain findings from interviews with practices that focus on the trajectory of practice transformation after three years in PCF and deepen our understanding of practices' perception of the PCF payment model as well as interviews with high-performing practices about factors driving their success. To complement the interview data, we will use portal data to examine changes over time in responses to questions that have been in all rounds of portal data and cover new and expanded topics, including behavioral health integration, strategic decision making, perceptions of model payments, and advancing health equity. And, lastly, we will report analyses of practice survey data recently collected about their efforts to enhance their provision of longitudinal care management and behavioral health integration and about the role of PCF in motivating and funding care delivery changes.

1. Introduction

A. Overview of the Primary Care First Model

In 2021, the Centers for Medicare & Medicaid Services' (CMS) Center for Medicare & Medicaid Innovation (Innovation Center) launched the Primary Care First (PCF) Model to test whether financial risk and performance-based payments for outcomes for already advanced primary care practices will reduce total Medicare fee-for-service (FFS) expenditures and improve patients' health outcomes. CMS designed PCF as a multi-payer model in which Medicare Advantage plans, commercial health insurers, state Medicaid agencies, and Medicaid managed care plans commit to aligning with PCF's payment methodology to increase the reach of the model and help achieve a critical mass of aligned support to drive practice-level transformation. Practices could join the model in 2021 (Cohort 1) or 2022 (Cohort 2) and needed to meet eligibility criteria for participation. Each cohort has a five-year period of performance.

The PCF Model builds on principles and lessons from past Innovation Center models, such as the Comprehensive Primary Care Initiative (CPC Classic) and Comprehensive Primary Care Plus (CPC+). CPC Classic showed some beneficial effects such as reducing the rates of outpatient emergency department (ED) visits and hospitalizations but did not reduce Medicare spending enough to cover care management fees (Peikes et al. 2018). CPC+, the successor to CPC Classic, ended in 2021 and introduced multiple tracks to engage practices at different levels of transformation with stronger incentives, and it included 3,070 practices in 18 regions with more than 14,000 primary care clinicians providing care to more than 17 million patients. An independent evaluation estimated CPC+ led to modest reductions in ED visits, hospitalizations, and acute inpatient expenditures and improvement on some claims-based quality-of-care measures (O'Malley et. al 2023). Various stakeholders raised concerns, however, that CPC+ relied too heavily on specific requirements for practice transformation and traditional Medicare FFS billing, doing too little to reduce the billing and quality reporting burdens on primary care practices and to shift clinicians' focus to outcomes of care. The PCF Model addresses these concerns by offering advanced primary care practices a flexible model focused on outcomes rather than processes and increased reimbursement for practices that care for medically complex patients.

CMS anticipates that PCF's new payment approach based on prospective population-based payments (PBPs) and Flat Visit Fees (FVFs) for face-to-face encounters will encourage PCF practices to promote access to visit-based and non-visit-based primary care services, resulting in care delivery changes that will reduce acute care utilization and lower Medicare Part A and Part B spending. The PBP is based on the total number of Medicare FFS beneficiaries attributed to each practice and ranges from \$28 to \$175 per beneficiary per month, depending on the average acuity of attributed beneficiaries. CMS intends for the PBP to support the many elements of primary care not effectively compensated by Medicare FFS, such as round-the-clock access, non-face-to-face encounters, coordinated and comprehensive care, and in-depth patient engagement (Berenson and Rich 2010).

CMS hypothesized that the FVF supports the clinician–patient contacts that patients value (O’Malley et al. 2015; Ghany et al. 2018). The FVF replaces the FFS evaluation and management (E&M) reimbursement and is paid when attributed beneficiaries have an office visit. The FVF is \$40.82 before geographic adjustments, which is lower than a typical E&M visit. CMS anticipates this visit-based revenue, combined with the PBP, would approximate the overall reimbursement that these practices historically would have received under Medicare FFS for practices whose beneficiary panel have an average risk based on the Hierarchical Condition Category (HCC) scores, though it would be somewhat higher for practices with a higher-risk beneficiary panel (CMS 2019).

Attribution and PCF risk groups

CMS created four risk groups based on practices’ average Hierarchical Condition Category risk score for attributed beneficiaries. Attribution is determined hierarchically based on voluntary attestation by beneficiaries, where beneficiaries have received select services such as their most recent Annual Wellness Visit, or the plurality of their eligible primary care visits. The PBP is lowest for risk group 1 and highest for risk group 4 to compensate practices for the resources required to treat more complex patients.

The PCF payments are subject to two adjustments: 1) a payment accuracy adjustment (PAA) to account for primary care services furnished outside the attributed practice and 2) a performance-based adjustment (PBA) based on the practice’s performance on utilization, total costs, and quality. The PAA started in the third quarter of the second Performance Year (PY) and is applied to the practice’s PBP. The quarterly PBP started in the second quarter of the second PY and in mid-2022, Cohort 1 practices were subject to their first PBA. A practice’s PBA is based on performance relative to a peer group and the practice’s improvement over time. The PBA can increase the highest-performing practices’ total primary care payment by up to 50 percent and reduce the lowest-performing practices’ payments by up to 10 percent.

Exhibit 1.1 summarizes the goals, eligibility criteria, payment, and options for data that practices receive from CMS (and possibly other payers) for PCF practices.

Exhibit 1.1. Goals, practice eligibility criteria, payment, and data-sharing options for PCF



Practice eligibility criteria **Beneficiary eligibility criteria**

- 
- Practices must:
- Be ready to deliver advanced primary care (as measured by PCF application questions).
 - Be located in one of 26 PCF regions.
 - Have primary care practitioners certified in internal medicine, general medicine, geriatric medicine, family medicine, and hospice and palliative medicine.
 - Have at least 125 attributed Medicare FFS beneficiaries
 - Have primary care services that are at least 50 percent of billing based on revenue.
 - Use 2015 CEHRT, be able to exchange health information with other providers and systems, and connect to a regional health information exchange.

- 
- Beneficiaries must:
- Be enrolled in Medicare Part A and B and not enrolled in a Medicare Advantage or other Medicare health plan.
 - Have Medicare as their primary payer.
 - Be alive at the start of the quarter in which they are attributed.
 - Not have end-stage renal disease or be enrolled in hospice, in a long-term institution, or incarcerated.
 - Not be aligned or attributed to an entity participating in any other program or model that includes a Medicare FFS shared savings opportunity, except for the Medicare Shared Savings Program.

Payment



Practices receive a total primary care payment comprising a quarterly prospective risk-adjusted population-based payment and Flat Visit Fees. Beginning in the second quarter of the second performance year, a quarterly performance-based adjustment adjusts payments upward and downward based on performance on measures of acute hospitalizations, Medicare expenditures, quality of care, and patient experience. Starting in the third quarter of the second performance, a performance-based adjustment is applied to account for services covered under the population-based payment but furnished outside of the beneficiary's attributed practice.

Payer-provided data

- 
- CMS provides all participants with a data feedback tool and access to claim and claim line feeds with Medicare expenditure and utilization data at the practice and beneficiary levels.
 - Practices can receive data aggregated across CMS, other PCF-participating payers, or both.
 - Practices can incorporate claims data into their own analytic tools.

CMS' criteria for attributing beneficiaries to practices^a



Source: Mathematica's summary of the PCF request-for-applications and payment methodology.

^a The impact evaluation uses a different attribution approach because we cannot account for voluntary alignment in assigning beneficiaries to comparison practices. Instead, this approach involves the place beneficiaries had their most recent Annual Wellness Visits or, in the absence of such visits, the plurality of eligible primary care visits and chronic care management claims.

CEHRT = certified electronic health record technology; CMS = Centers for Medicare & Medicaid Services; FFS = fee for service; HCC = Hierarchical Condition Category; PCF = Primary Care First.

B. PCF evaluation goals for the second annual report

The goal of the independent evaluation of PCF is to determine whether the model leads to better care for Medicare FFS beneficiaries and lower costs for CMS.

In this second annual report, the evaluation team analyzes the implementation experiences of Cohort 1 and Cohort 2 practices and other payers participating in the PCF Model and estimates the preliminary impact of the PCF model on acute hospitalizations and Medicare Part A and B expenditures relative to a comparison group. We also estimate impacts on secondary outcomes that PCF is hypothesized to affect, including ED utilization and readmissions and process measures such as medication adherence. We present preliminary impact estimates because (1) we are updating our comparison group for future reports and (2) we did not anticipate finding improvements for these outcomes early in the model. Future reports will include an expanded set of secondary outcomes and a finalized comparison group.

C. Logic model and causal pathways guiding the evaluation

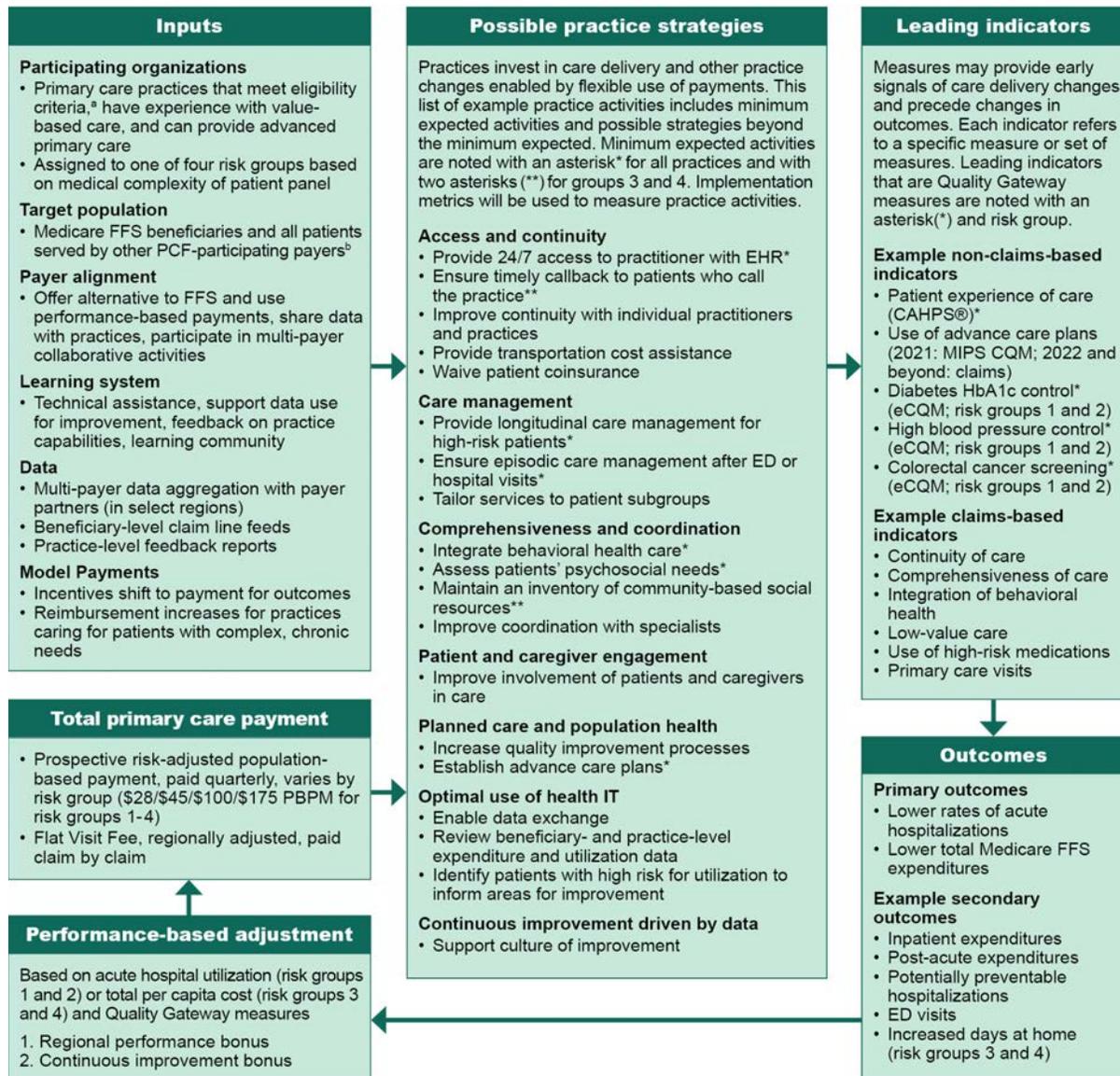
The evaluation uses a logic model to present the conceptualized relationship between the inputs, care delivery strategies, leading indicators, and outcomes of the intervention. Causal pathways represent hypotheses of strategies we anticipate practices might undertake and how these strategies might impact outcomes. We use a mixed-methods approach that relies on primary and secondary data to develop and refine the PCF logic model and the causal pathways.

1. Use of the PCF logic model to illustrate how the PCF model aims to achieve intended outcomes

The PCF logic model that Mathematica developed (Exhibit 1.2) illustrates how the PCF Model aims to achieve the desired outcomes of fewer hospitalizations and lower Medicare Part A and B expenditures. Inputs for the PCF model include participating practices and their attributed Medicare FFS beneficiaries, multi payer alignment, learning system support, and data provided to practices. Participating practices receive a total primary care payment that is adjusted through the PBA and PAA and can be reinvested as an input in the logic model. The flexibility of the PCF Model also means that practices are likely to use different care delivery approaches; the logic model reflects this by aligning the strategies that practices are likely to take with one or more of the five comprehensive primary care functions defined by CMS: care management, access and continuity, coordination and collaboration, patient and caregiver engagement, or planned care and population health (CMS 2021). In addition, practices can take advantage of the model's flexible use of payments to invest in strategies that support care delivery such as optimal use of health information technology (health IT) and continuous process improvement driven by data.

The logic model includes implementation metrics to measure activities supporting practice strategies and leading indicators to provide early signals of changes in care delivery. The implementation metrics identify the changes the practices report making, and the leading indicators are measures that might be more responsive in the short-term to the care delivery changes practices made. These signals could precede changes in the primary outcomes (acute hospitalizations and total Medicare Part A and B expenditures) or secondary outcomes such as inpatient expenditures, post-acute care expenditures, and ED visits.

Exhibit 1.2. PCF logic model



Notes: Quality Gateway refers to the measures used to inform performance-based adjustments and assess quality of care delivered. Contextual factors include geographic region, urbanicity, participation in CPC+ (2022 cohort), practice size, health system affiliation, share of patients who are Medicare FFS beneficiaries, payer involvement in PCF, structure of payer alternative payments, socioeconomic status of patient population, population utilization and per-capita costs at start of model, and changes because of the COVID-19 pandemic.

^a The eligibility criteria is as follows: located in 1 of 26 PCF regions; has at least 125 attributed Medicare beneficiaries or is able to reach a minimum number of beneficiaries within one year of model participation; primary care services are at least 50 percent of billing based on revenue (could change); uses 2015 CEHRT, supports data exchange, and connects to regional HIE.

^b Inclusion of commercial payer members dependent on degree of payer participation

CAHPS = Consumer Assessment of Healthcare Providers and Systems; CEHRT = certified electronic health record technology; CPC+ = Comprehensive Primary Care Plus; eCQM = electronic clinical quality measure; ED = emergency department; EHR = electronic health record; FFS = fee for service; HIE = health information exchange; HIT = health information technology; MIPS CQM = Merit-based Incentive Payment System clinical quality measure; PBPM = per beneficiary per month; PCF = Primary Care First.

Contextual factors might also affect the elements in the logic model and influence the relationships among them. Contextual factors could include practice-level factors such as practice size, health system affiliation, the share of patients who are Medicare FFS beneficiaries, and the socioeconomic status of the practice’s attributed Medicare population. Contextual factors might also be specific to geographic region, such as regional payer involvement in PCF, regional population utilization, and per-capita Medicare spending at the start of model. Other important contextual events to consider will be national events with broad impacts on care delivery and health outcomes such as the COVID-19 pandemic. The logic model is subject to change throughout the model.

2. Use of causal pathways to guide evaluation findings for the Second Annual Report

Causal pathways are a tool to describe practice care delivery activities and identify potential mechanisms of change in desired outcomes. The pathways that frame our evaluation findings map to two of the five primary care functions: 1) care management and 2) comprehensiveness and coordination. Evaluation findings from the first round of data collection,

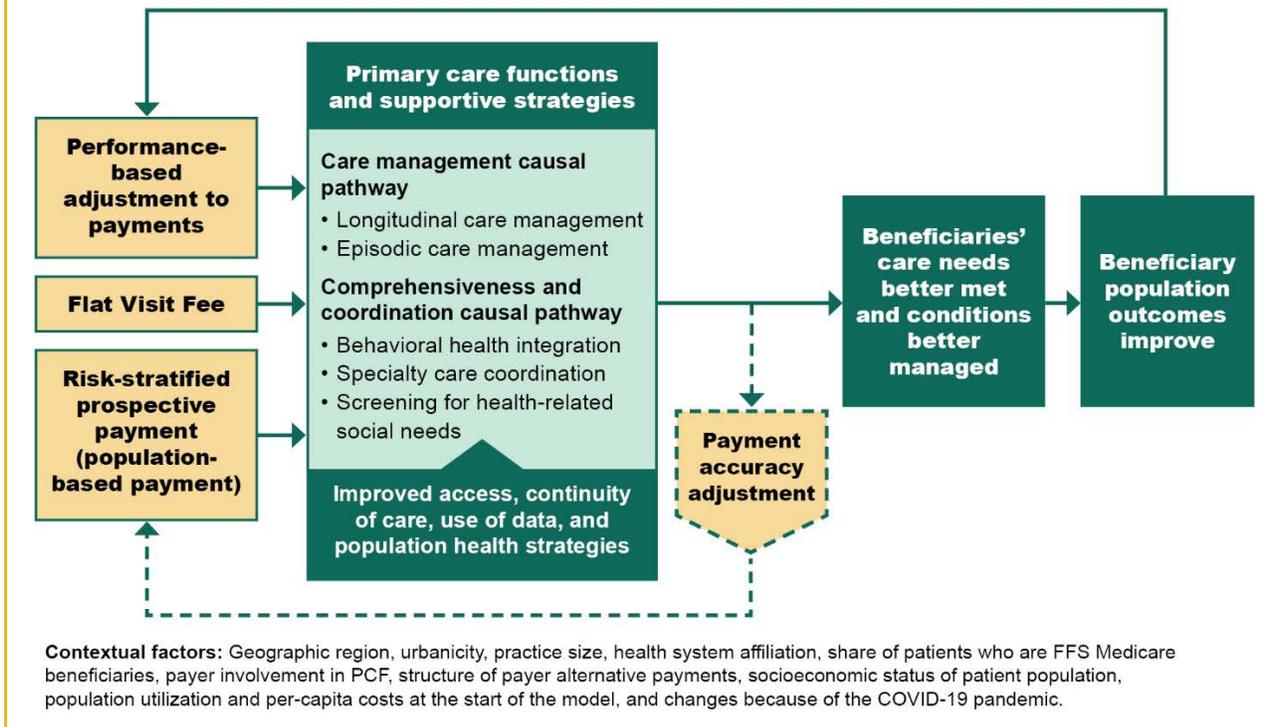
Exhibit 1.3. Relationship between primary care functions and causal pathways

Primary care function	Causal pathway
Care management	Episodic care management Longitudinal care management
Comprehensiveness and coordination	Behavioral health integration Screening for health-related social needs Specialty care coordination

described in our first evaluation report (Conwell et. al. 2022), highlighted the importance of these two primary care functions and five associated practice activities: episodic care management, longitudinal care management, behavioral health integration, health-related social needs screening, and specialty care coordination (Exhibit 1.3). Activities associated with the other three primary care functions (access to and continuity of care, greater use of data and health IT to manage and coordinate care, and adoption of strategies to improve population health) generally provide support for practices as they focus on care management and comprehensiveness and coordination.

In this evaluation report, we hypothesize how changes in the five activities that fall under the two primary care functions of care management and comprehensiveness and coordination, with support from other activities practices pursued, might result in changes in acute hospitalizations and Medicare Part A and B spending. Exhibit 1.4 provides a high-level causal pathway for how we hypothesize changes may occur.

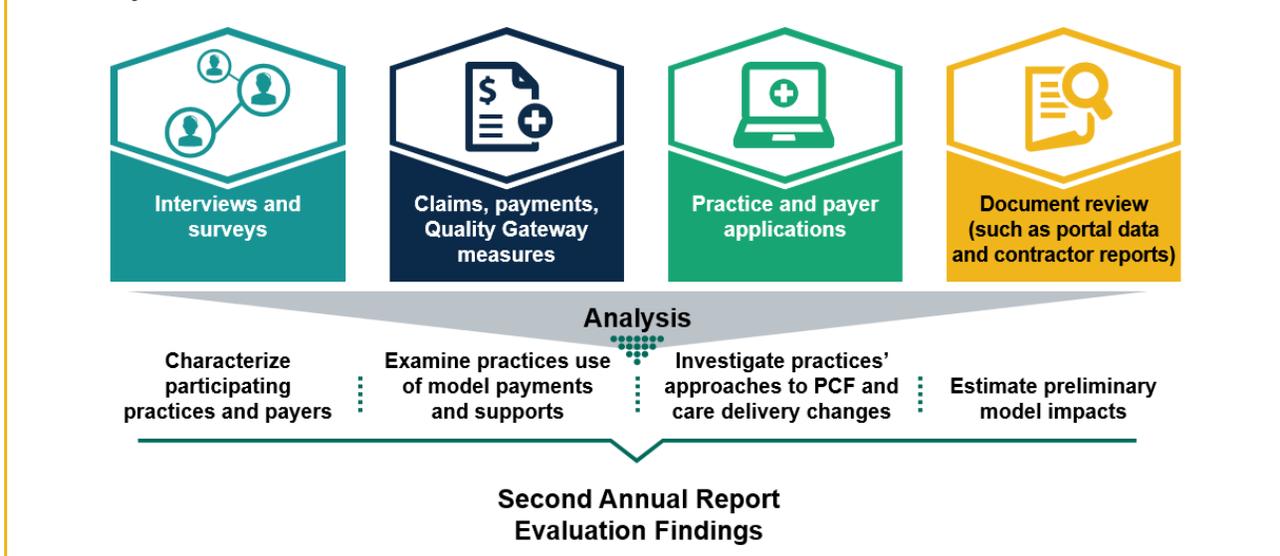
Exhibit 1.4. High-level PCF causal pathway for improving patient care



D. Organization of the report

This second annual report relies on a mixed-methods approach to analyze primary and secondary data to describe the participating practices and their experiences through the second Performance Year of the PCF Model and to estimate preliminary impacts of the model on Medicare FFS expenditures and service use, including acute hospitalizations (Exhibit 1.5).

Exhibit 1.5. Our evaluation of the second Performance Year of the PCF Model relied on primary and secondary data sources



In the chapters that follow, we describe the characteristics of practices and payers participating in the model (Chapter 2) and the model incentives and supports and how practices use them (Chapter 3). We then describe how practices approach PCF overall (Chapter 4) and take a deep dive into understanding the practices' reported changes and the facilitators and challenges to implementing them. We also examine evidence to see whether there is movement in leading indicators (Chapter 5). We then present preliminary estimates of PCF's impact on the primary outcomes of Medicare FFS expenditures and acute hospitalization utilization and on selected secondary outcomes that we hypothesize practice changes made early in the model's implementation might have affected (Chapter 6). The concluding chapter ties this information together on the implications for refining causal pathways that will guide the evaluation going forward for measuring practice transformation and model performance (Chapter 7). Exhibit 1.6 provides a road map for the report.

Exhibit 1.6. Road map to the second annual report of the PCF evaluation

Chapter	Content
1. Introduction	<ul style="list-style-type: none"> • Overview of the PCF Model, evaluation goals, logic model, causal pathways, data sources, and report organization
2. Characteristics of the practices participating in PCF and the payers partnering with CMS on PCF	<ul style="list-style-type: none"> • Which practices participate in PCF? Why do they participate in PCF? What types of beneficiaries do they serve? • Why did accepted practices choose not to participate or withdraw after participating?
3. Payments and supports practices receive and how practices experience them	<ul style="list-style-type: none"> • What are practices' perceptions of the payments from CMS and payer partners under PCF? • How do the total payments that PCF practices receive under the model differ from usual reimbursements under standard Medicare FFS? • To what extent did payer partners offer a PCF-aligned payment approach? • How does affiliation with a parent organization affect practices' financial management of PCF payments? • How frequently do practices use non-payment supports such as learning supports, data tools, and model waivers? What do practices perceive as the benefits and drawbacks of these supports?
4. Participating practices' approach to PCF during their first year of participation	<ul style="list-style-type: none"> • What care delivery changes did practices report making in their first year of PCF participation? How did these changes differ by practice type? • How challenging did practices report it has been to reduce acute hospitalizations or costs? • To what extent have PCF practices reported achieving other goals related to PCF participation?
5. Care delivery changes practices report making under PCF and evidence that practices are making progress along the causal pathways	<ul style="list-style-type: none"> • What changes did practices report making to care delivery in the second year of PCF? • What did practices report were their main strategies for reducing hospitalizations or costs? How challenging has it been for practices to achieve those goals? What other goals do practices feel they've achieved during their participation in PCF?

Chapter	Content
6. Preliminary impact estimates of the PCF model on outcomes	<ul style="list-style-type: none">• What are the estimated impacts on total FFS Medicare expenditures and acute hospitalizations among participating PCF practices relative to a matched comparison group overall and by system affiliation and CPC+ participation status?• What are the estimated impacts on 30-day readmissions and potentially preventable and primary care substitutable ED visits?
7. Conclusion	<ul style="list-style-type: none">• Next steps in the evaluation

CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; PCF = Primary Care First.

2. The characteristics of practices participating in PCF and the payers partnering with CMS



Key takeaways

- At the start of 2022, nearly 3,000 PCF practices were participating in the model in 25 of the 26 PCF regions (Alaska did not have a PCF practice).
- More than 5 percent of primary care practices nationwide participated in PCF, and PCF practices provided care to 11 percent of all Medicare FFS beneficiaries (about 2 million).
- PCF practices are larger than other primary care practices in PCF regions and more likely to be affiliated with a parent organization (and therefore less likely to be independent) and have had more prior value-based payment transformation experience. Cohort 2 practices are larger and have more transformation experience than Cohort 1 practices.
- Before the start of the model, beneficiaries in Cohort 2 practices had lower Medicare expenditures and acute care use than Cohort 1 beneficiaries. Practices that had participated in the Comprehensive Primary Care Plus (CPC+) Model had lower rates of acute hospitalizations than practices that did not.
- PCF practices serve a disproportionate share of White Medicare beneficiaries who reside in more affluent communities.
- Before the start of the model, there were disparities in potentially preventable hospitalizations and primary care substitutable emergency department use at PCF practices. For both outcomes, beneficiaries who were Black, dually eligible for Medicaid and Medicare, eligible for the Part D low-income subsidy, or residing in a socially vulnerable area had the highest use.
- By the end of 2022, 27 percent of Cohort 1 practices and 10 percent of Cohort 2 practices had withdrawn from the model. For Cohort 1, the most common reason for exit in 2022 was concerns with the payment accuracy adjustment. For Cohort 2, the most common reason was to join the Accountable Care Organization Realizing Equity, Access, and Community Health (ACO REACH) Model.
- Compared with practices that remained in the model, withdrawn practices were smaller, less likely to have prior value-based payment transformation experience, and more likely to be independent.
- There were no substantial differences in the performance-based payments between practices that withdrew from the model in 2022 compared with those that remained in PCF.
- Payer participation continues to be limited in most PCF regions in 2022, both in terms of the number of payers partnering in PCF and the number of contracts that payers have in place with practices, despite the increase in payers with CPC+ experience in Cohort 2.

A. Focus of this chapter

In this chapter, we describe participation in the PCF Model. We describe the 846 primary care practices that joined the model in Cohort 1 and the 2,228 practices that joined in Cohort 2. We also describe the communities and the Medicare fee-for-service (FFS) beneficiaries that PCF practices serve. We link beneficiaries to primary care practices based on the practice to which they were attributed in the first quarter of 2020 (see Exhibit 2.1 and Appendix A.2.2 for more details).

Exhibit 2.1. Attribution of beneficiaries to primary care practices

Attribution is linking beneficiaries to the practice that most recently provided their Annual Wellness or Welcome to Medicare visit over a two-year lookback period. If a beneficiary had neither, they are attributed to the practice they visited most frequently over that period. The PCF Model's implementation contractor gives practices a quarterly list of their attributed beneficiaries. We use a similar algorithm to attribute beneficiaries to PCF and non-participating comparison practices.

In this chapter, we focus on PCF participation and present the characteristics of non-participating primary care practices and their beneficiaries so we can understand the representativeness of PCF practices in their regions. Understanding PCF's representativeness is key to determining the generalizability of the evaluation's findings. If participating practices are unique in systematic ways, it may be difficult to understand how broadly the evaluation findings apply to non-participating practices. For example, if PCF practices are more likely to be larger and affiliated with a health care system, we cannot straightforwardly generalize the evaluation findings to smaller, independent practices. Characterizing PCF participants will also help CMS measure its progress toward having Innovation Center models that reflect the diversity of Medicare beneficiaries nationwide, which is a stated goal of CMS. Finally, this analysis might also help predict participation in future Innovation Center initiatives with similar participation requirements and incentives.

In addition to studying practices and their beneficiaries, we describe the characteristics of the PCF payer partners, their motivations for partnering, and how their payment approaches align with CMS' payment approach for PCF. Exhibit 2.2 shows the data sources used in this chapter.

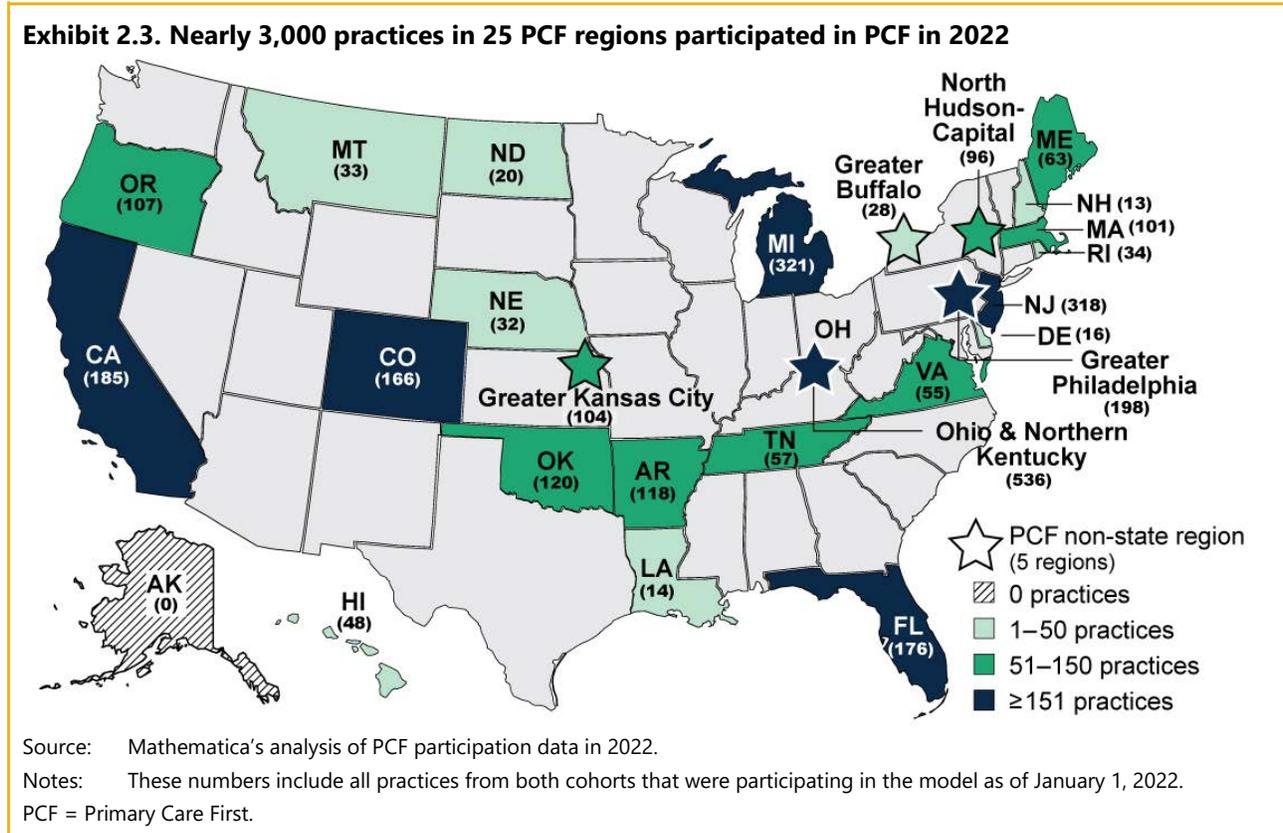
Exhibit 2.2. Data sources used in this chapter

- PCF application data from 3,860 practices
- Medicare FFS claims and enrollment data for: 822 Cohort 1 practices, 2,145 Cohort 2 practices, and 55,234 non-participating primary care practices
- OneKey data (produced by IQVIA) for practice characteristics such as count and type of providers and ownership (see Appendix A.2.2)
- Baseline PCF Portal data from 3,012 practices
- CMS withdrawal tracker and exit interviews with 10 practices
- 18 payer worksheets completed in fall 2022 and 14 interviews with PCF payer partners conducted from October 2022 to February 2023 (see Appendix A.1.1 and A.1.2)
- Interviews with 12 parent organizations

CMS = Centers for Medicare & Medicaid Services; FFS = fee for service; PCF = Primary Care First.

B. The reach of PCF nationwide and in PCF regions

In 2022, nearly 3,000 practices were participating in the PCF Model, after accounting for Cohort 1 practices that left in 2021 and an influx of new practices that joined as part of Cohort 2, many of which had formerly participated in CPC+. These PCF practices were located in 25 of the 26 PCF regions¹, which comprise the 18 CPC+ regions plus an additional eight regions (see Exhibit 2.3).



Within PCF regions, 11 percent of primary care practices participated in the model, and nearly one-quarter of Medicare FFS beneficiaries were attributed to a PCF practice, but the percentage of participating practices varied substantially across regions. For example, about 40 percent of primary care practices in the Greater Buffalo and the Greater Kansas City regions participated in PCF, but less than 6 percent of practices in Louisiana and California did so (see Exhibit B.2.1 in Appendix B.2). In terms of the national reach of PCF, more than 5 percent of primary care practices nationwide participated in PCF, and

PCF practices provided care to 11 percent of all Medicare FFS beneficiaries (about 2 million).

PCF regions were similar to other regions nationwide, in terms of characteristics of primary care practices and their Medicare FFS beneficiaries. We compared characteristics of PCF regions with those in remaining regions nationwide to understand the representativeness of the 26 regions selected

¹ Alaska had one applicant but no practices that participated in PCF.

to participate in PCF, finding that PCF and non-PCF regions were similar along most dimensions we studied (see text box below).²

Characteristics used to describe practices and their beneficiaries

- Practice characteristics include size, specialty, affiliation, select transformation experience, and rural location.
- Beneficiary characteristics include age, sex, race, poverty indicators, Hierarchical Chronic Conditions (HCC), and Medicare FFS expenditures and service use.
- Beneficiary community characteristics include median income, poverty, unemployment, and Social Vulnerability Index.

For example, a similar proportion of practices were independent (that is, not affiliated with a parent organization [see Exhibit 2.4]): 49 percent in PCF regions versus 45 percent in non-PCF regions (see Exhibit B.2.2 in Appendix B.2). Medicare FFS beneficiaries in PCF and non-PCF regions also had similar racial composition, average total Medicare expenditures, and rates of hospitalizations. The lone exception was in median household income; PCF regions had beneficiaries residing in communities with a median household income of about 6 percent higher (\$85,000 compared with \$80,000 for non-PCF regions). There were no substantive differences, however, in unemployment, poverty, or social vulnerability. (See Appendix B.2 for a detailed comparison of characteristics).

C. The characteristics of PCF practices and beneficiaries and their representativeness within PCF regions

We examined the characteristics of PCF practices and their beneficiaries in the baseline period (that is, before the start of the PCF Model)³. To understand the representativeness of PCF practices within PCF regions, we also compared their characteristics with those of non-participating primary care practices in PCF regions. We stratified all non-participating practices into two groups based on whether they applied to the PCF

Exhibit 2.4. Practice affiliation with a parent organization

We use proprietary data from IQVIA, a commercial health care data vendor that maintains a list of practices and their corporate ownership, to identify practices that are part of a health system with a hospital, part of another type of health care delivery organization, or independent.

For analyses in which we focus on PCF practices, we use PCF application data to differentiate vertically integrated systems (parent organizations that include physician practices and hospitals) from horizontally integrated networks (parent organizations exclusively comprising physician practices). Appendix A.1.6. provides more information.

PCF = Primary Care First.

² For most analyses of the characteristics of PCF practices in this chapter, our sample includes practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner (see Appendix A.2.2 for details about the population analyzed).

³ To be included in this analysis, practices had to have existed in 2020 and have at least one Medicare beneficiary and at least one primary care practitioner. We measured practice characteristics (such as practice affiliation with a parent organization) in 2020 for Cohort 1 practices and non-participating practices and in 2021 for Cohort 2 practices. We measured information on prior transformation experience in the practice, such as participation in the Medicare Shared Savings Program or an advanced alternative payment model (APM) in 2020 for all practices. We linked Medicare beneficiaries to primary care practices based on the practice to which they were attributed in the first quarter of 2020. We measured beneficiary and community characteristics in the same baseline period for all practices: 2020 in most cases (see Appendix A.2.2 for more details). When studying baseline disparities in acute care use among groups of beneficiaries in PCF practices (for example, by race and ethnicity), we assigned beneficiaries to practices using the intent-to-treat approach described in Chapter 6 and studied acute care use in 2019 for Cohort 1 and 2021 for Cohort 2, omitting 2020 due to the possibility of disparities specific to the onset of the COVID-19 pandemic.

2. The characteristics of practices participating in PCF and the payers partnering with CMS

Model: non-applicants and non-participating applicants. Then, we compared their practice, beneficiary, and community characteristics with those of PCF practices.

1. Characteristics of PCF practices, by cohort

Most PCF practices were assigned to the lowest risk group when they first joined PCF. More than 90 percent of all PCF practices were assigned to risk group 1 (2,681 out of 2,967 practices total), and less than four percent of practices in each cohort were assigned to the highest two risk groups (63 practices total) (Exhibit 2.5). The substantial proportion of practices in the bottom risk group aligns with CMS' anticipated distribution of practices before the model began.

Exhibit 2.5. Most PCF practices were assigned to the lowest risk group when they joined the model

PCF cohort	Risk group				
	1	2	3	4	Total
Total	2,681	223	47	16	2,967
Cohort 1	741	53	21	7	822
Cohort 2	1,940	170	26	9	2,145

Source: Mathematica's analysis of PCF participation data in 2021 and 2022.

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner (see Appendix A.2.2 for details on the population of practices analyzed).

PCF = Primary Care First.

Most PCF practices had at least two practitioners, were affiliated with a parent organization, and had prior value-based payment transformation experience. Cohort 2 practices were larger and had more transformation experience than Cohort 1 practices. More than one-third of Cohort 1 practices and nearly half of Cohort 2 practices were large practices with 10 or more practitioners, and less than one-quarter of practices were small practices with one or two practitioners (Exhibit 2.6). PCF practices had high levels of affiliation with a parent organization, with more than 80 percent of practices affiliated with a hospital or other healthcare delivery organization, and less than 20 percent were independent. Across both cohorts, practices in the highest risk groups (risk groups 3 and 4) had more practitioners and were more likely to be independent compared with practices in lower risk groups (see Exhibits B.2.6 and B.2.7 in Appendix B.2). Most PCF practices had some prior selected transformation experience before joining PCF: two thirds of practices had participated in an advanced APM and about half participated in the Medicare Shared Savings Program in 2020. Among Cohort 2 practices, nearly 60 percent had previously participated in CPC+. Cohort 2 practices were more likely to have participated in an advanced APM prior to joining PCF – with 94 percent of practices having participated in 2020 compared with 68 percent of Cohort 1. Further, a higher percentage of Cohort 2 practices were NCQA recognized patient centered medical homes (PCMH).

Within PCF regions, PCF practices were larger than non-participating practices and were more likely to be affiliated with a parent organization. PCF practices also had more prior transformation experience, driven by Cohort 2 practices. When comparing non-participating practices with PCF practices, non-participating practices had fewer practitioners, on average (a mean of 6 practitioners versus 8 in PCF practices) and were more likely to be independent: more than half of non-applicants and 40 percent of non-participating applicant practices were independent practices

2. The characteristics of practices participating in PCF and the payers partnering with CMS

compared with less than 20 percent of PCF practices. Non-applicant practices were less likely to have had transformation experience in 2020: for example, about half of PCF practices but only one-third of non-applicants had participated in the Medicare Shared Savings Program in 2020.⁴ Non-participating applicants were similar to PCF practices in terms of prior transformation experience (Exhibit 2.6).

Exhibit 2.6. PCF practices were large, with high rates of affiliation with a parent organization and prior transformation experience

Characteristic	PCF practices		Practices not participating in PCF	
	Cohort 1 n = 822	Cohort 2 n = 2,145	Non-participating applicants n = 893	Non-applicants n = 23,225
Practice size				
Number of practitioners (mean)	7	9	6	6
Small (1 or 2 practitioners) (%)	23%	20%	36%	47%
Medium (3 to 9 practitioners) (%)	41%	34%	33%	28%
Large (10 or more practitioners) (%)	36%	46%	31%	26%
Practice specialty				
Multispecialty (%)	38%	36%	30%	36%
Number of primary care practitioners (mean)	4	5	3	2
Practices affiliation (%)				
Part of a health system with a hospital	71%	70%	40%	29%
Part of another type of health care delivery organization	13%	13%	19%	17%
Independent	16%	17%	41%	54%
Practices with select transformation experience (%)				
PCMH with NCQA recognition	21%	28%	26%	10%
Participation in Medicare Shared Savings Program	55%	49%	51%	31%
Participation in CPC+	<1%	59%	39%	3%
Participation in an advanced APM	68%	94%	90%	69%

Source: Mathematica's analysis of OneKey data (2020 and 2021) and supplemental data (see Appendix A.2 for more details on data sources).

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Characteristics are measured before the start of PCF (2021 for all practices, except for PCF Cohort 1 practices where it is 2020). Percentages might not sum to 100 because of rounding.

CPC+ = Comprehensive Primary Care Plus; n = number of practices; NCQA = National Committee for Quality Assurance; PCF = Primary Care First; PCMH = Patient-Centered Medical Home.

2. Characteristics of beneficiaries attributed to PCF practices, by cohort

PCF practices in both cohorts, and especially in Cohort 2, served high proportions of White beneficiaries and beneficiaries who were not dually eligible for Medicaid and Medicare or eligible

⁴ We consider a practice site to have participated in an advanced APM in 2020 if one or more of its practitioners participated in 2020. Similarly, we consider a practice site to have participated in the Medicare Shared Savings Program if its organization (that is, its Tax Identification Number) participated in 2020. For CPC+, we consider a practice to have participated if the practice ever participated in the model (including in years before 2020).

2. The characteristics of practices participating in PCF and the payers partnering with CMS

for the Part D low-income subsidy. In the first quarter of 2020, about 500,000 Medicare FFS beneficiaries were attributed to Cohort 1 PCF practices, and nearly 1.5 million beneficiaries were attributed to Cohort 2 PCF practices in our analysis sample. Overall, 87 percent of these beneficiaries were White—which is higher than the national average of 83 percent—with Cohort 2 having a modestly higher proportion (87 percent compared with 84 percent in Cohort 1) (Exhibit 2.7). Further, 13 percent of Cohort 1 beneficiaries and 10 percent of Cohort 2 beneficiaries were dually eligible for Medicaid and Medicare (the national average was 13 percent). Similarly, 15 percent of Cohort 1 and 12 percent of Cohort 2 were eligible for the Part D low-income subsidy (LIS) (the national average was 15 percent). Beneficiaries in Cohort 2 were also somewhat less likely to have a chronic condition: 25 percent of Cohort 1 beneficiaries and 27 percent of Cohort 2 beneficiaries did not have a chronic condition (the national average was 26 percent). Across both cohorts, PCF practices in the highest risk groups (groups 3 and 4) had higher proportions of beneficiaries 85 years or older, were non-White, and were dually eligible for Medicare and Medicaid or LIS-eligible, compared with PCF practices in the lower risk groups (groups 1 and 2) [see Exhibits B.2.8 and B.2.9 in Appendix B.2].

When comparing PCF practices and non-applicant practices in PCF regions, PCF practices had higher percentages of White beneficiaries and beneficiaries not dually eligible for Medicare and Medicaid or Part D low-income subsidy eligible. Non-participating applicant practices, however, were similar to PCF practices along these dimensions. PCF practices had a higher proportion of beneficiaries that were non-Hispanic White compared with non-applicant practices (87 percent across the two PCF cohorts versus 81 percent for non-applicants). Further, a smaller proportion of PCF beneficiaries were dually eligible for Medicaid and Medicare compared with non-applicants (11 versus 14 percent for non-applicant practices), and a smaller proportion of PCF beneficiaries were eligible for a part D low-income subsidy (13 versus 16 percent for non-applicant practices) (Exhibit 2.7).

PCF beneficiaries lived in communities with higher median household incomes, lower unemployment and poverty rates, and lower social vulnerability. For example, the median household income in the average PCF beneficiary’s community was \$86,500 compared with \$84,300 for non-applicants and \$80,700 for non-participating applicants (see Exhibit B.2.4 in Appendix B.2).

Exhibit 2.7. Beneficiaries attributed to PCF practices were disproportionately White and less likely to be dually eligible for Medicaid and Medicare and the Part D low-income subsidy.

Characteristic	PCF practices		Practices not participating in PCF	
	Cohort 1 n = 822	Cohort 2 n = 2,145	Non-participating applicants n = 893	Non-applicants n = 23,225
Age categories (%)				
18 to 64	13%	9%	10%	10%
65 to 74	49%	51%	50%	49%
75 to 84	28%	29%	29%	30%
85 or older	10%	11%	11%	11%

2. The characteristics of practices participating in PCF and the payers partnering with CMS

Characteristic	PCF practices		Practices not participating in PCF	
	Cohort 1 n = 822	Cohort 2 n = 2,145	Non-participating applicants n = 893	Non-applicants n = 23,225
Sex (%)				
Female	58%	58%	58%	58%
Race (%)				
Non-Hispanic White	84%	87%	86%	81%
Non-Hispanic Black	6%	5%	5%	6%
Asian	3%	3%	3%	4%
Hispanic	4%	3%	3%	6%
American Indian/Alaska Native	<1%	<1%	<1%	1%
Other/unknown	2%	2%	2%	2%
Poverty indicators				
Partial or full dual eligibility (%)	13%	10%	12%	14%
Part D low-income subsidy (%)	15%	12%	14%	16%
Number of Hierarchical Condition Categories (%)				
0	25%	27%	26%	26%
1 or 2	42%	42%	42%	42%
3 or 4	19%	18%	19%	19%
5 or more	14%	12%	13%	13%
Medicare FFS expenditures (\$ per beneficiary per month)				
Total Medicare expenditures	\$919	\$859	\$867	\$924
Expenditures for acute inpatient care	\$297	\$279	\$275	\$302
Service use (annualized per 1,000 beneficiaries)				
Acute hospitalizations (short-stay acute care and critical access hospitals)	240	231	236	239
Outpatient ED visits	373	358	364	369
Primary care substitutable ED visits	131	123	126	129
Primary care visits in all settings	13,295	12,207	12,712	13,630

Source: Mathematica's analysis of Medicare FFS claims and enrollment data in 2020.

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Characteristics are measured before the start of PCF (2020 for all beneficiaries). Race and ethnicity come from the MBISG probabilities (see Appendix B.3 for further context on the MBISG approach). Percentages might not sum to 100 because of rounding.

ED = emergency department; FFS = fee for service; MBISG = Medicare Bayesian Improved Surname Geocoding; n = number of practices; PCF = Primary Care First.

When examining Medicare expenditures and acute hospital use across the two PCF cohorts, Cohort 2 practices had lower expenditures and acute hospital use than Cohort 1 practices.

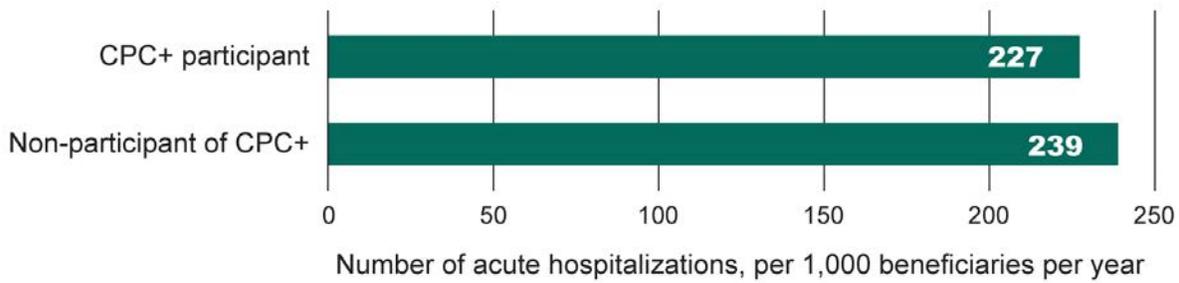
Beneficiaries attributed to Cohort 1 practices had an average of \$919 Medicare expenditures per beneficiary per month, which was about 7 percent higher than Cohort 2 practices (\$859 per month). These differences were driven, in part, by Cohort 1 beneficiaries having higher rates of acute hospitalizations than Cohort 2 beneficiaries (240 versus 231 per 1,000 beneficiaries per year—or 4 percent more) (Exhibit 2.7). Further, Cohort 1 practices were located in higher cost areas than Cohort 2 practices, on average, as measured by the CMS Medicare FFS spending price index (Exhibit B.2.4 in Appendix B.2). When comparing across risk groups, PCF practices assigned to the highest risk groups (groups 3 and 4) had substantially higher Medicare expenditures and acute care use than PCF practices in the lowest risk groups (groups 1 and 2). For example, in both cohorts, beneficiaries attributed to PCF practices in risk group 4 had about triple the expenditures than beneficiaries attributed to PCF practices in risk group 1 and more than triple the number of acute hospitalizations (see Exhibits B.2.8 and B.2.9 in Appendix B.2).

PCF practices that formerly participated in CPC+ had lower rates of acute hospitalizations than practices that did not previously participate in CPC+ (Exhibit 2.8). Previous research shows that the CPC+ model reduced acute hospitalizations (O'Malley et al. 2023). This might have enabled PCF practices that previously participated in CPC+ to start with lower baseline rates compared with practices that did not participate in CPC+. Indeed, when stratifying PCF practices based on whether they previously participated in CPC+, the rate of acute hospitalizations was 227 per 1,000 beneficiaries in 2020 for CPC+ participants versus 239 acute hospitalizations for practices that did not participate in CPC+. We found a similar pattern for Medicare expenditures, in which PCF practices that previously participated in CPC+ had lower expenditures than those that did not (Exhibit B.2.10 in Appendix B.2). Because 60 percent of Cohort 2 practices had participated in CPC+, this could help explain Cohort 2 having lower expenditures and acute hospitalizations than Cohort 1 practices. In fact, when accounting for differences in practice county location and prior CPC+ participation, the difference in expenditures between Cohort 1 and Cohort 2 is eliminated.⁵

Across all practice groups within PCF regions, Cohort 2 PCF practices had the lowest total Medicare expenditures and utilization. As we described above, Cohort 2 PCF practices had the highest rates of prior participation in transformation initiatives and might consequently have leveraged this experience to contain expenditures and acute care use for beneficiaries at their practices. For example, Cohort 2 PCF practices had total Medicare expenditures of \$859 per beneficiary per month compared with \$867 for applicants and \$924 for non-applicants (Exhibit 2.7). Similarly, Cohort 2 practices had 231 acute hospitalizations per 1,000 beneficiaries per year compared with 236 for applicants and 239 for non-applicants. This pattern holds for other service use, such as emergency department (ED) and primary care visits (Exhibit 2.7).

⁵ After regression adjusting for practices' previous CPC+ participation, the gap in beneficiaries' expenditures between cohorts narrowed from 7 percent to 3 percent (from a difference of \$61 pbpm to \$24 pbpm). Adjusting for both CPC+ participation and county eliminated any meaningful differences in beneficiaries' expenditures by cohort (the difference was reduced to less than \$2 pbpm).

Exhibit 2.8. Practices that participated in CPC+ had lower rates of acute hospitalizations



Source: Mathematica’s analysis of Medicare fee-for-service claims data in 2020.

Notes: A CPC+ participant is any primary care practice that participated in the CPC+ model for at least one calendar quarter. Among PCF practices, 1,275 participated in CPC+ and 1,692 did not.

CPC+ = Comprehensive Primary Care Plus.

3. The extent of disparities in acute care use among PCF beneficiaries before PCF

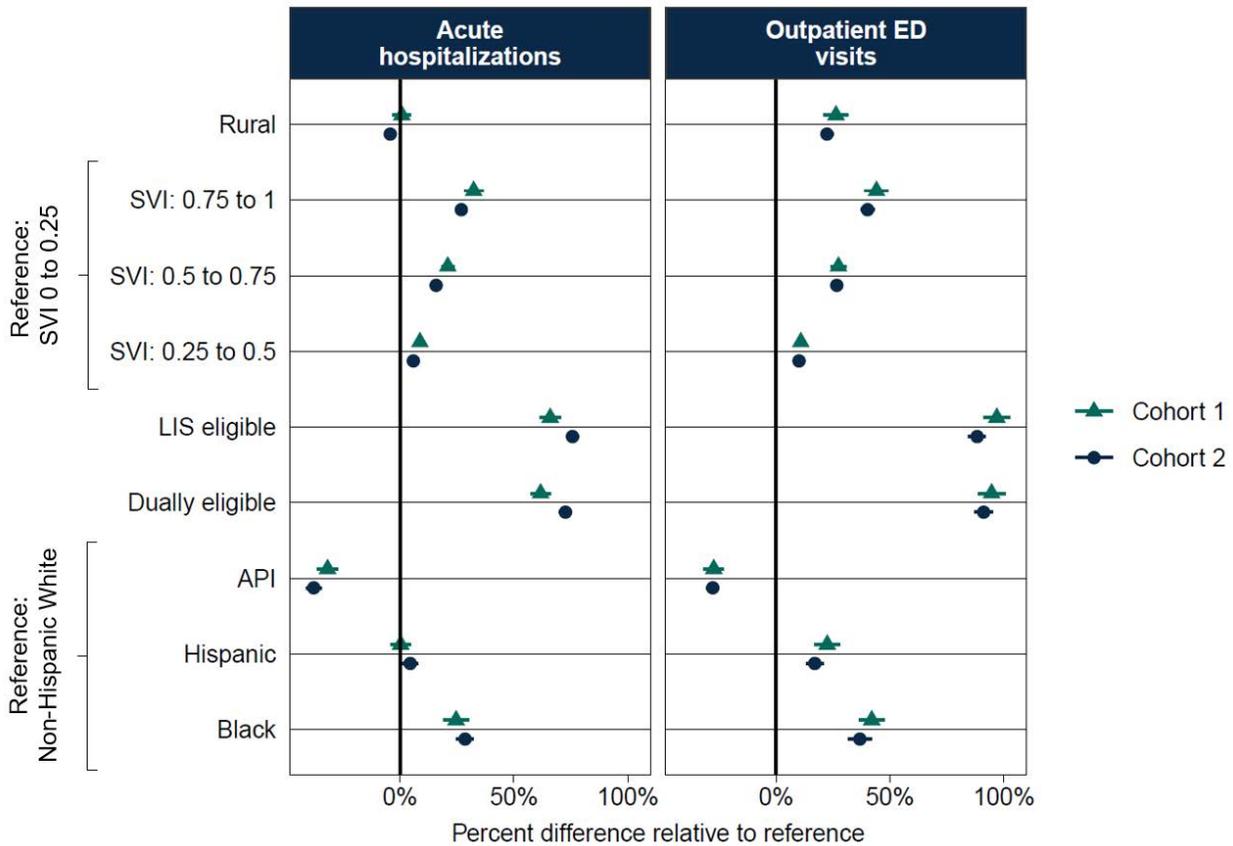
In a baseline assessment before the start of the PCF Model,⁶ PCF beneficiaries exhibited considerable disparities in acute care use, with the highest rates of inpatient and ED use among beneficiaries who were Black, dually eligible for Medicare and Medicaid, eligible for the Part D low-income subsidy, or residing in an area with high social vulnerability (see Exhibit 2.9).⁷ Beneficiaries who were Hispanic or living in a rural area had similar rates of acute hospitalizations compared with non-Hispanic White and non-rural beneficiaries, but they had higher rates of ED visits. There were equal or greater disparities in acute hospitalizations for potentially preventable conditions and in primary care substitutable ED visits, suggesting potential disparities in the quality and accessibility of primary care before PCF.

Disparities in preventable or primary care substitutable acute care use account for a substantial proportion of disparities in total acute care use. For example, disparities in potentially preventable acute hospitalizations can explain 25 to 44 percent of disparities in acute hospitalizations, and disparities in primary care substitutable visits can explain 36 to 67 percent of disparities in ED visits (depending on the beneficiary group, see Appendix B.3). Prior research suggests that primary care initiatives can have more impact on preventable or primary care substitutable acute use than on other types of acute care use (Timmins et al. 2020). If PCF improves primary care for the people most impacted by gaps in the quality and accessibility of care, the model could reduce disparities in acute care use for these PCF beneficiary groups over its course. Conversely, if any positive impacts of PCF are concentrated among beneficiaries with better outcomes at baseline, this could maintain or worsen existing disparities.

⁶ Because health disparities observed during the onset of the COVID-19 pandemic might not generalize to the intervention period, we excluded the year 2020 from this analysis (that is, the Cohort 1 and Cohort 2 analyses used data from 2019 and 2021, respectively).

⁷ Social vulnerability of beneficiaries’ residence areas was measured using the Social Vulnerability Index, released by the Centers for Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry.

Exhibit 2.9. In a baseline assessment, beneficiaries in PCF practices exhibited disparities in acute care use by race, ethnicity, socioeconomic status, and residence area



Source: Mathematica’s baseline assessment of disparities in acute care use for Medicare fee-for-service beneficiaries assigned to PCF practices in 2019 (for Cohort 1 practices) or 2021 (Cohort 2).

Notes: The comparisons shown are (from top to bottom): rural versus non-rural; higher SVI bin versus lowest SVI bin (0 to 0.25); LIS-eligible Medicare Part D beneficiaries versus Medicare Part D beneficiaries without LIS; dually eligible versus non-dually eligible; and API, Black, or Hispanic versus non-Hispanic White. Estimates of racial and ethnic disparities in acute care use were adjusted for age and sex. All other estimates were adjusted for age, sex, and race and ethnicity. Error bars depict 90% confidence intervals.

API = Asian or Pacific Islander; ED = emergency department; LIS = Low Income Subsidy (Medicare Part D); PCF = Primary Care First; SVI= Social Vulnerability Index.

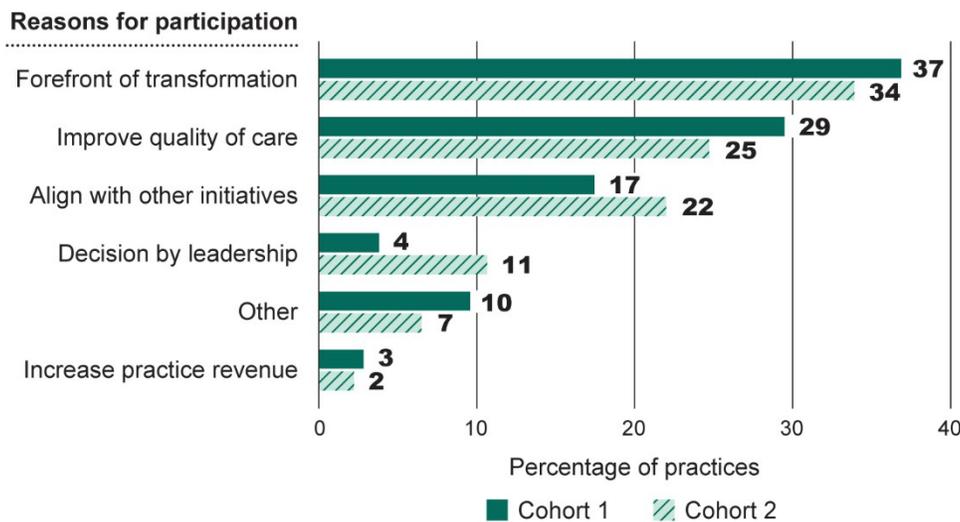
D. Reasons practices or their parent organizations chose to participate in or withdraw from PCF

Primary care practices can vary in myriad ways, such as organizational structure, financial strength, payer mix, and experience with value-based models—all factors that could influence their decision to join the PCF Model. Understanding their motivation for participating helps identify what participants hope to achieve in the model. We used portal and interview data to study the reasons PCF practices and their parent organizations chose to participate in PCF. Now, with more than two years of the model complete, some practices have withdrawn from PCF, and we also study their reasons for exiting the model as well as the characteristics of withdrawn practices.

1. Reasons practices joined PCF

Practices from both cohorts chose to participate in the PCF Model to be at the forefront of care transformation and improve quality of care. In PCF portal data, more than one-third of practices indicated that their desire to be at the forefront of transformation was the key motivator for joining the model, and more than one-quarter indicated their desire to improve the quality of patient care (Exhibit 2.10). About 20 percent of practices in each cohort reported that participation in the model aligned with other initiatives they were undertaking (Exhibit 2.10).

Exhibit 2.10. Being a leader in care transformation and improving quality of care were the top reasons for participating in PCF



Source: Mathematica’s analysis of PCF Practice Portal data completed by PCF Cohort 1 practices in March and April 2021 and Cohort 2 practices in October and November 2021.

Notes: N = 814 for this portal question for Cohort 1, and N=2,198 for this portal question for Cohort 2. We excluded one Cohort 2 practice that did not respond to this question.

PCF = Primary Care First.

2. Parent organizations’ role in PCF practice participation

Among practices affiliated with a parent organization, people at the corporate level—rather than the practice site level—often made the decision to enroll in PCF. For this reason, we interviewed parent organizations to better describe their decisions to participate in the PCF Model.⁸

⁸ We used practice application data to identify the 160 parent organizations with practices participating in PCF and recruited 12 organizations to interview that varied in the number of participating practices and affiliation type (vertically integrated system versus horizontally integrated network). We conducted hour-long virtual interviews to explore the organization’s role in PCF implementation.

Administrators from 12 parent organizations we interviewed cited multiple overlapping reasons for enrolling practices in PCF, including the following:

- Opportunity to continue work started under CPC+
- Compatibility with other performance-based contracts
- Alignment with organizational values
- Perceived financial benefits compared with FFS

These reasons largely echo practices' primary reasons for joining PCF, as reflected in portal data above (Exhibit 2.10), in which being at the forefront of transformation and alignment with other initiatives were important for practice participation.

All 12 of the parent organizations we interviewed made the decision to enroll their practices in PCF, with many soliciting input from individual practices. As one system administrator noted, "we worked as a big team collaborative to get ourselves involved. But it was a corporate decision [to participate]." Three parent organizations described moving forward without input from practices, noting that there was not a formal decision for practices to weigh in on joining because PCF felt like a natural continuation of CPC+.

All of the parent organizations had submitted applications for all eligible practices in their organization to participate in PCF, but not all practices in an organization met the eligibility requirements. About half of the parent organizations we interviewed had all of their practices participating.

3. Reasons practices withdrew from the PCF Model and characteristics of withdrawn practices

Since the start of PCF, 27 percent of Cohort 1 and 10 percent of Cohort 2 practices withdrew from the model, with the most common reason for Cohort 1 being concerns with the payment accuracy adjustments (PAAs) and for Cohort 2 to join ACO REACH. By the end of 2022, 226 Cohort 1 and 231 Cohort 2 practices withdrew from the model.^{9,10} For practices that withdrew in 2022, about 90 percent of Cohort 1 and 70 percent of Cohort 2 did so voluntarily. Specifically, among Cohort 1 practices, 42 percent of withdrawn practices did so because of concerns with the PAAs (See Exhibit 2.11). This number was significantly lower for Cohort 2 practices (7 percent), which reflects Cohort 2 having less direct experience with PAAs because it did not begin to receive them until 2023. Instead, the most common reason for Cohort 2 withdrawing was to join ACO REACH, which accounted for one-third of all Cohort 2 withdrawn practices (21 percent for Cohort 1). When we interviewed practices about their decisions to exit, we typically heard multiple reasons played a factor. For example, practices that withdrew to join ACO REACH said a combination of financial, logistical, and external factors influenced their decision.

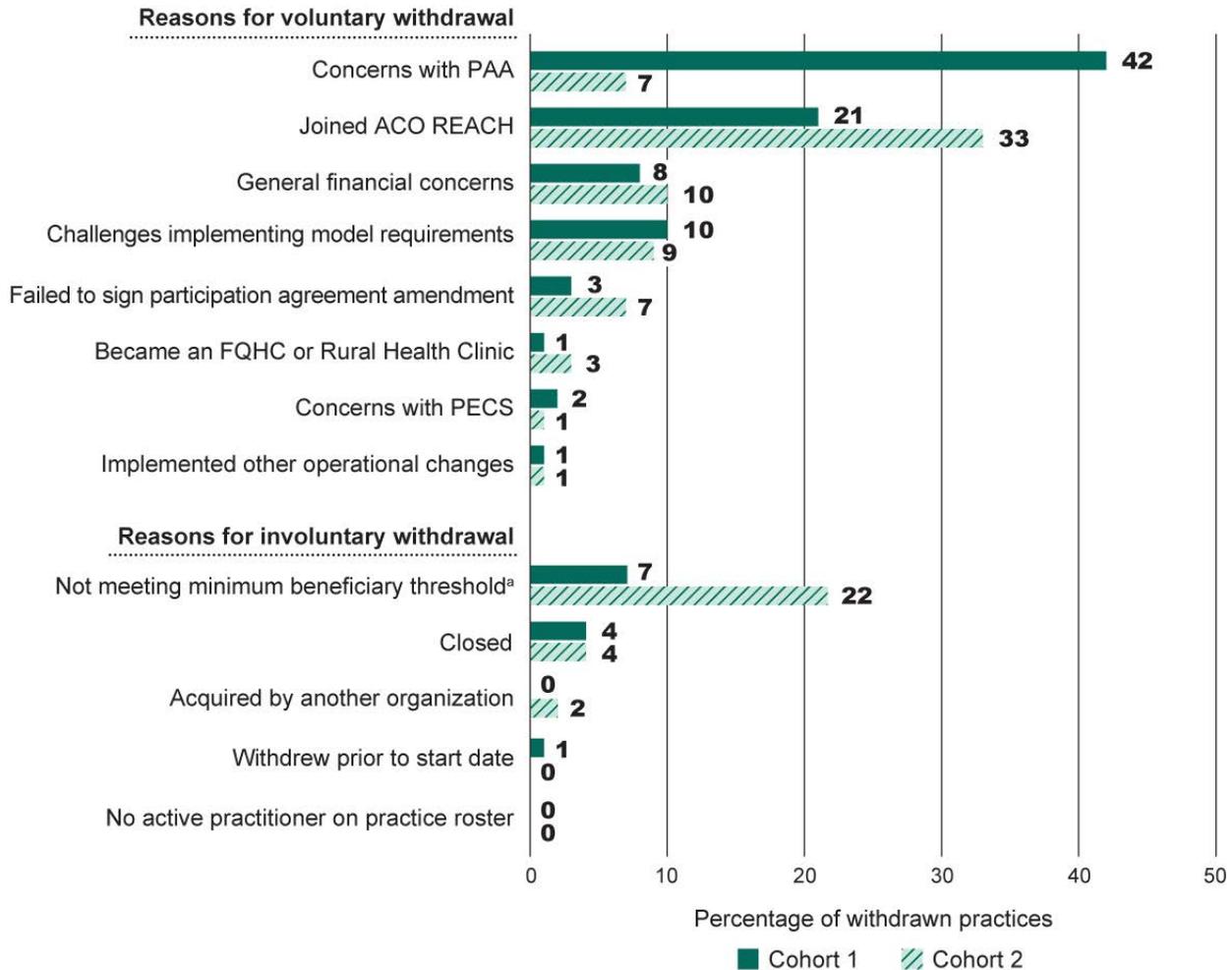
⁹ In addition, 16 practices in Cohort 1 and 41 practices in Cohort 2 merged with other PCF practices. Practitioners from merged practices are still considered to be participating in the PCF Model, as part of the practices they merged with, so they are not included in the counts of withdrawals.

¹⁰ At the start of 2023, there were 610 Cohort 1 and 1,967 Cohort 2 practices that continued to participate in PCF, which includes 17 PCF practices that split from other PCF practices (6 in Cohort 1 and 11 in Cohort 2) and were still participating in the model.

2. The characteristics of practices participating in PCF and the payers partnering with CMS

Although not as sizeable as the voluntary withdrawals, the most common reason for practices to involuntarily exit the model in 2022 was that they did not meet the minimum beneficiary threshold, which accounted for 22 percent of all Cohort 2 withdrawals and 7 percent of Cohort 1 withdrawals. Practice closures also played a role, particularly for Cohort 1, for which more than one-third of involuntary withdrawals (4 percent overall) were because of closures (See Exhibit 2.11).¹¹

Exhibit 2.11. Concerns with the PAAs for Cohort 1 and joining ACO REACH for Cohort 2 were the most common reasons for withdrawals in 2022



Source: Mathematica’s analysis of PCF Model Practice Roster provided by the implementation contractor, January 2023.

Notes: There were a total of 113 Cohort 1 and 231 Cohort 2 withdrawn practices that we analyzed from the roster data. For Cohort 1, about 90 percent of practices withdrew for voluntary reasons (99 practices). For Cohort 2, about 70 percent of practices voluntarily withdrew (167 practices).

^a Some of the practices not meeting the minimum beneficiary threshold might have also withdrawn because of non-compliance with the participation agreement.

ACO REACH = Accountable Care Organization Realizing Equity, Access, and Community Health; FQHC = Federally Qualified Health Center; PAA = payment accuracy adjustment; PCF = Primary Care First; PECS = Patient Experience of Care Survey.

¹¹ This analysis excludes practices that merged with other PCF practices because their practitioners are still considered to be participating in the model, as part of the practices they merged with.

There were no substantial differences in the payment accuracy or performance-based adjustments (PBAs) between practices that withdrew from the model and those that remained.

For example, the rates of PAAs for Cohort 1 practices were 33 percent for both withdrawn practices and those that remained (Exhibit 2.12). Similarly, Cohort 1 practices that withdrew had, on average, a 6 percent positive PBA (as a percentage of total payments) compared with 7 percent positive PBA for practices that remained, which is not a substantial difference.¹²

Exhibit 2.12. There were no substantial differences in the payment accuracy or performance-based adjustments between withdrawn practices and those that remained in PCF

Characteristic	Cohort 1		Cohort 2	
	Withdrawn	Not withdrawn	Withdrawn	Not withdrawn
Rate of PAAs (mean)	33%	33%	n.a.	n.a.
Rate of PBAs (mean)	6%	7%	n.a.	n.a.
Population-based payments (mean)	\$35,018	\$57,076	\$46,644	\$61,903
Rate of PAAs (median)	38%	31%	n.a.	n.a.
Rate of PBAs (median)	0%	0%	n.a.	n.a.
Population-based payments (median)	\$23,379	\$38,258	26,717	\$44,825

Source: Mathematica’s analysis of 2022 PCF payment data to Cohort 1 and 2.

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Sample sizes are as follows: Cohort 1 withdrawn (212) versus not withdrawn (610), and Cohort 2 withdrawn (210) versus not withdrawn (1,935). Cohort 2 practices did not receive a PBA or PAA in 2022 because these adjustments take effect in the second performance year.

n.a. = not applicable; PAA = payment accuracy adjustment; PBA = performance-based adjustment; PCF = Primary Care First.

Compared with those that remained in the model, withdrawn practices were smaller, less likely to have prior transformation, and more likely to be independent. Withdrawn practices also served more vulnerable beneficiaries, such as those that were dually eligible for Medicare and Medicaid, Part D low-income subsidy eligible, and non-White (Exhibits B.2.11 and B.2.12 in Appendix B.2). Withdrawn practices had lower population-based payments (PBPs) than practices that remained in the model because they tended to serve fewer Medicare FFS beneficiaries (Exhibit 2.12). Further, a larger share of practices in the highest risk groups (groups 3 and 4) withdrew compared with practices in the lower risk groups—practices in the higher risk groups had higher proportions of withdraws due to joining ACO REACH and not meeting the minimum beneficiary threshold but lower proportions of withdraw due to concerns with the PAA (Exhibits B.2.13 and B.2.14 in Appendix B.2).

E. Payer partnerships

The participation of payers other than CMS is an important tenet of the PCF Model. As with its other primary care transformation models, CMS encouraged other payers—including commercial insurers, Medicaid agencies, and Medicare Advantage and Health Insurance Marketplace plans—to develop a PCF-style payment model to encourage broader primary care transformation. CMS anticipated that such a payer partnership would align payment approaches, allowing practices to improve quality and reduce expenditures. CMS sees multi-payer participation as allowing practices to serve more patients under an aligned payment approach, in turn affording them the ability to transform care across their entire

¹² PBA and PAA data for Cohort 2 practices did not exist in 2022, but we will analyze them for 2023 in the next annual report.

2. The characteristics of practices participating in PCF and the payers partnering with CMS

patient panel, beyond Medicare FFS beneficiaries. Payer partners in both cohorts signed a memorandum of understanding (MOU) with CMS committing to (1) provide financial incentives, including an alternative to the FFS payment methodology and performance-based payments; (2) share data with practices to support continuous quality improvement; (3) align quality measures; and (4) align approach to care delivery capabilities. The commitments in the MOU informed the development of the Primary Care First Multi-Payer Alignment Principles, which serves as the framework for a rubric used to score payer partner proposed degree of alignment (see text box).

Primary Care First Multi-payer alignment principles

- Move away from fee-for-service payment mechanism.
- Reward outcomes, not process.
- Deliver meaningful, actionable data reports to drive practice accountability and performance improvement.
- Multi-payer alignment is critical for driving adoption of value-based care models.

Source: Centers for Medicare & Medicaid Services Primary Care First Payer Alignment Rubric.

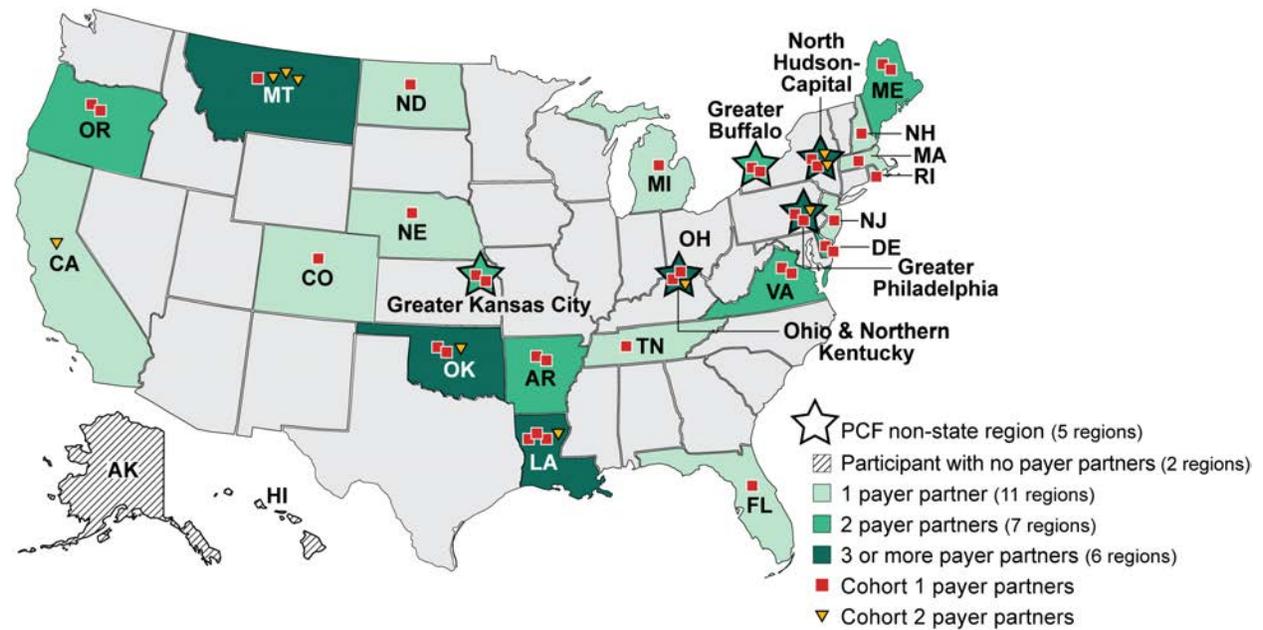
Payer partners can differ in their specific payment methodologies as long as the methodologies align with the PCF Multi-Payer Alignment Principles. Payers' payment approaches should promote consistent value-based incentives across a practice's entire patient population and reduce administrative burden from working with multiple payers, in turn allowing more practice resources to be directed into patient care.

In the remainder of this chapter, we describe the characteristics of PCF payer partners, their motivations for partnering and their perceptions of multi-payer collaboration, and payer approaches to contracting with practices. Our findings draw from interviews and surveys with 18 payer partners, PCF payer partner applications, and communication with CMS.

1. Regional payer participation in PCF

Nearly all PCF regions had at least one payer partner, but, in most regions, the partner was a single national payer that had limited engagement with the model, which limited the extent of payer partnership and collaboration through the end of 2022. There were payer partners in 24 of the 26 PCF regions at the end of 2022, with Hawaii and Alaska being the only regions that did not have a payer partner (Exhibit 2.13). In all, 85 percent of regions had a single regional payer (that is, a payer that only operates in that region) participating. Two national payers partnered in multiple regions—Aetna in four regions and Humana in 24 regions—but these payers had limited regional engagement, taking an overall national approach to payer partnership. For example, instead of having regional representation for each participating region, the national payers would instead have one or two staff members representing their entire PCF partnership.

Exhibit 2.13. Payer partners were represented across nearly all PCF regions



Source: Mathematica’s analysis of PCF payer partner applications, interviews with payer partners, payer worksheet data, and communications with CMS.

Note: We display the total number of payers in each region. Two of the 23 total payers operate across multiple regions, resulting in more than 23 symbols (squares and triangles) shown on the map.

CMS = Centers for Medicare & Medicaid Services; PCF = Primary Care First.

2. The extent of payer partnership and the characteristics of payer partners

Payer participation continues to be limited in PCF compared with CPC Classic and CPC+, even with the influx of Cohort 2 payers.

The 23 payer partners that were participating at the start of 2022 offered a range of commercial Medicaid managed care, health insurance marketplace, and Medicare Advantage products, and more than half had prior primary care transformation experience. Of these 23 payers, 13 payers joined PCF in 2021 as part of Cohort 1, and an additional 10 payers joined PCF in 2022 as part of Cohort 2. In comparison, CPC+ had 52 aligned payers in 18 regions, and CPC Classic had 36 payers in seven regions. Of the payers that were partnering in PCF through the end of 2022, 85 percent were commercial payers that offered several different products within PCF, including fully- or self-insured products, marketplace plans, Medicare Advantage, and Medicaid managed care. The remaining 15 percent were state Medicaid programs.

More than half of the payers had previously partnered with CMS in CPC+, with Cohort 2 having a greater proportion of payers (80 percent) that had partnered with CMS in CPC+ compared with Cohort 1 (54 percent). Three payers withdrew from PCF in 2022, leaving a total of 20 payer partners participating in PCF at the end of 2022 (see Appendix B.4 for a list of all payer partners in 2022).

3. Payers' motivations for partnering in PCF

Most payer partners (82 percent) indicated that multi-payer collaboration was a significant motivator for joining PCF, yet only 25 percent of payers indicated that other payers' participation explicitly influenced their decision to partner in PCF. Half of payers interviewed reported that they see value in participating in PCF because they want to continue the momentum of primary care transformation from CPC+. In one example of payers being influenced by other payers, a payer that withdrew in 2022 said that the lack of multi-payer partnership in their region was a significant motivator for their withdrawal. This payer did not see return on investment in their participation in the model because of the lack of payer collaboration in the region and low practice participation.

4. Payers' perceptions of multi-payer collaboration in PCF

In 2022, payers reported that low rates of payer partner participation meant there were few opportunities for regional multi-payer collaboration, which was similar to the findings in 2021. Notably, the addition of the cohort 2 payer partners did not seem to change this perception. Because of the low rates of payer participation, almost half of the payers noted that they did not have any goals for multi-payer collaboration for PCF in 2022. Some payers indicated they had goals of improving data sharing, and several payers shared organization goals about health-related social needs. Some of these payer partners suggested that an effective regional convener, similar to what had been available through CPC+, encourages and facilitates multi-payer collaboration and would be value added to PCF.

5. Payers' approach to contracting with PCF practices

Most payer partners have limited contracts with PCF practices in place because of uneven participation of PCF practices in their regions. Similar to findings in the first annual report, payer penetration across regions was not correlated with practice penetration. Louisiana had four payer partners and 14 practices participating in 2022 (see Exhibit B.4.2 in Appendix B.4 for practice penetration by region). In contrast, Michigan had one payer partner and 321 practices participating in 2022. Among payers that have contracted with PCF practices in their region, 75 percent are leveraging existing value-based payment models, either payer specific or state based, rather than developing new contracts for PCF. Two payers that did develop PCF-aligned contracts indicated they exclusively offered these to PCF practices and no other practices. One payer noted that they offer their aligned contracts to PCF and non-PCF practices. A few payers said they do not contract with PCF practices because there are so few PCF practices in their geographic area.

3. Payments and supports practices receive and how practices experience them



Key takeaways

- In 2022, Cohort 1 practices' payments were substantially reduced relative to Performance Year 1 through the payment accuracy adjustment (PAA), which first took effect in July 2022. Among Cohort 1 practices, the median quarterly PAA was about 32 percent. In fact, while two-thirds of Cohort 1 practices earned a positive performance-based adjustment (PBA) in 2022, this adjustment did not offset the downward effect of the PAA on practices' payments, which was three times higher.
- Practices perceived the PAA as unfair because many visits with nurse practitioners who provide specialty care count as primary care visits and could contribute to the adjustment. Despite these concerns, most practices did not plan to make changes to mitigate the PAA's effect and, to some extent, believed visits contributing to the adjustment were inevitable.
- Despite the PAAs, Primary Care First (PCF) payments are 33 percent higher, on average, than payments would have been under fee-for-service (FFS) for certain primary care services.
- Most practices, about 60 percent, reported that PCF payments were less than adequate as of the end of their first year of participation (before the application of the PAA). In some cases, practices have reduced their care management staffing because of this perceived shortfall in funding.
- Most practices noted that PCF has had a minimal effect or has increased administrative burden, noting that practitioners are still coding services at the same level of effort as they did before PCF.
- Of the 18 payer partners included in our analysis, half were providing PCF-aligned payments supports to practices, which include both an alternative to FFS payment and a PBA.
- Practices had mixed views on the PCF data tools the Centers for Medicare & Medicaid Services (CMS) provided: some practices noted the tools were useful for tracking high-risk beneficiaries, but others cited limitations such as lag in availability of claims data and the complexity of using of the data.
- Practices found CMS learning support resources useful for facilitating peer-to-peer discussion, but some practices reported that these supports were less helpful than those provided through CPC+.

A. Focus of this chapter

This chapter describes the PCF Model incentives and supports that both CMS and its payer partners provided to PCF practices. We first describe CMS' payments to PCF practices in 2022 and practices' perceptions of these supports and estimate how PCF Model payments compared with payments that Cohort 2 practices might have received if they did not participate in the PCF Model. We describe how practices were impacted by the PBA and PAA, which took effect in 2022 for Cohort 1 practices. The chapter also reports on PCF practices' perceptions of the PCF payments, including perceived adequacy

3. Payments and supports practices receive and how practices experience them

and fairness of payments. We then describe the extent to which PCF payer partners have aligned their payments and other supports with the PCF Model. We conclude by describing how practices used learning supports, data supports, and waivers in 2022. In the text box below, we provide a summary of data sources used in this chapter.

Summary of data sources used in this chapter

Payments to practices

- Data from CMS on PCF payments to 2,845 practices for the PBPs and PBA in 2022
- Medicare FFS claims data to estimate FVF payments and compare PCF payments with FFS payments

Perceptions of payments and other supports

- 14 practice interviews conducted from November 2022 to February 2023
- 12 interviews with the parent organizations of PCF practices conducted from February to March 2023
- Round 2 PCF Portal Data from 2,941 practices as of the practices' first year of participation (2021 for Cohort 1 and 2022 for Cohort 2) (see Appendix A.1.4.)

Payer partners' approaches to PCF alignment and engagement

- 14 interviews with PCF payer partners conducted from October 2022 to February 2023
- 18 PCF Payer Partner Worksheets completed in fall 2022

Learning supports, data tools, and model waivers

- Round 2 PCF Portal Data from 2,941 practices as of the practices' first year of participation (2021 for Cohort 1 and 2022 for Cohort 2) (see Appendix A.1.4.)
- Claims and claim line feed usage data on 2,845 practices
- 49 practice interviews on perspectives of non-payment supports conducted from November 2022 to February 2023

B. PCF Model payments

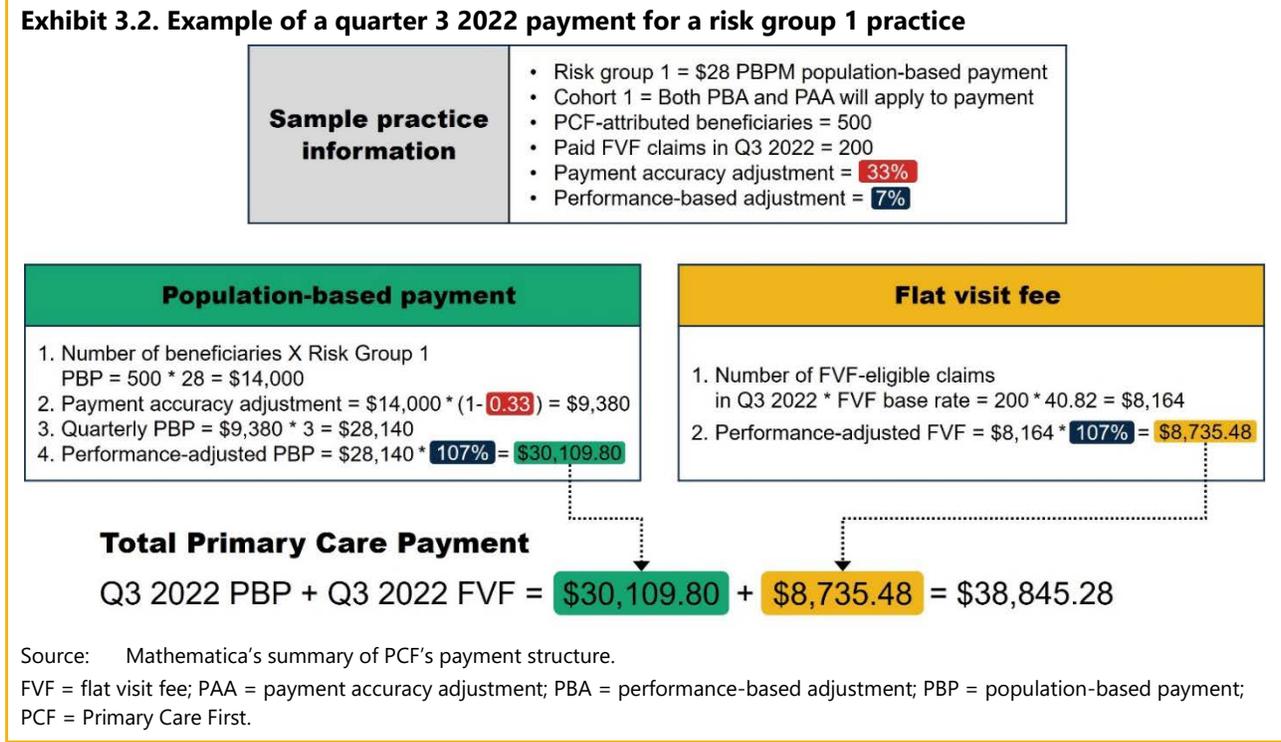
The main components of the payment model include a total primary care payment (TPCP) consisting of a population-based payment (PBP) and a flat visit fee (FVF) for certain primary care services (Exhibit 3.1), as well as a PBA tied to outcome measures. The PBP is a prospective monthly payment that practices receive quarterly for each beneficiary attributed to the practice. Beginning in July 2022 for Cohort 1 practices, the PBP was adjusted by the practice's quarterly PAA. The PAA took effect for Cohort 2 practices in July 2023. Practices receive a FVF for face-to-face primary care visits with attributed beneficiaries for E&M services and various services related to care planning and management (Appendix B.4). The PBA is an adjustment to the PBPs and FVFs based on performance on acute hospital utilization (for practices in risk groups 1 and 2) or total per-capita cost (for practices in risk groups 3 and 4) and Quality Gateway measures. The PBA took effect in April 2022 for Cohort 1 practices and April 2023 for Cohort 2 practices.

3. Payments and supports practices receive and how practices experience them

Exhibit 3.1. The PCF payment model replaces the Medicare fee schedule with a population-based approach

PCF payments to practices	
PBP	<ul style="list-style-type: none"> • A prospective monthly payment (paid quarterly) for each beneficiary attributed to the practice • Amount varies by risk group, from \$28 per beneficiary per month for risk group 1 to \$175 for risk group 4 • Adjusted by geographic location, performance, patients seeking primary care outside the practice, and retrospective debits for beneficiaries who become ineligible during the quarter
PAA	<ul style="list-style-type: none"> • A quarterly adjustment to the PBP to improve its accuracy starting in Q3 of the second performance year • Based on the number of certain primary care services (Appendix B.4) that attributed beneficiaries received outside the practice as a percentage of all qualifying services • Based on a rolling one-year period of service dates, which is lagged to allow for claims processing time
FVF	<ul style="list-style-type: none"> • A flat payment for certain face-to-face primary care visits with attributed beneficiaries (Appendix B.4) • The national FVF base rate of \$40.82 is adjusted by geographic location, the Merit-based Incentive Payment System, Medicare sequestration, beneficiary cost-sharing (based on the original FFS allowed amount), and the PBA
PBA	<ul style="list-style-type: none"> • A quarterly adjustment to the PBP and FVF to reward or penalize practices based on performance • Based on performance on acute hospital utilization (practices in risk groups 1 and 2) or total per-capita cost (practices in risk groups 3 and 4) relative to the national benchmark, peer region group benchmark, and their own historical performance • To be eligible for a positive PBA, practices must meet the minimum performance threshold on a set of Quality Gateway measures

As an illustrative payment example, Exhibit 3.2 describes quarter three (Q3) 2022 payments for a risk group 1 practice with 500 attributed beneficiaries, 200 FVF visits in the quarter, a PAA of 33% and a positive PBA of 7%. Risk group 1 practices are paid \$28 PBPM which equates to \$14,000 per month in this example. Once the PAA and PBA are applied and multiplied by 3, the quarterly PBP is \$30,110. For the FVF, the 200 FVF visits are reimbursed at \$40.82 per visit, or \$8,164 in total. Once adjusted for performance, the Q3 FVF is \$8,735. Adding the PBP and FVF together, the TPCP is \$38,845. This example does not include MIPS or geographic adjustments for simplicity.



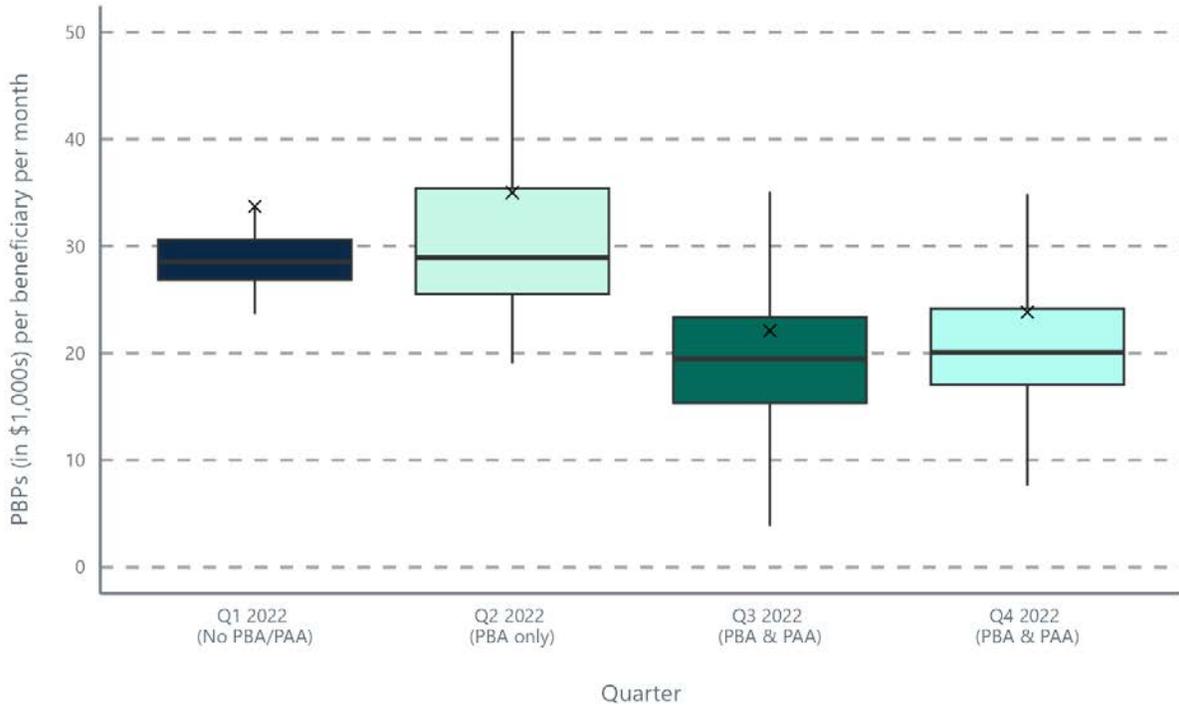
1. Population-based payments

Practices across both cohorts received an average of \$235,523 in PBPs in 2022. For Cohort 1 practices, CMS adjusted the PBP based on performance starting in April 2022, and the PAA took effect in July 2022. These adjustments took effect for Cohort 2 in 2023. On average, PBPs were 10 percent higher for Cohort 2 practices than for Cohort 1 in 2022 because of a higher average number of attributed beneficiaries and because CMS had not applied the PAA to Cohort 2 practice payments in 2022.

Although the PBA slightly increased PBPs on average, the PAA had a much larger effect in reducing payments for Cohort 1 practices. On a per beneficiary per month (PBPM) basis, there was little variation within risk groups in Q1 2022, but variation increased in subsequent quarters as the PBA and PAA took effect. In Q1, the only differences in practices' PBPM payments were because of geographic and MIPS adjustments, but subsequent quarters included much more substantial adjustments through the PBA and PAA. On average, across all risk groups, PBPs were lower in Q3 and Q4 after the PBA and PAA took effect compared with earlier quarters. For risk group 1 practices, the average PBP decreased from \$28.72 PBPM in Q2 2022 to \$18.11 PBPM when the PAA took effect in Q3 2022 (see Exhibit 3.3.).

3. Payments and supports practices receive and how practices experience them

Exhibit 3.3. PBPs decreased for Cohort 1 practices when the PAA was applied in Q3 2022 (risk group 1 only)



Source: Mathematica's analysis of 2022 PCF payments to Cohort 1 practices.

Notes: The boxes show the 25th percentile, median, and 75th percentile, and the X shows the average PBP for risk group 1. They are weighted by the number of attributed beneficiaries. We restricted this analysis to risk group 1 practices that were active as of the end of 2022 (N = 570). The PBA went into effect in Q2 2022. The payment accuracy adjustment went into effect in Q3 2022.

PAA = payment accuracy adjustment; PBA = performance-based adjustment; PBP = population-based payments; PCF = Primary Care First.

In interviews, many practices found that capitated payments, such as CMS' PBP, provided greater flexibility for providers, though a few practices found the payments unpredictable. Some practices also said that capitated payments provide more stability and reliability than FFS payments. These practices believe that the stability of payments allows for easier budgeting and hiring of staff. A few practices said, however, that the unpredictability of the PBA and PAA negate the benefit of the stability of the PBPs. In addition, a subset of practices within hospital systems reported that the administrative burden associated with payment reconciliation, such as those related to CMS payment errors and churn of attributed beneficiaries, adds a sense of instability to the payments.

"You're receiving money on a quarterly basis that helps cash flow of the clinic [for] things that clinics normally do, and that are not reimbursed. Care coordination is not reimbursed, and having those funds upfront is helpful."

— Cohort 1 practice,
population health manager

Many practices shared that the PCF attribution methodology accurately identified their patients, though nurse practitioners shared across multiple practices posed challenges for attribution.

Patients are attributed to PCF practices through annual wellness visits based on the provider conducting the visit or on voluntary alignment. A couple practices cited challenges with attribution, such as shared primary care nurse practitioners who provide annual wellness visits across multiple practices. Because nurse practitioners can only be assigned to one practice roster, the use of shared nurse practitioners means that patients might not be attributed to the practice where they receive most of their primary care, resulting in potentially inaccurate payments. This issue most acutely affects organizations in the model with multiple practices that share nurse practitioners.

Practices generally thought that their risk group assignment reflected their panel of patients based on diagnoses in their records, but some practices expressed concerns about the accuracy and timeliness of HCC scores to determine risk groups.

These challenges included the difficulty of HCC coding accuracy, the lag between changes in HCC coding and seeing changes in the risk score, and what practices saw as a long lookback period of two years for the risk score. Practices shared that the HCC codes likely do not reflect the true complexity of the patient's condition because providers might not consistently document all the patient's comorbidities. Practices are working on improving coding accuracy but noted that it takes time, potentially years, before improvements in coding translate to increased HCC risk scores. In addition, practices said that the lookback period of two years does not account for recent changes in patients' conditions, especially among older patients whose health could decline quickly in the last years of life.

Some practices suggested that an individual patient's HCC risk score should determine payment instead of using a risk group that is based on the practice's entire panel of Medicare patients.

These practices perceived that relative to risk groups, individual risk scores might be more responsive to changes in patients' status and better compensate the practice for the costs associated with providing care to more complex patients. The current methodology compensates a practice based on its risk group, which is the average HCC score of its entire PCF panel; respondents thought that a shift to individual risk scores could therefore represent a dramatic difference in the amount of PCF funding and have the most impact for practices that are on the cusp of two risk groups. Moving toward individual risk scoring, however, would elevate the importance of coding accuracy, an area in which practices have identified challenges, leaving them with the potential to receive lower overall payments.

2. Payment accuracy adjustment

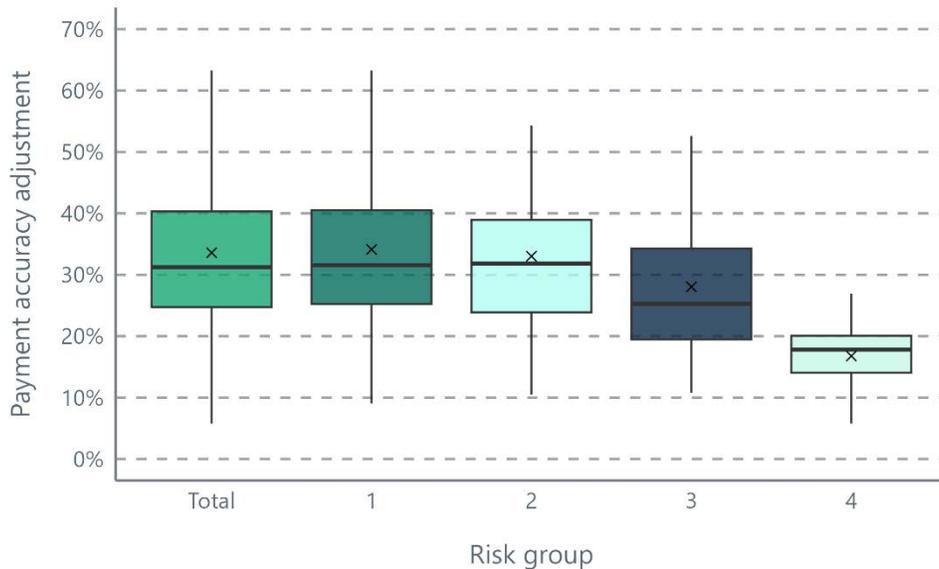
The PAA had a significant downward effect on Cohort 1 practices' payments in 2022. Among Cohort 1 practices, the median PAA across Q3 and Q4 2022 was about 32 percent, with most practices experiencing a reduction of 25 to 42 percent. Consistent with our findings in AR1, PAA rates in 2022 tended to be higher for risk group 1 practices than for other risk groups (see Exhibit 3.4). For example, although the median PAA for risk group 1 practices was about 32 percent, it was only 18 percent for risk group 4 practices. As described in the first annual report, some practices in risk groups 3 and 4 said that because their care model was designed for patients with complex needs, patients were less likely to seek care from multiple different primary care practitioners (Conwell et al, 2022).

PAA: Methodology and purpose

CMS calculates the quarterly PAA for each practice by dividing the number of certain primary care services (Appendix B.4) that attributed beneficiaries received outside the practice as a percentage of all qualifying services received at any practice over a rolling one-year period of service dates.

The PAA was designed to prevent CMS from paying twice for the same service, once through PBP to the PCF practice and once through FFS payment at another primary care practice.

Exhibit 3.4. PAAs were highest for risk group 1 practices



Source: Mathematica's analysis of 2022 PCF payment data to Cohort 1 practices.

Notes: The boxes show the 25th percentile, median, and 75th percentile of PAA rates for Cohort 1 practices and the "X" shows the average payment accuracy adjustment for each risk group. We restricted to practices that were active as of the end of 2022 (N = 678). The performance-based adjustment went into effect in Q2 2022. The payment accuracy adjustment went into effect in Q3 2022. Risk group counts: 570 in group 1; 80 in group 2; 19 in group 3; and 9 in group 4.

PBA = performance-based adjustment; PBP = population-based payments; PCF = Primary Care First.

Most practices described challenges with understanding and planning for the PAA as well as identifying strategies to reduce the amount of the adjustment. The most common challenges included an inability to control where patients seek care, limitations in the practices' ability to identify

3. Payments and supports practices receive and how practices experience them

sources contributing to the adjustment, and difficulty budgeting and planning because practices do not know what the adjustment will be until the beginning of the following quarter. Although some practices tried to communicate to patients the importance of seeking primary care at their PCF practice site, respondents said that they have little control over where patients seek care, and patients can decide to go somewhere more convenient for their needs rather than wait for the next available appointment.

Practices faced challenges in verifying the accuracy of the PAA in part because practices struggled to effectively use CMS' data tools.

Though CMS provides practices with access to summary-level quality, cost, and utilization data through its data feedback tool and Medicare claims data, respondents found it challenging to interpret the information or leverage the information in a useful manner to reduce the amount of the adjustment. These practices emphasized that using the available data would require an allocation of resources that are not readily available. Because practices could not verify the accuracy of the PAA, they also struggled to predict and budget for the adjustment.

"[The PAA] basically just offsets the value that we were seeing from the performance-based adjustments, since it's applied to the same set of funds... we have nurse practitioners that practice in a lot of our specialty clinics, that are under our same tax identification numbers. So, those, because of the way that it's set up, will count [toward the PAA]. Our shared nurse practitioners are serving multiple locations, can only be on that one roster, and so that's attributing to [the PAA]."

— Cohort 1, project manager

Practices perceived the PAA as unfair because visits with specialty care nurse practitioners may contribute to the PAA even when the patient seeks specialty care.

Because nurse practitioners working in specialty care may bill primary care service codes and be categorized with a specialty code that is eligible for the PAA, practices felt unfairly penalized. Practices shared that they have no control over the encounter with specialty care after they refer the patient. These practices noted that many nurse practitioners who work in specialty care often serve as the first point of contact for a referred patient.

"As a system, to help with access, we will direct patients to sister clinics if one clinic can't get someone in. And the goal of that is simply to keep people out of urgent care, emergency departments, and/or the hospital...We don't know how much that's going to hurt us. We've had a hard time understanding the rules of [the PAA]."

— Cohort 1 practice,
population health coordinator

Several practices noted frustration or confusion about adjustments resulting from patients accessing care within the parent organization but outside their attributed primary care practices, such as at an urgent care or walk-in clinic.

Many practices noted that parent organizations, such as health systems, offer urgent care and walk-in clinics to provide more opportunities for patients to be seen, supporting patient access to care at non-traditional times or when their primary care practice does not have available appointments. Parent organizations described these additional

sites as part of their overarching organizational strategy to improve access while preserving continuity, but they expressed concern that doing so did not align with the narrower PCF incentives around

3. Payments and supports practices receive and how practices experience them

continuity at the practice level. Specifically, when patients within a health system seek care at urgent care, the practice will see their PCF payments reduced through the PAA. Although the PAA is intended to be budget neutral, balancing reduced practice payments against new FFS payments to other entities, parent organizations nonetheless perceived the PAA as a penalty.

Despite concerns about the PAA, most practices did not plan to make changes to improve their PAA and, to some extent, believed visits contributing to the PAA to be inevitable. These practices said that they could not control where patients sought care, could not change their processes based on the expectations of a single payer, or did not have the resources to track the sources of the PAA and thus did not know how to intervene. Practices' perceptions of the PAA seem to stem in part from the adjustment not applying until the second year of practice participation in the model, making the adjustment appear as a penalty and resulting in a perceived reduction from the first year of PCF payments. Only a few practices said they would make changes to control the PAA by encouraging patients to seek care at the primary care practice site rather than in an acute setting or a walk-in site within the parent organization.

3. Flat visit fees

CMS designed the FVF structure to encourage continued face-to-face visits between clinicians and patients. After CMS calculates the deductible and coinsurance, the National Base Rate Adjustment sets the Medicare payment amount for FVF qualifying services provided to attributed beneficiaries to the national FVF rate of \$40.82 and applies a geographic adjustment to account for regional cost differences. In keeping with CMS' intent, most practices reported no change in the length or number of evaluation and management visits because of the structure of the FVF.

In 2022, Cohort 1 and 2 practices were paid an average of \$100 in FVF payments per beneficiary, though practices were split in their perception of the adequacy of the FVF payment. Annual FVF payments ranged from \$76 to \$726,427 (Exhibit 3.5). Average per-beneficiary FVF payments were lowest for practices in risk

group 1, and practices in risk groups 2, 3, and 4 had successively higher average FVF payments, likely reflecting the higher acuity of risk group 3 and 4's attributed patients. In fact, beneficiaries in risk group 3 and 4 practices had a median of 3.5 FVF billed codes in 2022 compared to less than 2 FVF billed codes for risk group 1 practices. Practices were divided in their perception of the adequacy of the FVF. Several practices said that the FVF in combination with the PBP sufficiently covered the cost of an E&M visit, but a few practices indicated otherwise.

Methods: Comparing PCF payments with FFS

To better understand how model payments differ from the Medicare payments that participating practices would have received under Medicare FFS, we conducted a payment comparison analysis using claims data from the baseline period.

We priced the use of 2019 primary care services using 2022 PCF Cohort 2 model payments and the 2022 Physician Fee Schedule. (See Appendix A.2.3. for a detailed description of the payment comparison methods.) Using pre-implementation data allowed us to compare payments without any influence on service use of PCF practices changing their care delivery. Therefore, actual model payments might differ from what this analysis shows if practices change the frequency and intensity of services delivered to attributed beneficiaries.

3. Payments and supports practices receive and how practices experience them

Exhibit 3.5. Per-beneficiary FVF payments were highest for higher risk group practices

	PCF risk group				Overall
	1	2	3	4	
Number of practices	2,524	252	46	20	2,842
Median number of FVF billed codes per beneficiary	1.7	2	3.5	3.6	1.8
Average total FVF payment per beneficiary	\$97	\$118	\$191	\$267	\$100
Average total FVF payment per practice	\$68,849	\$58,919	\$84,024	\$117,141	\$68,554
Smallest total practice FVF payment	\$133	\$76	\$308	\$3,190	\$76
Largest total practice FVF payment	\$726,427	\$423,872	\$333,161	\$663,557	\$726,427

Source: Mathematica’s analysis of 2022 claims data for all PCF practices.

Note: N = 2,842 practices that received any FVF payment in 2022. A single practice in risk group 2 did not receive any FVF payments. Some practices with low FVF payments involuntarily withdrew from PCF at the end of 2022 for not meeting the minimum beneficiary threshold. To calculate average beneficiaries attributed per practice, we weighted beneficiaries by the number of quarters in which they were attributed. For example, a beneficiary attributed to a practice for one quarter of the year would count as 0.25 beneficiaries.

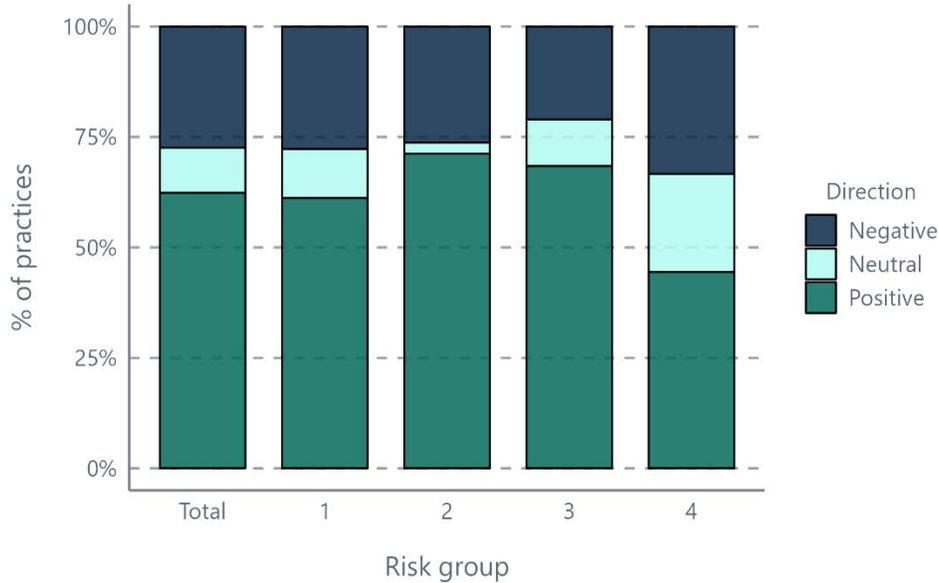
FVF = flat visit fee; PCF = Primary Care First.

4. Performance-based adjustments (including Quality Gateway performance)

The PBA, which began in April 2022 for PCF Cohort 1 practices, incentivizes practices to improve the quality of their care and to reduce acute hospital utilization (risk groups 1 and 2) or reduce total per-capita cost (risk groups 3 and 4). The PBA can increase payment by up to 50 percent or decrease it by as much as 10 percent based on practices’ performance. Unlike the PAA, which applies only to the PBP, CMS applies the PBA to both the PBP and the FVF payments. CMS applies the PBA after the PAA.

Among Cohort 1 practices, most practices (62 percent) received a positive PBA in 2022 (Exhibit 3.6). This adjustment did not offset the downward effect of the PAA on practices, which was much more significant. Specifically, although PBAs increased Cohort 1 practices’ quarterly payments by 7 percent on average, or \$14,477, the PAA decreased Cohort 1 practices’ payments by an average of \$42,998. The increase in payment due to the PBA was relatively modest, especially considering that practices could earn a maximum of a 50 percent positive adjustment. In addition, 27 percent of Cohort 1 practices received a negative PBA, and 10 percent received a neutral PBA in 2022. Risk group 2 and 3 practices were somewhat more likely to receive a positive PBA than risk group 1 and 4 practices. Most practices saw their PBA change quarterly in 2022. More than half of Cohort 1 practices (58 percent) received a combination of positive, negative, or neutral PBAs across quarters in 2022 (Exhibit 3.7). Conversely, 25 percent of practices earned a positive PBA in all three quarters, and 7 percent consistently received a negative PBA.

Exhibit 3.6. Most Cohort 1 practices received a positive PBA in 2022



Source: Mathematica’s analysis of 2022 PCF payment data to Cohort 1 practices.
 Notes: We restricted this analysis to Cohort 1 practices that were active as of the end of 2022 (N = 678).
 Risk group counts: 570 in group 1; 80 in group 2; 19 in group 3; and 9 in group 4.
 PBA = performance-based adjustment.

To be eligible for a positive PBA, risk group 1 and 2 practices must meet or exceed minimum thresholds for Quality Gateway measures:

- Diabetes: Hemoglobin A1c (HBA1c) Poor Control (electronic clinical quality measures [eCQM])
- Controlling High Blood Pressure (eCQM)
- Colorectal Cancer Screening (eCQM)
- Advanced Care Plan (Merit-based Incentive Payment System clinical quality measure [MIPS CQM]), which was a pay-for-reporting measure in 2021
- Patient Experience of Care Survey (PECS) (CAHPS® with supplemental items)

Exhibit 3.7. Variance in practice-level PBAs from April to October 2022

Direction of PBA	Number of practices
Changed categories across quarters	396 (58%)
Positive all three quarters	168 (25%)
Neutral all three quarters	69 (10%)
Negative all three quarters	45 (7%)
Total number of practices	678 (100%)

Source: Mathematica’s analysis of 2022 PCF payment data to Cohort 1 practices.
 Notes: We restricted this analysis to Cohort 1 practices that were active as of the end of 2022 (N = 678).
 Risk group counts: 570 in group 1; 80 in group 2; 19 in group 3; and 9 in group 4.
 PBA = performance-based adjustment.

Beginning in April 2022, Cohort 1 practices must have met the minimum performance threshold during the performance year 2021 (see Appendix B.5). For all measures except the Advance Care Plan measure, the benchmark was the 30th percentile compared with a benchmark population. The benchmark population for PECS Quality Gateway measure was all PCF practices, and the benchmark population for the other three measures was all MIPS reporters. By definition, approximately 30 percent of PCF

3. Payments and supports practices receive and how practices experience them

practices would fail the Quality Gateway based on the PECS measure threshold. For the Advance Care Plan measure, practices were only assessed on their ability to report the measure using a qualified registry in 2021. For practices in risk groups 3 and 4, there are two Quality Gateway measures for performance year 2021: the Advance Care Plan (MIPS CQM) and the PCF PECS. Practices that fail to report the quality measures are not eligible for a positive PBA. In Q2 to Q4 of the second performance year, practices that fail the Quality Gateway (based on prior year performance) will receive a neutral PBA (0 percent) or negative PBA (-10 percent), depending on their AHU or TPCC performance. Starting in the third performance year, practices that do not meet the Quality Gateway will automatically receive a negative PBA (-10 percent) in all PBA quarters for the performance year.

Nearly all practices met benchmarks for the eCQM Quality Gateway measures, but only 70 percent of practices met the PECS benchmark. In interviews, practices most commonly identified the PECS as a challenge to qualifying for a positive PBA. These practices criticized the PECS component of the Quality Gateway as unfair because they have little control over the low response rates that result in small sample sizes, and they see the Quality Gateway as having too high of a threshold. Partly in response to this feedback, CMS adjusted the PECS Quality Gateway measure starting in PY2024, moving from a benchmark population of all PCF practices to a static benchmark of 77.00. Several practices reported making changes to improve their performance on the Quality Gateway measures or improve care delivery across practices within the parent organization. For example, practices mentioned better monitoring relevant measures, incentivizing quality improvement through compensation, and providing pre-visit planning and reminders or care management after an acute event.

5. Comparison of PCF payments with the payments under the Medicare physician fee schedule for Cohort 2 practices

Contrary to CMS' expectation, simulated PCF payments for Cohort 2 practices were greater than FFS payments across all risk groups. CMS expected payments to the higher risk groups to exceed what practices received under the Medicare physician fee schedule because of the enhanced care patients would receive, CMS also expected that reimbursement under PCF would approximate that of FFS for risk group 1 (Centers for Medicare & Medicaid Services 2019). This is consistent with our analysis of Cohort 1 practices in the first evaluation report.

Without the PAA, total payments under the model were 63 percent greater, on average, than FFS payments for an equivalent set of services (Exhibit 3.8). Averaged across all risk groups, practices would have received \$40 in PCF payments (with a PBP of about \$30 PBPM without the PAA and a FVF payment of \$10 PBPM),¹³ compared with about \$24 PBPM in FFS payments for an equivalent set of services.

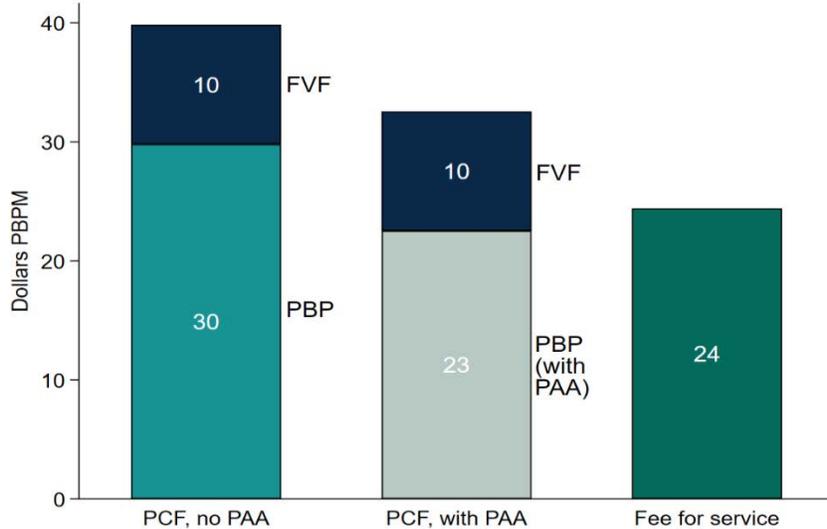
Including an estimate of the PAA, PCF practice revenues remained, on average, 33 percent greater than what they would have received under FFS. In this case, the PBP is reduced to \$23 PBPM. Under PCF, the largest payment component is the PBP, which accounts for 69 percent of payment-accuracy-adjusted Medicare payments. Taken together, the PBP and FVF are \$8 PBPM higher than what practices would have received under FFS. This finding implies that the model needs to generate

¹³ Although FVFs are not paid on a PBPM basis, we generated a PBPM dollar amount for comparison purposes.

3. Payments and supports practices receive and how practices experience them

reductions in overall expenditures of about \$8 PBPM to be cost neutral. We estimated the PAA based on actual primary care visits to non-PCF practice providers in 2019 (see Appendix A.2.3. for details).

Exhibit 3.8. PCF payments were higher than payments would have been under FFS



Source: Mathematica’s analysis using 2019 Medicare carrier claims data.

Notes: We calculated means across all risk groups and weighted them by the number of attributed beneficiaries. Payments are geographically and MIPS adjusted.

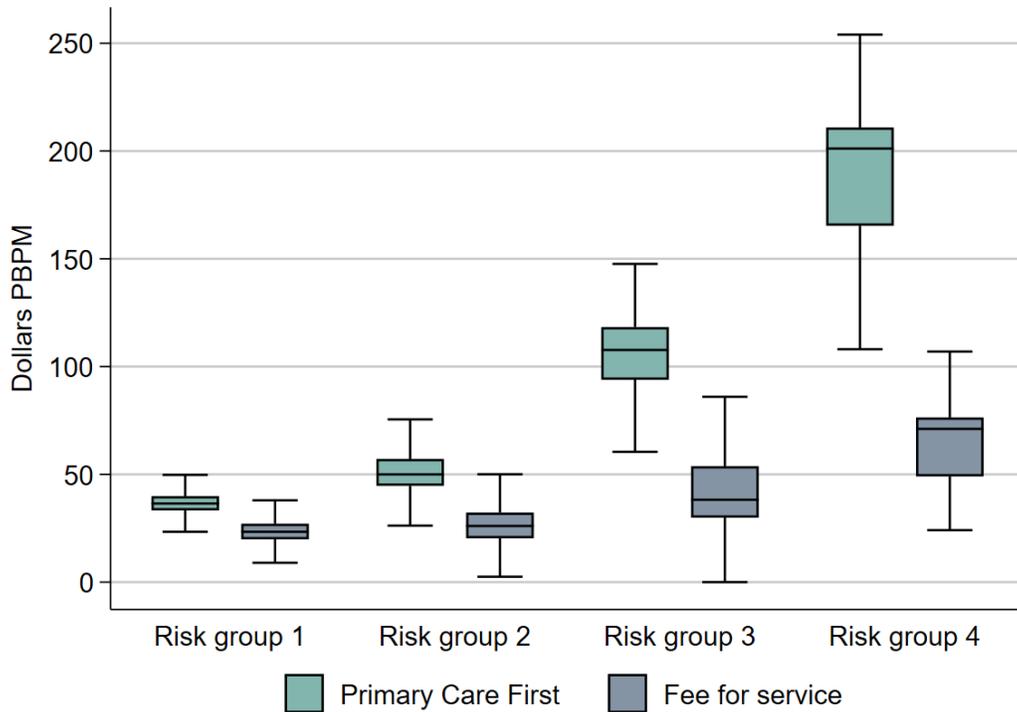
FVF = flat visit fee; MIPS = Merit-based Incentive Payment System; PAA = payment accuracy adjustment; PBP = population-based payment; PBPM = per beneficiary per month; PCF = Primary Care First.

These findings are consistent with the Cohort 1 payment comparison, which found that PCF Model payments were almost \$7 PBPM higher than traditional FFS. Because Cohort 1 practices received a positive PBA (which is not accounted for in this comparison) of about 7 percent in 2022 (Exhibit 3.6), this suggests that PCF payments might be even higher compared with FFS payments. In interviews, several practices reported that PCF payments were higher than revenue from the traditional fee schedule before the PAA was applied, and only a few practices thought PCF payments were equal to or lower than FFS.

The difference between model payments and what practices would have received under FFS increased based on risk group (Exhibit 3.9).

Payments under PCF including the PAA are, on average, 29 percent greater than FFS payments for practices in risk group 1 and 57 percent greater in risk group 2. For risk groups 3 and 4, model payments are more than twice as large as FFS payments would have been: 133 percent greater for risk group 3 and 164 percent greater in risk group 4. These differences are driven by larger PBPs for the higher risk groups because of the higher average acuity of the patients they serve.

Exhibit 3.9. The difference between PCF payments and FFS payments is larger in higher risk groups



Source: Mathematica’s analysis using 2019 Medicare claims data.

Notes: The boxes show the 25th percentile, median, and 75th percentile of differences between PCF payments and FFS payments for each risk group. Payments are geographically and MIPS adjusted.

MIPS = Merit-based Incentive Payment System; PBPM = per beneficiary per month; PCF = Primary Care First.

6. Practices’ perception of the adequacy of PCF payments

Most practices (about 60 percent) reported that PCF payments were less than adequate as of the end of their first year of participation.

Notably, they reported these data before they experienced the PAA, which significantly reduced PCF payments. In interviews, many practices noted that PCF payments alone were inadequate to cover the cost of care management and behavioral health staff. To hire or retain those critical staff, practices reported the need to pool PCF funds together with other funding sources or use non-revenue funds from a general operating budget. In some cases, practices reduced their care management staffing because of this perceived shortfall in funding, which was reported by both practices that did not participate in CPC+

Practices reported slight increase in administrative burden

CMS originally intended for PCF to reduce practices’ administrative burden associated with billing (Centers for Medicare & Medicaid Services n.d.). The model was intended so practitioners could spend more time with patients and deliver care based on patients’ needs. Most practices we interviewed, however, said that PCF has had a minimal effect or has increased administrative burden as practices encourage staff to focus on coding accuracy. These practices noted that practitioners are still coding services at the same level of effort as they did before PCF.

3. Payments and supports practices receive and how practices experience them

and those that did. However, practices that were not part of CPC+ often had some connection to the model through their larger parent organization, which had other practices participating in the model.

CPC+ participants were especially likely to perceive PCF payments as inadequate. In fact, according to data submitted to CMS, 70 percent of CPC+ participants rated payments as less than adequate compared with only 48 percent among non-CPC+ participants. Practices whose parent organization participated in CPC+ noted that PCF payments were significantly less than CPC+ payments. This is in part because CPC+ practices were paid dedicated care management fees in addition to payments for E&M services under the physician fee schedule. Most interviewed practices participated in CPC+ before PCF or did not participate in CPC+ but belong to a parent organization with practices that did participate in CPC+.

C. Practice and practitioner exposure to incentives of the PCF Model

Although CMS designed PCF as a practice-level intervention, many practices are associated with a larger parent organization, affecting how and to what extent practices are aware of, or feel and experience the impacts of the model's incentives. Larger parent organizations typically manage payments, such as those from PCF, at the parent organization level rather than through individual practices.

Practices tended to report that funds flowed from the parent organizations to the practice through two types of mechanisms:

- According to most interviewed practices and a few parent organizations, PCF funds are directly allocated and distributed to each PCF practice. Parent organizations said they shared the FVFs with their practices directly or by including the fees as part of their overall revenue calculation for individual providers.
- Less frequently, interviewed practices said that PCF funds flow into a budget used for population health spending that parent organizations manage at the organizational (not practice) level. This matches reports from a few parent organizations that said they reserved some PCF payments to centrally fund service delivery, including care management. In addition, when parent organizations centrally managed PCF resources, practices did not have as much flexibility in making practice-level care delivery changes. For example, one parent organization might require practices to get authorization from organizational leaders before investing in care management services.

Parent organizations vary in the extent to which they share PCF rewards or penalties with practices and individual practitioners. Several interviewed practices received (or will receive) adjustments to their PCF payment amount based on their performance on the quality measures. Of these, some practices said that the parent organization passed on the rewards and the penalties, and one practice said that it only received rewards. This finding aligns with what parent organizations reported in interviews. Some parent organizations, mostly horizontally integrated networks, shared some or all of PCF's financial risks and rewards with their practices and practitioners. A few parent organizations, mostly vertically integrated systems, did not share any of PCF's financial risks and rewards with their practices and practitioners. Several interviewed practices reported offering incentives to

practitioners that aligned with clinical quality measures included in the PCF Model and commonly shared among other value-based models. Several interviewed practices reported no changes to their compensation model since joining PCF.

D. Payer partner payments offered to PCF practices

CMS designed PCF as a multi-payer model to amplify the impact of its payments and other supports. Payer partners committed to aligning with the PCF Model's payment methodology, quality measurement strategy, and data sharing approach to align resources and incentives across a participating practice's entire patient population. When a complementary payment approach applies across a critical mass of practices' patient population, CMS hypothesizes that practices should experience fewer administrative burdens related to billing and

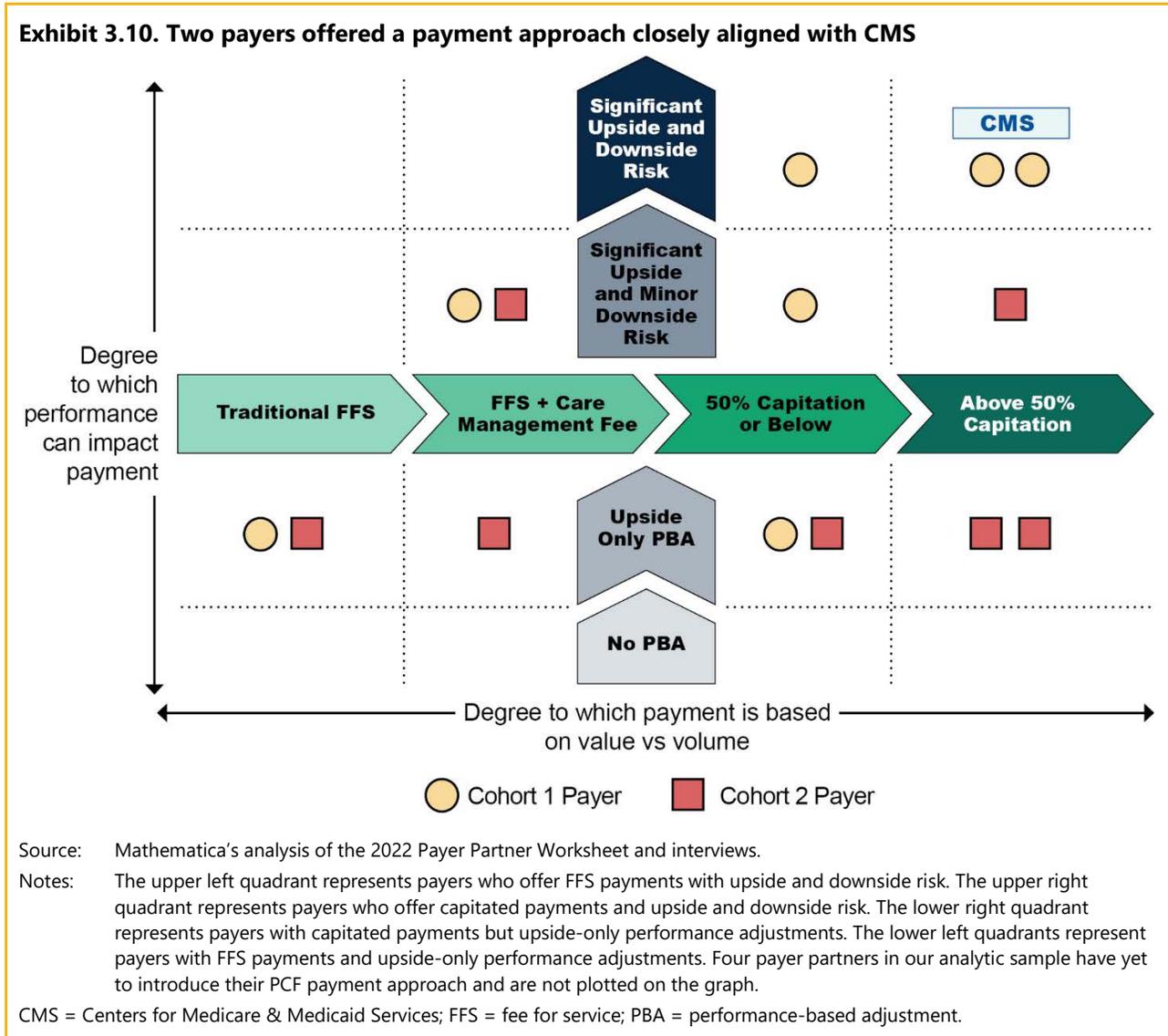
Practices perceived little alignment with PCF payer partners

When interviewers asked practices about their relationship with PCF payer partners, many said that although payer partnership existed, payment alignment with PCF was rare. Many practices reported having at least one contract with a PCF payer partner, but fewer practices reported having at least one payer partner that provided a PCF-aligned payment approach.

reporting requirements as well as a stronger incentive to invest in care delivery changes likely needed to be successful under the payment model. Furthermore, by aligning with CMS' approach, payer partners have the potential to reach patient populations beyond Medicare FFS beneficiaries and streamline processes and incentives for providers.

Overall, nine of the 18 payer partners included in this year's analysis provided alternatives to FFS payments and PBAs, with varying degrees of alignment with CMS' payment model (see Figure 3.10). Only two payer partners offer a payment model that aligns closely with CMS' payment approach, including both full primary care capitation with both upside and downside risk. Furthermore, three payer partners do not offer capitated payments or a PBA that includes downside risk, and an additional four payers had yet to introduce any payment approach for PCF in 2022. From 2021 to 2022, there were no major payment methodology changes among the Cohort 1 payers that offered an alternative to FFS payment and PBA.

3. Payments and supports practices receive and how practices experience them



The internal changes that payer partners required to implement PCF-aligned payments and the receptivity of practices to accepting changes in reimbursement posed challenges to payer partners (Exhibit 3.11). Like the findings included in the first annual report, payer partners continued to struggle with updating data systems to process alternative to FFS payments, which could be both time and resource intensive. In addition, payers reported practices’ aversion to taking on additional downside risk, and lack of practice readiness or willingness to accept capitated payments could be a barrier to implementing an aligned payment model. Finally, payers expressed that there weren’t always enough practices participating to warrant implementing a new payment model.

Exhibit 3.11. Lack of practice participation was the most common barrier to offering alternative to FFS payments



Source: Mathematica’s analysis of the 2022 Payer Partner Worksheet, “Did your organization experience any of the following barriers to offering alternative payments (other than FFS) to PCF practices.”

Note: N = 18 payers. Missing responses were treated as zeroes. Payers could select multiple challenges, therefore the total number of challenges reported exceeds the number of payers.

FFS = fee for service; PCF = Primary Care First.

Though only cited by a few payer partners, regulatory barriers are nevertheless an important external barrier to aligning payment approaches. Two Medicaid payers described challenges with state and federal rulemaking processes and getting state approval for their models. These payer partners anticipate the process will be time consuming and could potentially raise new barriers to implementation. Similarly, a commercial payer partner operating in several states reported that a Maryland state law prevented them from implementing any kind of capitated approach, though new legislation in 2022 might have reduced this barrier. A fourth payer partner cited a California state law that prevents practices from assuming downside risk.

Described below are more detailed findings about the individual components of payer partners’ payment approaches, including alternative to FFS payments, PBAs, and care management fees.

Practices commonly participated in non-PCF value-based payment programs

Practices commonly participated in commercial value-based payment programs, often shared savings arrangements or quality incentive programs, as well as the Medicare Shared Savings Program. Some of these practices said there were benefits to participating in these programs, such as aligned quality measures across multiple programs. Practices varied widely in their estimates of the proportion of patients covered by a capitated payment approach across all payers, including those not partnering in PCF. Several practices reported less than 30 percent, and some as few as 5 percent, of patients being covered through a capitated contract. Several other practices, however, reported that more than half of their patients were covered by a capitated contract.

3. Payments and supports practices receive and how practices experience them

1. Alternative to fee-for-service payments

About half of the participating payer partners offered partial or fully capitated payments. Among the payer partners that offered alternative to FFS payments, alignment with PCF varied. Only one payer partner launched its partially capitated payment approach in the first year of PCF. All other payer partners' alternative to FFS payment approaches pre-date the PCF Model, and these payers do not plan to change their models because of their participation in PCF. Four payers offer payment arrangements in which primary care payments are less than 50 percent capitated, and five payers have payments that are 50 percent or more capitated.

2. Performance-based adjustments

As with alternative to FFS payments, payer partners align PBA with CMS' payment model to varying degrees. Most payer partners (that is, 14 payers or 78 percent) adjusted payments to practices upward in 2022, rewarding them for quality, cost, and utilization performance. Nearly all these payer partners used their existing internal or state-based payment model to adjust practices' payment for performance. These payer partners rewarded practices for performance through a variety of payment approaches, including adjusting their alternative to FFS payments based on performance, retrospective bonus payments, shared savings models, and performance-adjusted care management fees.

Although most payer partners increased payments based on performance, seven payers, or 39 percent, adjusted practice payments downward if a practice had poor performance, a key component of CMS' payment approach for PCF. Payer partners exposed practices to a wide range of downside risk, ranging from 2 to 50 percent of practice revenue. Payer partners also assessed negative adjustments to practices' payments through a variety of mechanisms, including shared savings and quality disincentive measures. Two payer partners assessed downside risk by adjusting practices' capitated payment downward, which is CMS' approach.

Most payer partners calculated practice performance on at least some of the same measures that CMS uses in the PBA. As part of their partnership, CMS expected payers to use at least some, and preferably all, of the same quality and utilization measures as PCF to evaluate and reward or penalize practice performance. Most commonly, payers included Diabetes Hemoglobin A1c Poor Control, Colorectal Cancer Screening,

Payer partners continued to offer care management fees to practices to support practice transformation

Despite CMS deciding not to offer care management fees as a part of its PCF payment model, nearly half of payers were offering care management fees to practices in Performance Year 2 for their participation in PCF. Many payer partners offered care management fees before partnering in PCF because these payments were a central part of previous models' payment methodology, such as CPC+. In some cases, payer partners explained that they saw value in continuing the support as practices had grown used to receiving them and were using them to support practice transformation. Payer partners' main motivation for providing care management fees was to provide practices with the financial supports to change care delivery processes, improve documentation, or both (for example, recording Z-codes, which are ICD-10 codes that provide information beyond a diagnosis, such as indicating whether a patient has health-related social needs).

3. Payments and supports practices receive and how practices experience them

and Controlling High Blood Pressure in their quality measure sets. Only a few payers reported including patient experience as a quality measure. Among payers who reported using measures to make performance adjustments, the average number of measures reported was 7.5, though these measures sometimes differed by line of business. For example, different quality measures may be used for pediatric populations covered under Medicaid.

More than half of payer partners developed their PCF-specific quality measure set to align with CMS or modified their existing measure set to better align with PCF. These 11 payers noted the value to practices on aligning measures in reducing practices' administrative burden. Some payer partners' quality measures aligned with those used in PCF to varying degrees and have not taken any additional action to align with the PCF quality measures.

E. Practices' experiences with data feedback and learning supports from CMS and other payer partners

CMS and PCF payer partners offer a range of non-payment supports and incentives intended to help practices improve quality and lower costs. During 2022, practices reported widespread use of data and learning supports provided by CMS and, less frequently, reported use of waivers and incentives. PCF participants also received data and data supports from other payer partners and the Medicare Shared Savings Program.

1. Data tools

CMS provided PCF practices with claims and claim line feed (CCLF) data, the data feedback tool (DFT), and, in some regions, Encounter Notification Services (see text box).

Cohort 1, hospital-owned, and large practices were most likely to access CCLF data in 2022. More than half of PCF practices accessed CCLF data at least once in 2022, though only slightly more than one-third of practices did so monthly. Practices that accessed the CCLF were most often Cohort 1 practices, those with 10 or more practitioners, or those owned by a health system with a hospital (Exhibit 3.12). Consistent with our findings in AR1, among practices owned by a hospital-affiliated health system, 61 percent downloaded CCLF data compared with 43 percent of independent practices. These differences could point to the high level of resources and expertise required to access and use CCLF data.

In interviews, several practices noted the usefulness of CMS data supports to identify and track high-risk patients. This functionality informs and supports care management and continuity for patients and allows practices to track utilization and quality metric trends (for example, hospitalization and emergency department

CMS data tools

CCLF data: Part A, B, and D claims for Medicare FFS attributed beneficiaries, available for monthly download through the 4Innovation Data Hub.

DFT: A quarterly summary of region-level, practice-level, and beneficiary-level performance, including utilization, expenditure, and quality outcome data for attributed beneficiaries.

Encounter Notification Services: In select regions, near real-time alerts, mediated by Health Information Exchanges (HIE) that alert providers and care managers of a change in patient status such as hospitalizations to support timely care coordination and prevent avoidable readmissions.

3. Payments and supports practices receive and how practices experience them

utilization rates). In this way, the CMS data tools have the potential to support longitudinal and episodic care management activities.

Exhibit 3.12. Cohort 1 practices were much more likely to access CCLF data than Cohort 2 practices

Characteristic	Did not access CCLF data at all in 2022 (n = 1236)	Accessed CCLF data at least once in 2022 (n = 1609)	Accessed CCLF data every month in 2022 (n = 1003)
Total	43%	57%	35%
Cohort and CPC+ status			
Cohort 1	28%	72%	53%
Cohort 2, CPC+ participant	51%	49%	25%
Cohort 2, CPC+ non-participant	42%	58%	41%
Risk group			
Risk groups 1 and 2	44%	56%	35%
Risk groups 3 and 4	38%	62%	36%
Practice size^a			
Small (1 or 2 practitioners)	48%	52%	30%
Medium (3 to 9 practitioners)	45%	55%	33%
Large (10 or more practitioners)	32%	68%	49%
Practice affiliation^b			
Independent	57%	43%	17%
Owned by a health system with a hospital	39%	61%	42%
Owned by some other health care delivery organization	47%	53%	28%

Source: Mathematica’s analysis of data from the 4i datahub audit report for calendar year 2022, the practice roster (2022), and IQVIA (2021).

^a Excludes three practices that had zero attributed providers as of December 2022.

^b Excludes seven practices for which we are missing data on affiliation in the IQVIA database.

CCLF = claims and claim line feed; CPC+ = Comprehensive Primary Care Plus.

Practices that did access CMS data and data tools in 2022 struggled to fully use the tools because of delays in receiving data and difficulties using the tools. Nearly half of this

year’s practice sites noted a lag in the data CMS provided compared with other payer data supports. This is a common issue across CMS models because CMS requires at least 90 days of claims runout before the data can be reported. CMS took action to improve timeliness of data by

reducing the lag in updates to the data feedback tool by one quarter and by working with HIEs to provide near real time encounter data to care teams in select regions. In addition, several sites reported that they encountered challenges accessing, understanding, and using the data support resources. For

"I just wish [DFT] was a little bit more up to date. Because when we run those lists and we identify the patients, some of them are deceased when we reach out to them. So, I just wish it was a little bit more current."

— Cohort 1 practice, system lead

3. Payments and supports practices receive and how practices experience them

instance, a few practices relied on a team of analysts or a third-party vendor to use the CCLF data. In contrast to CMS' data tools, a few practices reported that data tools from other payer partners tend to be timely, comprehensive, and easy to access. In some cases, this is because payers make their data interoperable with the practice's EMR.

A few practices also reported that they struggled to calculate the PAA from the CCLF, describing it as “prohibitively burdensome,” despite the data guides. In

addition, a few practices reported that the DFT is difficult to navigate, requires a high degree of manual work to extract practice-level data for multiple sites, and is too complex for care providers to use regularly. Lastly, a few practices reported a lack of detailed data from CMS data support resources, and a few expressed frustration with linking CMS data files to patients (for example, lack of medical record numbers in the files).

"I can access and get into [CCLF]. I can't tell you what it's saying. Is there a training class for it, so I could access it? Because I was expecting to be able to have data that could support all of that. But they basically told me, no, you need an analyst, a mathematician almost, to decipher some of that information that's in there. It's all in code. It's not in everyday language."

— Cohort 1 practice,
quality improvement lead

2. Learning supports

Similar to the use of the data tools that CMS provided, many PCF practices reported in interviews having accessed or used CMS learning support resources at least once, and several practices reported regular access, use, and attendance of various CMS learning supports. These learning supports include the following:

- **PCF Connect:** This is a social networking site in which the CMS learning supports team and PCF practice respondents can create profiles, submit posts, and add comments.
- **Webinars:** CMS shares details about a specific portion of the model, such as the payment model.
- **Newsletters:** CMS sends out biweekly email newsletters to announce new guidance documents, upcoming deadlines, upcoming webinars, and any new model rules.
- **National Meeting:** This is an annual meeting for practices, payers, and other PCF stakeholders to come together to learn from each other and share ideas and strategies. The 2022 national meeting had 1,612 practices (55%) in attendance.
- **Help desk support:** This is individual practice support via email and over the phone, as needed.

Of the practices that accessed CMS learning supports in 2022, many found CMS learning support resources useful. For example, a few practices said they used PCF Connect to conduct practice-to-practice networking—noting the utility of learning from peer participants about how other practices are implementing the model—and to discuss payment attribution, patients' experience of care, and model participation.

Yet a few practices reported that these supports were less helpful, timely, and of lower quality than those provided through CPC+. For example, a few practices said that PCF webinars were not helpful and shared information that was too generic and framed for practices that had not participated

in prior transformation initiatives, such as CPC+ and CPC Classic. As part of their feedback, several practices expressed a desire for practice coaches, such as those provided during CPC+, and supports focused on best practices that participants can implement and use to manage their model participation, instead of generic model overviews.

3. Waivers and beneficiary engagement incentives

CMS offers waivers and beneficiary engagement incentives to PCF practices; one of the most significant ones allows practices to reduce or waive the applicable co-insurance for the FVF, with practices responsible for covering those costs. This cost-sharing waiver allows practices the flexibility to remove financial barriers and focus on populations that might benefit most from co-insurance support, such as those with frequent or recent emergency department and hospital visits.

Other examples of beneficiary enhancements include free or discounted local transportation services for beneficiaries requiring face-to-face care with their PCF practice or follow-up services outside the primary care setting (such as transportation to a pharmacy or to a health care provider for specialty care), access to nutrition assistance programs, and remote patient monitoring technology. An additional waiver allows nurse practitioners to certify the need for diabetic shoes.

Practices did not commonly use these waivers and beneficiary enhancements. According to the data practices submitted to CMS, 21 percent of all practices reported using at least one of the waivers after their first year of participation. More specifically, among the available waivers and incentives, practices most commonly provided medical equipment to beneficiaries (19 percent) followed by transportation (18 percent), and nutrition incentives (13 percent). In all, 6 percent of practices are providing cost-sharing support; they most commonly provide this support to beneficiaries experiencing financial hardship. Only about 5 percent of practices reported allowing nurse practitioners to certify the need for diabetic shoes.

4. How did participating practices approach PCF during their first year of participation?



Key takeaways

- PCF practices reported making many care delivery changes in their first year of PCF participation, suggesting they are actively working to improve care across many different areas rather than focusing on just one or two.
 - Most PCF practices made improvements to care delivery activities related to care management and comprehensiveness and coordination, particularly for activities relating to their patients' health-related social needs. Practices overwhelmingly reported that care management was their main strategy for reducing acute hospitalizations and/or total cost of care.
 - Practices also did more advance care planning, improved patient education about alternatives to emergency department care, enhanced health information technology capabilities, and increased use of data.
 - Care delivery changes frequently differed by risk group. Risk group 3 and 4 practices were more likely than risk group 1 and 2 practices to make changes for most care delivery activities.
 - Among practices affiliated with larger health care organizations, parent organizations reported playing a central role in making decisions about which care delivery interventions to implement and how practices should implement them, though many considered practice feedback during the decision-making process. Parent organizations also said they were more likely to enhance existing care delivery interventions or processes than start new ones.
 - PCF practices have found it challenging to reduce acute hospitalizations or total costs of care. Risk group 1 and 2 practices found it more challenging than risk group 3 and 4 practices.
 - Most practices felt they had improved their patients' quality of care, were at the forefront of primary care transformation, and were aligned with other value-based payment initiatives during their first year in PCF. In contrast, fewer practices felt they had increased their practice revenue. Fewer former CPC+ participants felt they had increased their revenue compared to the practices that did not participate in CPC+.
-

A. Focus of this chapter

In the first annual report, we described what Cohort 1 practices planned to do in their first year of Primary Care First (PCF) participation (Conwell et al. 2022). In this chapter, we focus at a high level on the changes all PCF practices in both cohorts reported making to their care delivery processes during their first year of participation in PCF—that is, 2021 for Cohort 1 and 2022 for Cohort 2.¹⁴ Using the PCF care delivery requirements and the causal pathways for the PCF evaluation as a guide, we describe how practices approached PCF:

- What changes they made to their care delivery
- Whether those changes differed by key practice characteristics
- What their main strategies have been for reducing acute hospitalizations and costs
- How challenging it has been for practices to reduce hospitalizations and costs
- To what extent practices have achieved other goals related to PCF participation

To complement this chapter's comprehensive assessment of implementation at a high level, in Chapter 5, we present a more in-depth exploration of key strategies among a subset of PCF practices with whom we conducted interviews, including a description of the factors that affected implementation of these strategies. Chapter 5 also dives into the implications of the care delivery changes made by these practices on the PCF causal pathways and provides early evidence of changes in outcomes.

¹⁴ To facilitate comparisons between Cohorts 1 and 2, we intentionally reported data at the end of the first performance year for both cohorts. Additionally, we were not able to report data from the second performance year for Cohort 1 because these practices were inadvertently asked the incorrect set of general model questions, and as a result, these data are not usable.

4. How did participating practices approach PCF during their first year of participation?

Data sources used in this chapter

Data from the PCF Practice Portal as of the end of practices' first year of participation (2021 for Cohort 1, 2022 for Cohort 2). For more detail on portal data collection methods, refer to Appendix A.1.4.

- CMS' implementation contractor collected Cohort 1 data from December 2021 to January 2022 and collected Cohort 2 data from October to November 2022.
- Our analysis included data from all practices that were (a) active as of the date of portal data collection for their respective cohorts and (b) answered at least one portal question.
- Closed-ended items included in analysis: N = 785 practices for Cohort 1 (97 percent response rate) and N = 2,156 for Cohort 2 (99 percent response rate).
- Our analysis included data from closed-ended questions that addressed (a) changes made to care delivery in the first year of PCF, (b) how challenging practices report it has been to reduce hospitalizations and costs, and (c) what other goals practices reported achieving related to PCF participation, as well as data from an open-ended question asking practices about the main strategies they used to reduce acute hospitalizations or total cost of care during the first year of PCF. The full set of questions is available in Appendix B.6. Frequencies for responses to all closed-ended items are in Appendix B.7, Exhibit B.7.1.

Data from 12 interviews regarding the role of parent organizations with system-level respondents conducted between November 2022 and March 2023.

Note: It is important to keep in mind that these are **self-reported data** and are not objective measures of practice activities. For example, it is possible a practice reported in the portal that it did not increase its revenue when an objective comparison of revenue data would reveal it did increase practice revenue, or vice versa. Further, due to the natural variation in how individuals can interpret survey questions, when we say practices reported they "made changes" to an activity, the true meaning of the phrase "made changes" could vary in several ways. Practices could make changes to activities that are new for the practice, or they could make changes to existing activities that were in place before PCF participation. Practices could also make changes specifically or solely due to their participation in PCF, or the changes could relate more directly to other value-based programs or broader quality improvement initiatives. In addition, practices could make a great deal of change or a smaller amount of change.¹⁵

B. Putting PCF practice activities in context: Care delivery requirements and causal pathways

Although the PCF Model is less prescriptive than some prior Centers for Medicare & Medicaid Services (CMS) models, such as Comprehensive Primary Care (CPC) Classic and CPC+, PCF practices still must implement a set of care delivery interventions described in the participation agreement (Exhibit 4.1). For example, practices must provide 24/7 access to a care team practitioner with real-time access to an electronic health record (EHR).

¹⁵ We have modified the wording for the next round of portal items so we can better distinguish between larger and smaller care delivery change efforts.

4. How did participating practices approach PCF during their first year of participation?

These requirements are the same for both cohorts but vary by risk group. Practices in risk groups 3 and 4 serve a more medically complex population and receive a higher per-beneficiary-per-month (PBPM) payment and had four additional requirements beyond what is asked of practices in risk groups 1 and 2 in their first year of PCF. For example, risk group 3 and 4 practices must develop and maintain personalized care plans for all of their high-risk PCF beneficiaries. That said, the care delivery requirements represent *minimum standards of care* that PCF practices are expected to deliver, and CMS presumes that participating practices will explore various ways to change care delivery rather than limit themselves to the activities encompassed in the care delivery requirements.

Exhibit 4.1. Participating practices are required to implement several PCF care delivery interventions

PCF care delivery requirement	Required for risk groups 1 and 2	Required for risk groups 3 and 4
Access and continuity		
Provide 24/7 access to a care team practitioner with real-time access to EHR	◆	◆
Ensure timely callbacks for high-risk PCF beneficiaries with complex care needs		◆
Care management		
Provide risk-stratified care management for all empaneled patients	◆	◆
Ensure all PCF beneficiaries receive timely follow-up contact from the PCF practice after ED visits and hospitalizations	◆	◆
Collaborate with all high-risk PCF beneficiaries to develop and maintain documented personalized care plans addressing their goals, preferences, and values		◆
Comprehensiveness and coordination		
Integrate behavioral health into primary care services	◆	◆
Assess and support patients' psychosocial needs	◆	◆
Ensure specialty care coordination for your high-risk PCF beneficiary population through formal relationships or agreements with specialty groups and other care organizations		◆
Create and maintain an inventory of services and supports in the community to meet PCF beneficiaries' health-related social needs ^a		◆
Patient and caregiver engagement		
Implement a regular process for PCF beneficiaries and caregivers to advise PCF practice improvement	◆	◆
Planned care and population health		
Set goals and continuously improve upon key outcome measures	◆	◆

Sources: PCF Model, PCF Component, Amended and Restated PCF Practice Participation Agreement, First Amended and Restated Participation Agreement for Cohort 1, August 31, 2021; PCF 2023 Bilateral Participation Agreement Amendment: Summary of Changes for Cohort 1 and 2, October 2023.

^a This became a requirement for risk group 1 and 2 practices in 2023. However, it was not a requirement during PCF practices' first year of participation, which is the focus of this chapter.

PA = participation agreement; ED = emergency department; EHR = electronic health record; PCF = Primary Care First.

4. How did participating practices approach PCF during their first year of participation?

As described in Chapter 1, the PCF evaluation uses causal pathways as a framework to describe practice care delivery activities, identify potential mechanisms of change, and illustrate how these practice strategies might affect key outcomes. The causal pathways focus on the main ways PCF practices aim to reduce acute hospitalizations and expenditures: through episodic and longitudinal care management strategies and comprehensiveness and coordination strategies of specialty care coordination, behavioral health integration, and addressing health-related social needs. Other primary care functions and activities such as planned care and population health provide support for practices to better implement changes along the causal pathways (Exhibit 4.2). To align with this framework, in this chapter we summarize how practices reported approaching PCF in their first year of participation as they map to the causal pathways and other key primary care activities.

Exhibit 4.2. Causal pathways and other primary care functions and activities illustrate how PCF practice activities might affect key outcomes

Causal pathways	
Care management	Comprehensiveness and coordination
<ul style="list-style-type: none">• Episodic care management• Longitudinal care management	<ul style="list-style-type: none">• Specialty care coordination• Behavioral health integration• Improve care to address health-related social needs
Other primary care functions and activities	
<ul style="list-style-type: none">• Access and continuity• Planned care and population health• Health information technology (HIT)	<ul style="list-style-type: none">• Patient and caregiver engagement and education• Staffing

Note: The causal pathways for PCF are described in detail in Chapter 1.

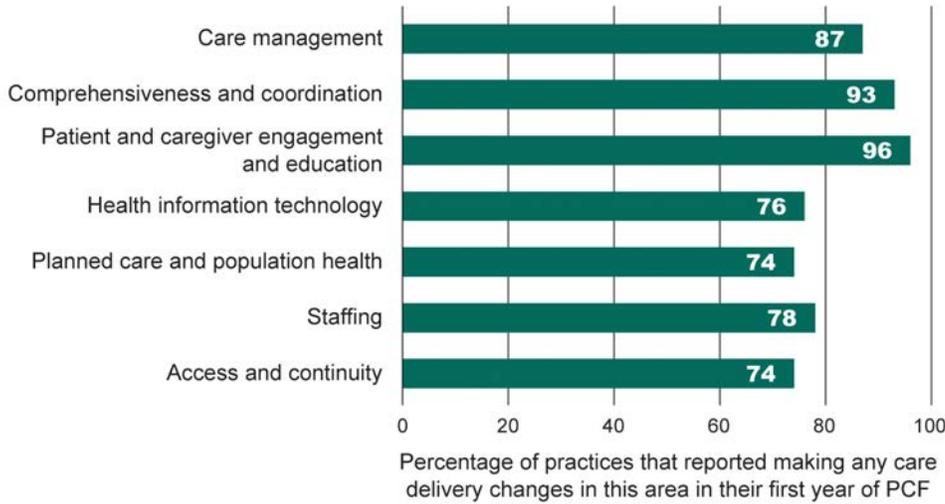
C. Care delivery changes practices reported making in their first year of PCF

PCF practices reported making many care delivery changes, suggesting they are actively working to improve care delivery across multiple areas rather than focusing on just one or two areas.

More than 70 percent of practices reported making changes to one or more care delivery activities for each of the seven areas we asked about across the causal pathways and other primary care functions (Exhibit 4.3). Further, about 90 percent of practices reported making changes in four or more areas (see Appendix B.7, Exhibit B.7.3). For reporting purposes, we grouped the data for practices that reported being *in the process of implementing* a certain change with data for practices that reported they *have completed* a certain change into a single category that we refer to as having *made changes*.

4. How did participating practices approach PCF during their first year of participation?

Exhibit 4.3. More than 70 percent of PCF practices reported making changes to care delivery activities across seven areas of primary care



Source: Mathematica’s analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2); 2,941 practices.

Most PCF practices made changes to their care management capabilities, and care management was their main strategy to reduce acute hospitalizations and expenditures. Overall, 87 percent of PCF practices made changes in care management in their first year of participation in PCF. At a more detailed level, more than two-thirds of practices reported they improved or expanded longitudinal care management¹⁶ processes to help patients manage medical conditions between visits or improved or developed new episodic care management¹⁷ processes to systematically follow up with patients after a hospital discharge or an emergency department (ED) visit (Exhibit 4.4). The focus on these processes is consistent with the episodic and longitudinal care management causal pathways and aligns with the care management care delivery requirements for PCF practices.

Exhibit 4.4. Most PCF practices made changes to care delivery activities in care management

Care management	Reported care delivery changes	% reported change
Longitudinal care management	Improved or expanded care management processes to help patients manage medical conditions between visits	71
	Developed or updated care plans for seriously ill and other complex, chronically ill patients	65
Episodic care management	Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit	70
	Improved or expanded ability to be notified when patients have a hospital discharge or ED visit	59

Source: Mathematica’s analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Notes: Total n=2,941 practices. Green shaded cells indicate more than two-thirds of practices overall reported making these changes.

CM = care management; ED = emergency department; PCF = Primary Care First.

¹⁶ Longitudinal care management provides long-term assistance to patients with chronic or ongoing health issues.

¹⁷ Episodic care management provides shorter-term assistance to patients with a new diagnosis or injury; an acute exacerbation of an existing condition; or, most commonly, a transition from a hospital or other facility.

4. How did participating practices approach PCF during their first year of participation?

Further, when asked specifically how they worked to reduce acute hospitalizations or total cost of care in their first year of PCF, care management was the most frequently mentioned strategy (76%), with a greater focus on episodic care management than longitudinal care management (see Appendix B.8, Exhibit B.8.1).¹⁸ This indicates care management was not only an area where most practices reported making changes, but it is also a high-priority care delivery activity for PCF practices.

Over 90% of PCF practices made changes to care delivery activities related to comprehensiveness and coordination, particularly for activities relating to addressing their patients’ health-related social needs. More than two-thirds of practices reported increasing screening for patients’ social needs and improved coordination with community resources to meet patients’ social needs. Fewer practices—but still about half—reported making changes to specialty care coordination and behavioral health integration (Exhibit 4.5). These changes reflect the comprehensiveness and coordination causal pathways as well as the PCF care delivery requirements to integrate behavioral health services and assess and support patients’ psychosocial needs.

On the other end of the spectrum, fewer than one-third of practices reported making changes to the following three comprehensiveness and coordination care delivery activities: (1) reduced use of lower-value tests or other services, (2) expanded the types of medical services provided at the practice site to reduce referrals to specialty care, and (3) improved handoffs to a new primary care provider (PCP) when patients leave the practice. These were also the least frequently reported care delivery changes relative to other activities, suggesting they are not high priority change areas for the majority of PCF practices.

Exhibit 4.5. More than two-thirds of PCF practices made care delivery changes to address patients’ health-related social needs

Comprehensiveness and coordination	Reported care delivery changes	% reported change
Improve care to address health-related social needs	Increased screening for patients’ social needs	69
	Improved coordination with community resources to meet patients’ social needs	68
Specialty care coordination	Improved coordination with other providers (for example, home health agencies and pharmacists)	59
	Improved coordination with specialists	54
Behavioral health integration	Added behavioral health staff or in some other way enhanced behavioral health integration at our practice site	45
Other activities related to comprehensiveness and coordination	Increased access to palliative care	40
	Reduced use of lower-value tests or other services	33
	Expanded the types of medical services provided at the practice site to reduce referrals to specialty care	28
	Improved handoffs to new PCP when patients leave the practice	27

Source: Mathematica’s analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Notes: Total n = 2,941 practices. Green shaded cells indicate more than two-thirds of practices overall reported making these changes. PCP = primary care provider; PCF = Primary Care First.

¹⁸ This finding is based on data from an open-ended portal question: “What have been your practice site’s main strategies for reducing hospitalizations or costs during your first year of participation in PCF?” We coded a randomly selected sample of responses to this question. For additional detail, see Appendix A.1.4.

4. How did participating practices approach PCF during their first year of participation?

Advance care planning, patient education about alternatives to the ED, health information technology (IT), and use of data to improve care were also primary care activities many practices made changes to in their first year of PCF participation (Exhibit 4.6). In addition, when asked how they worked to reduce acute hospitalizations and total expenditures, practices frequently said that patient and caregiver engagement and education and increased access to care were strategies they used to achieve those goals (Appendix B.8, Exhibit B.8.1).

Exhibit 4.6. Many PCF practices made care delivery changes related to other primary care functions and activities, such as patient and caregiver engagement and education

Other primary care functions and activities	Reported care delivery changes	% reported change
Patient and caregiver engagement and education	Improved advance care planning	87
	Educated patients and caregivers about alternatives to the ED	76
	Initiated or increased contact with high-risk patients who have not had a recent contact with the practice	62
	Implemented or improved a process for patients and caregivers to advise practice improvement (for example, PFACs)	60
Health IT	Enhanced health information technology capabilities	76
Planned care and population health	Increased use of available data to improve care delivery	74
Staffing	Reorganized roles or responsibilities of existing staff	64
	Added more medical assistants, nurses, or care managers	52
	Added more practitioners	38
Access and continuity	Increased patient access to practitioners via non-billable care	56
	Increased patient access to practitioners via billable care	45
	Scheduled longer appointments for more complex patients	45

Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Notes: Total n = 2,941 practices. Green shaded cells indicate more than two-thirds of practices overall reported making these changes.

ED = emergency department; IT = information technology; PCF = Primary Care First; PFAC = patient and family advisory council.

D. PCF practice profiles: Key differences in reported care delivery changes between different types of practices

After describing what care delivery changes practices reported making in their first year of PCF participation, we then assessed whether those changes differed by seven key practice characteristics: risk group, participation in CPC+, practice affiliation, practice size, cohort, Medicare Shared Savings Program ACO participation, and Social Vulnerability Index (SVI) quartile. We focused on differences of at least 10 percentage points or more between practice subtypes.

Care delivery changes frequently differed by risk group. Risk group 3 and 4 practices were more likely than risk group 1 and 2 practices to make changes to most care delivery activities (Appendix B.7, Exhibit B.7.4). This clear trend likely reflects a few major differences between risk group 1 and 2

4. How did participating practices approach PCF during their first year of participation?

compared to 3 and 4. First, the PCF payment model pays risk group 3 and 4 practices¹⁹ more than risk group 1 and 2 practices. Second, risk group 3 and 4 practices may be taking a more holistic approach to serve their patients that are more medically complex than the patient mix for practices in risk group 1 and 2. And, third, there are additional care delivery requirements for practices in risk group 3 or 4. The largest difference between risk groups was for palliative care: 71 percent of risk group 3 and 4 practices reported they increased access to palliative care compared to 40 percent of practices in risk groups 1 and 2. Increased access to palliative care was defined as having increased referrals to palliative care, trained practice staff in palliative care, or added palliative care practitioners to their practice. In addition, a larger proportion of risk group 3 and 4 practices compared to risk group 1 and 2 practices added practitioners (64 versus 38 percent) and improved their ability to be notified when a patient has a hospital discharge or ED visit (85 versus 59 percent). These differences highlight the importance of staffing and care management for risk group 3 and 4 practices.

Care delivery changes occasionally differed when comparing CPC+ participation status, practice size, practice affiliation type, and cohort. There were no meaningful differences by Medicare Shared Savings Program ACO participation, and no differences at all by SVI quartile.

- **CPC+ participation:** Former CPC+ participants were less likely to make some care delivery changes related to high-risk patient care, data, and technology compared to practices that did not participate in CPC+. Fewer former CPC+ participants reported they initiated or increased contact with high-risk patients who had not had a recent contact with the practice (55 versus 70 percent, the largest difference between these two groups). Former CPC+ participants were also less likely than practices that did not participate in CPC+ to improve or expand their ability to be notified when patients have a hospital discharge or ED visit, increase use of available data to improve care delivery, or enhance their health information technology capabilities (see Appendix B.7, Exhibit B.7.5). Site visits with selected PCF practices suggest the reason former CPC+ participants might report making fewer improvements to care delivery in PCF could be due to former CPC+ participants having already made many care delivery improvements during CPC+ to fulfill the CPC+ care delivery requirements. Because many CPC+ goals and requirements complement and align with those of PCF, much of the practice transformation work that former CPC+ practices did in CPC+ is still useful and relevant to PCF. Thus, former CPC+ participants would have less need to make those changes now or improve upon those processes in PCF.
- **Practice size:** Larger practices were more likely to increase their staff count and add new types of medical services compared to smaller practices. Large practices with more than 10 providers were more likely to report they added practitioners compared to smaller practices (62 percent of large practices versus 37 percent of medium and 28 percent of small practices, the largest differences between these types of practices). Large practices also expanded the types of medical services provided at the practice site, increased access to palliative care, and added more medical assistants, nurses, or care managers when compared to small- and medium-sized practices (see Appendix B.7, Exhibit B.7.6).
- **Practice affiliation:** Practices affiliated with hospital-based systems were less likely than other practices to make changes related to their patients getting care outside of their practice. Compared

¹⁹ Note, the PCF payment model also provides risk group 3 and 4 practices with substantially higher payments than these practices would have received if they were being paid based on the standard Medicare FFS payment model.

4. How did participating practices approach PCF during their first year of participation?

to independent practices and practices in another type of health care delivery organization, fewer practices affiliated with hospital-based systems improved or expanded their ability to be notified when patients have a hospital discharge or ED visit (54 percent of practices affiliated with hospital-based systems versus 71 percent for other practices, the largest difference between these types of practices). Practices affiliated with hospital-based systems were also less likely to improve coordination with specialists or increase education for patients and caregivers about alternatives to the ED (see Appendix B.7, Exhibit B.7.7). These results may reflect that practices affiliated with hospital-based systems may already have these care delivery capabilities. If so, they would have less need to make further changes to these activities compared to other practices. For additional context on what PCF implementation has been like for practices affiliated with a parent organization, see the callout box below.

Parent organizations played an important role in making care delivery change decisions for PCF practices affiliated with a larger health care organization

Although PCF was intended to be implemented as a practice-level intervention, for PCF practices affiliated with a parent organization—a larger health care organization of some kind—decisions about care delivery changes did not necessarily happen at the individual practice site.

All the parent organizations we interviewed reported making decisions about care delivery changes centrally rather than at the individual practice level. However, several parent organizations considered practice feedback during the decision-making process or allowed for flexibility around how practices implemented the changes.

Parent organizations reported they selected care delivery changes to implement based on varying combinations of the following three factors:

1. The data from a centralized quality-metric dashboard, for example, indicated patient need and room for improvement.
2. The change supported the goals of PCF and other value-based purchasing models.
3. The change would financially benefit the parent organization.

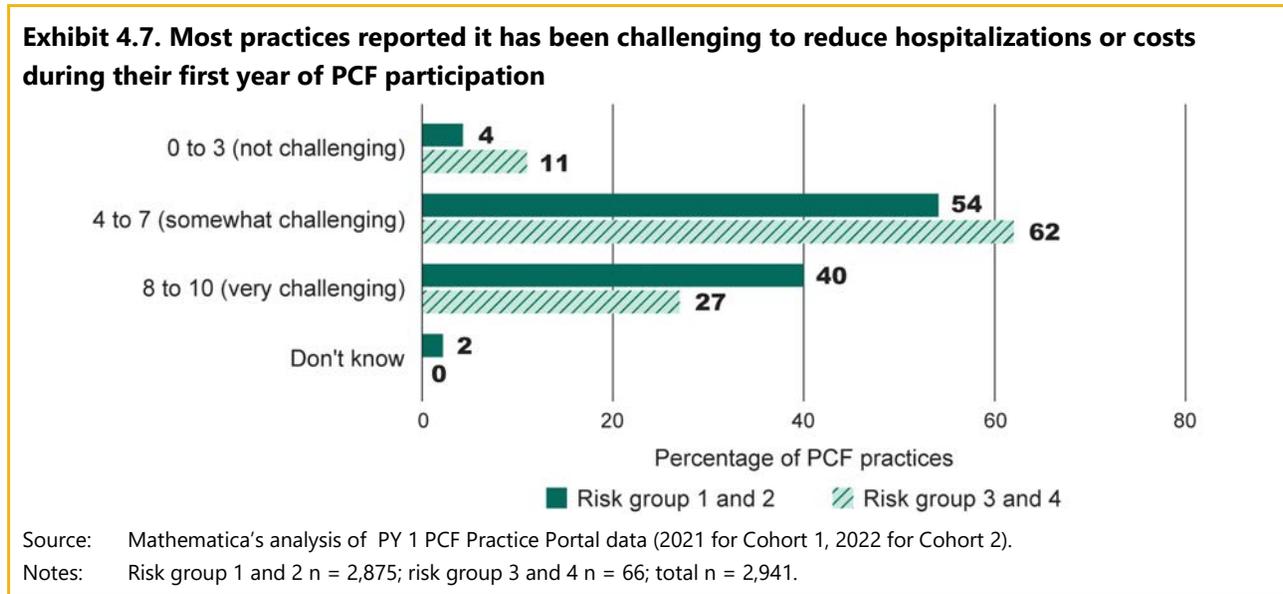
Most parent organizations reported they made enhancements to existing interventions—for example, by hiring additional care managers to support episodic care management; administrators did not describe any fully new care delivery interventions under PCF.

- **Cohort:** Compared to Cohort 1 practices, a larger proportion of Cohort 2 practices increased patient access to practitioners via billable care (50 versus 33 percent, the largest difference between cohorts). Cohort 2 practices were also more likely to report they reorganized roles or responsibilities of existing staff and added more practitioners (see Appendix B.7, Exhibit B.7.8).
- **Medicare Shared Savings Program ACO participation:** We did not see any meaningful pattern of differences of reported care delivery changes between practices that participate in a Medicare Shared Savings Program ACO compared to ones that do not (see Appendix B.7, Exhibit B.7.9).
- **SVI quartile:** There were no differences in reported care delivery changes between practices in SVI quartiles 1 and 2 (that is, practices that served a less vulnerable population) versus quartiles 3 and 4 (practices that served a more vulnerable population) (see Appendix B.7, Exhibit B.7.10).

E. Practices’ challenges and achievements in their first year of PCF participation

Slightly more than half of PCF practices said it was somewhat challenging to reduce acute hospitalizations or total costs of care in their first year of PCF participation, and about 40 percent reported it was very challenging (Exhibit 4.7).²⁰ A smaller proportion of risk group 3 and 4 practices compared to risk group 1 and 2 practices reported it has been very challenging to achieve the model outcomes during their first year of PCF participation (27 versus 40 percent).

In addition, there is some consistency in how challenging practices predicted it would be to reduce acute hospitalizations or total cost of care at baseline and how challenging they said this ended up being during their first year of PCF participation. Specifically, practices that had reported being *very confident* in their ability to reduce acute hospitalizations or total costs of care before the launch of the model tended to say that reducing hospitalizations or costs was *only somewhat challenging* in their first year, while practices that were *not at all or not very confident* in their ability to reduce hospitalizations or costs at the start of PCF said that reducing hospitalizations or costs was *very challenging* in their first year (see Appendix B.7, Exhibit B.7.11).

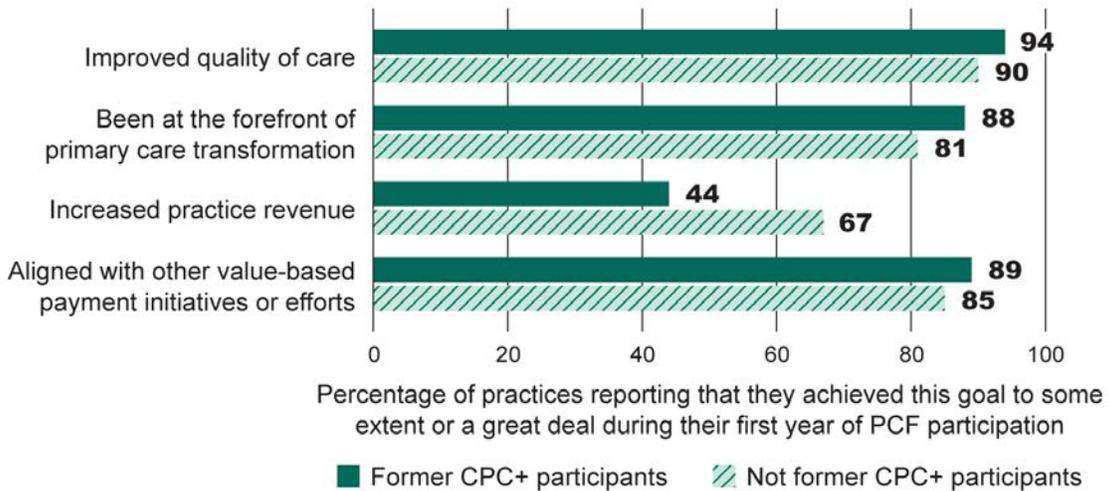


²⁰ These data are from a portal question that asked practices to use a scale of 0 to 10 to describe how challenging it has been for their practice site to reduce acute hospitalizations or total cost of care during their first year of participation in PCF. We created categories from the 0 to 10 scale: not challenging (0 to 3), somewhat challenging (4 to 7), and very challenging (8 to 10).

4. How did participating practices approach PCF during their first year of participation?

Although the primary aim of the PCF model is to reduce AHU/TCOC, practices also had other goals they hoped to achieve during their PCF participation. **Most practices reported feeling they had improved their quality of care, were at the forefront of primary care transformation, and were aligned with other value-based payment initiatives during their first year in PCF.²¹ In contrast, fewer practices reported feeling they had increased their practice revenue** (Exhibit 4.8). In addition, fewer former CPC+ participants reported feeling they had increased their practice revenue compared to the practices that did not participate in CPC+ (44 versus 67 percent, respectively). This aligns with the finding noted in Chapter 3 that practices whose parent organization participated in CPC+ reported PCF payments were significantly less than CPC+. It is important to note that these data were collected before practices experienced the PCF Payment Accuracy Adjustment, which had a significant downward effect on PCF payments for Cohort 1 and is expected to have a similar effect for Cohort 2, which we will report on in AR3.

Exhibit 4.8. Most practices reported feeling they had achieved additional goals during their first year of PCF participation.



Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Notes: Former CPC+ participants n = 1,508; non-former CPC+ participants n = 1,433.

²¹ These data are from a portal question that asked practices to indicate if they felt their practice site had achieved each of these four goals so far during their participation in PCF. The data reported here reflect the combined number of practices that said "Yes, a great deal" or "Yes, to some extent" for each goal.

5. Care delivery changes implemented under PCF and evidence that practices are making progress along their causal pathways



Key takeaways

- Most of the practices we interviewed reported building on improvements in care management and comprehensiveness and coordination of care in 2022, efforts that they had already started under previous value-based payment programs, including Comprehensive Primary Care and Comprehensive Primary Care Plus.
- Practices benefited from being part of a larger health care system that could offer them additional resources, having experience measuring performance under value-based contracts, and having robust and compatible electronic health record systems to capture and share data. They faced challenges hiring and retaining enough staff to implement their care delivery changes as planned.
- Practices in risk groups 1 and 2 relied mainly on the two primary care functions of care management (including longitudinal and episodic care management) and comprehensiveness and coordination (including integrating behavioral health, addressing health-related social needs, and coordinating care with medical specialists) to reduce acute hospitalizations. They also reported implementing activities in the other three primary functions (access and continuity, patient and caregiver engagement, and planned care and population health) to support improvements in outcomes.
- Practices in risk groups 3 and 4 reported continuing to build on their more individualized, holistic, and comprehensive approach to care for patients with complex needs, modifying existing activities spanning all five of the primary care functions.
- Practices anticipated that the modifications they were making to their primary strategies, in combination with other supportive activities, would be sufficient to further reduce acute hospital utilization (for risk groups 1 and 2) and total per-capita cost of care (for risk groups 3 and 4).
- There is limited evidence that changes in practices' care delivery by the end of 2022—with the possible exception of longitudinal care management—have improved outcomes relative to outcomes at similar practices not participating in Primary Care First.

A. Introduction

The primary purpose of the round two practice data collection was to:

1. Understand the extent to which practices made changes under PCF in 2022 (the second year of participation for Cohort 1 practices and the first year for Cohort 2) by expanding existing activities or implementing new ones
2. Describe the activities they implemented and the extent to which these changes were expected to move them along the hypothesized causal pathways to their intended outcomes

3. Identify internal and external factors that influenced the successful implementation of changes in the delivery of primary care under PCF
4. Review the early qualitative and quantitative evidence on whether practices' changes moved them along the causal pathways toward improved outcomes

In Chapter 4, we discussed the changes that the entire set of PCF practices reported making to their care delivery processes during their first year of participation in PCF. In Chapter 5, we present a more in-depth exploration of key activities among a subset of PCF practices with whom we conducted interviews.

Based on findings from our round one interviews—and corroborated by data participating practices submitted to CMS through the PCF portal—we focused the round two practice interviews on two of the most frequently cited primary care functions for reducing acute hospitalizations among practices in risk groups 1 and 2: **Care management** and **comprehensiveness and coordination**. As discussed in Chapter 4, most PCF practices reported making changes to their care management capabilities and care management as their main strategy to reduce acute hospitalizations and expenditures. A similarly high proportion of practices reported implementing changes to comprehensiveness and coordination of care. Because of the variation in care management strategies (and the differences in how they

are expected to affect outcomes), we sampled practices focused on longitudinal care management (for patients with chronic or complex medical conditions) versus those using episodic care management (for patients experiencing a care transition such as after a hospital discharge) separately. The second commonly reported primary care function (comprehensiveness and coordination) spans multiple strategies, including integrating behavioral health, addressing health-related social needs, and coordinating referral management with medical specialists. However, because of the overlap in activities across these strategies and the similarities in how they are likely to affect outcomes, we sampled

Data sources used in this chapter

- Data from interviews with 49 practices, first divided into four samples based on their risk group assignment. Risk group 1 and 2 practices were further divided by the following primary strategies for reducing acute hospitalizations:
 - Longitudinal care management (risk groups 1 and 2)
 - Episodic care management (risk groups 1 and 2)
 - Comprehensiveness and coordination (risk groups 1 and 2)
 - Serving patients with complex needs (risk groups 3 and 4)
- PCF application and roster data from 2022
- PCF Practice Portal data as of the end of practices' first year of participation (2021 for Cohort 1, 2022 for Cohort 2). (We do not use PCF Practice Portal data from the second performance year [2022] for Cohort 1 because the survey inadvertently used an incorrect set of general model questions, making the responses unusable for this analysis.)
- Medicare FFS claims and enrollment data for estimating impact of model on claims-based leading indicators

practices using comprehensiveness and coordination strategies to reduce acute hospital utilization as a group.²²

In addition to interviewing practices in risk groups 1 and 2, we interviewed a sample of practices in risk groups 3 and 4 that serve higher-acuity patients with more complex conditions. Because of their holistic and integrated approach to care, we did not stratify this sample by primary care function. We describe our data collection design and methodology in Appendix A.1.5.

In the remainder of this chapter, we start by summarizing the five main factors that practices said influenced their ability to effectively implement the care delivery changes under PCF (Section B). We then describe the changes that practices in risk groups 1 and 2 reported making in 2022, first for the two commonly cited primary care functions for reducing acute hospitalizations (care management and comprehensiveness and coordination), followed by a higher-level summary of changes made related to the three less frequently reported primary care functions (access and continuity, patient and caregiver engagement, and planned care and population health) (Section C). Next, because of their holistic approach to care, we describe the overall change strategies practices in risk groups 3 and 4 reported making to lower total per-capita cost of care (Section D). We conclude with a review of the evidence that practices have moved along their hypothesized causal pathways toward reducing acute hospital utilization and lowering total per-capita cost of care (Section E).

Potential bias in sampling approach

The responses obtained through interviews with the four practice groups might not reflect the experiences of practices we excluded from the analysis or were unable to categorize based on their portal data (because they provided insufficient detail or appeared to focus on a different primary care function). A comparison of portal data between practices we mapped into one or more of the groups versus those we could not suggests the risk of bias in our sampling approach is low (see Appendix A.1.5).

B. Contextual factors influencing implementation of changes under PCF

The context in which practices operate affected their care delivery transformation. In our interviews, practices described how characteristics of their practice setting affected the types of care delivery changes they pursued after joining PCF and the degree to which they were able to accomplish their plans. These characteristics fall into six main areas: (1) prior experience with value-based payment arrangements, (2) affiliation with a larger health care system, (3) staffing capacity, (4) ties to community resources, (5) patient engagement, and (6) robust and compatible electronic health record (EHR) systems. We describe these factors here to provide context for understanding the facilitators and challenges that practices experienced in implementing the care delivery changes we discuss in the next section.

²² Although we sampled practices in risk groups 1 and 2 on these three commonly reported strategies to reduce acute hospitalizations (longitudinal care management, episodic care management, and comprehensiveness and coordination), we also asked them about changes they implemented in 2022 related to the other three primary care functions CMS highlighted in its PCF Care Delivery Interventions Guide: (1) access and continuity, (2) patient and caregiver engagement, and (3) planned care and population health.

Previous or ongoing participation in other public and private value-based payment arrangements laid the foundation for practices' additional care delivery improvements under PCF.

The goals and requirements of these other payment arrangements—including Primary Care Medical Homes, Medicare and Medicaid ACOs, and especially CPC+—largely complemented and

aligned with those of PCF, especially for practices in risk groups 1 and 2. These payment arrangements provided funding, created incentives and other resources that enabled practices to provide new services, leveraged data infrastructure, and improved care delivery processes that they carried into and enhanced for PCF. Even practices that did not directly participate in CPC+ or other population- and performance-based payment arrangements benefited from them if they were part of a larger health care system that had other practices participating because systems typically made care delivery changes across their practices to standardize care delivery. Several practices in risk groups 3 and 4 faced challenges, however, navigating the differences between other payment arrangements and PCF, particularly those related to required measures and risk scoring.

"If we were starting from scratch in [PCF], we wouldn't have as many resources to be able to do what we did [under PCF]."

— System lead

What systems thought about their role in implementing changes under PCF

- Most systems reported providing member practices with additional staff, most commonly care managers and administrative population health staff but also social and community health workers, behavioral health providers, pharmacists, and diabetes educators.
 - Systems typically pooled and centrally managed these resources, especially clinical and administrative staff who specialized in specific functions (for example, monitoring hospital discharge notifications).
 - Systems said that centralizing staff resources increased efficiencies in implementing activities across practices, maximized the number of patients staff can serve, and standardized improvements across all practices, including those not participating in PCF.
- Systems also supported practices with quality metric tracking and data analysis. Several systems provided health IT support to their member practices, and a few handled practices' requirements to report quality measure data to CMS.

Belonging to a larger hospital-based health care system or a network of group practices also helped practices implement care delivery changes under PCF.

Systems were often the ones to decide whether to join PCF rather than the individual practices within them. They also commonly took the lead in developing processes and centralizing or deploying resources for practices, which helped practices standardize workflows and enhance their capacity to make changes and address challenges, although it often took time to integrate these new workflows. Practices valued how their systems gave them access to robust EHR systems, which provided helpful data and other functions to support their care delivery processes. Practices also gained access to staff and practitioners from their systems to support their care delivery changes, especially care managers but also pharmacists, behavioral health specialists, social workers, dieticians, and medical specialists. Systems reported similar types of supports

in interviews on the role of parent organizations in PCF care delivery changes (see the text box called What systems thought about their role in implementing changes under PCF).

The ability to retain and expand staff capacity was challenging but vital for practices to carry out their care delivery changes to the degree they planned.

Practices reported using PCF funds to retain the care management and behavioral health staff they hired during their participation in CPC+ or in other value-based payment models they participated in before joining PCF. Practices

that did not participate in CPC+ reported making new investments to expand their care management and care coordination teams. Yet many practices struggled to hire enough qualified staff to meet their hiring needs, especially care managers, behavioral health staff, and social workers. Many of these challenges stemmed from workforce supply shortages in the community that were exacerbated by COVID-19 and, for some practices, an inability to compete with higher salaries that larger health care organizations offered.

Establishing connections with community resources helped practices overcome challenges linking patients with needed services outside of the practice.

Developing relationships with other providers and community organizations helped practices refer their patients to specialty care, behavioral health, and social services, which practices reported as often being in short supply and difficult for patients to access on their own. Community organizations and practices faced similar challenges in finding sufficient numbers of behavioral health staff, social workers, and other staff to meet the demand from primary care referrals for their services.

Practices faced challenges engaging patients in care delivery changes, especially care management.

In some cases, patients were reluctant to enroll in care management because their insurance did not cover certain services, such as home care, and patients could not afford to pay out of pocket for them. Practices serving lower-income communities also struggled to bridge cultural and language differences with their patients and to address barriers that hindered patients' ability to engage in care delivery changes, such as a lack of reliable transportation and cell phone service. Engaging patients was less of an issue for more established practices with practitioners who worked in the community for many years, understood patients' circumstances, and earned their trust.

"We're swimming upstream because we try to implement all of these things and then, if you don't have people on the frontlines, it undermines what you're trying to do."

— Practitioner

"It's really frustrating for our community health workers whose sole purpose in life is to connect patients with resources, and if they get a referral and they can't find a resource in the community that fits that patient's need, it's just really demotivating and really difficult."

— System lead

EHR systems with multiple functionalities that could communicate with other providers' EHRs helped practices identify patients who could benefit from care delivery changes, access needed information about them, and coordinate their care with other providers. Interoperability with hospital EHRs enabled practices to bridge gaps and avoid unnecessary delays in information about the care their patients received elsewhere. Connections to these systems also helped practices become aware of patients sooner after they were discharged—commonly through admission, discharge, and transfer notifications—so that care managers could promptly reach out to them. Risk stratification algorithms embedded in EHRs helped identify patients at high risk for hospitalization and other adverse outcomes. Robust EHRs also helped practices identify gaps in care and assist with screening for and addressing patients' health-related social needs, such as by providing prompts and templates for practitioners and staff to respond to and by tracking referrals to community resources and specialists.

"So having a template in front of you, it prompts those conversations [about health-related social needs] that I feel like many didn't even go there before, where now providers are going to those conversations that they may have dismissed in the past as not the most important thing."

— Practitioner

Physician engagement in PCF leadership and implementation

Physician engagement with health system transformation is associated with improved health outcomes and lower costs (Perreira et al. 2018, 2019). Understanding practitioners' awareness of and engagement with practice transformation activities in the PCF Model will help inform strategies for designing and implementing similar alternative payment models in the future.

Evidence from the PCF portal shows that, during the first year of the model, physicians provided leadership or participated in implementation activities at about three-quarters of all participating practices. Stated another way, one-quarter of all practices reported not having a physician involved in either leading or implementing care delivery changes. Among practices with a physician champion, only three-quarters reported their physician leads (1) were knowledgeable about PCF advanced primary care functions, (2) incorporated these functions into regular use, and (3) provided implementation leadership to others. Physician leadership and involvement in PCF implementation were highest among practices in risk groups 3 and 4, in those that were independent or unaffiliated with a health care system, and in those that had previously participated in CPC+.

Using interview data, we classified practices' level of physician engagement based on their physicians' (1) awareness of the model, (2) participation in care delivery activities, and (3) understanding of how their performance affected PCF payments. Using a threshold of meeting at least two of the three criteria, we classified 21 (43 percent) of the 49 practices we interviewed as having engaged physicians. (We classified 18 as having disengaged physicians; we could not classify the remaining 10 because of unclear or conflicting responses.) Practices characterized as having engaged physicians reported their physicians were actively involved in care transformation activities, regularly reviewed quality measures, attended monthly meetings or huddles in which they discussed quality

performance issues or the needs of high-risk patients, and identified opportunities for practice improvement and process changes.

Practices characterized as having engaged physicians were also more likely to say that PCF increased the amount of time their physicians spent treating patients by hiring dedicated staff to manage other clinical and nonclinical aspects of care and increasing the length of time physicians could spend with patients who have complex needs. Other practices, however, which were more likely to be characterized as having physicians that were not engaged, said that PCF shortened the amount of time their physicians were able to spend with patients because of increased administrative burdens associated with documenting quality measures or administering new tools to identify health risks and social needs.

These findings (presented in full in Appendix B.12) are consistent with findings from the CPC+ evaluation and suggest that successful implementation of care improvements under PCF and similar performance-based capitated payment models in the future might benefit from developing guidance and supports designed to foster physician leadership and engagement in practice transformation activities.

C. Changes in care delivery under PCF among practices in risk groups 1 and 2

Here, we describe care delivery changes made under PCF in 2022 as they relate to care management and comprehensiveness and coordination for practices in risk groups 1 and 2. For each group, we review the qualitative information to assess the extent to which participating practices implemented care delivery activities that, in theory, should move them along their hypothesized causal pathway toward lower acute hospital utilization. Our goal was to identify the specific operational changes practices made to improve care delivery and outcomes. We support our interview findings with information from the PCF portal on care delivery changes reported by all practices (not just those we interviewed) during their first year of participation in the model.

1. Care management

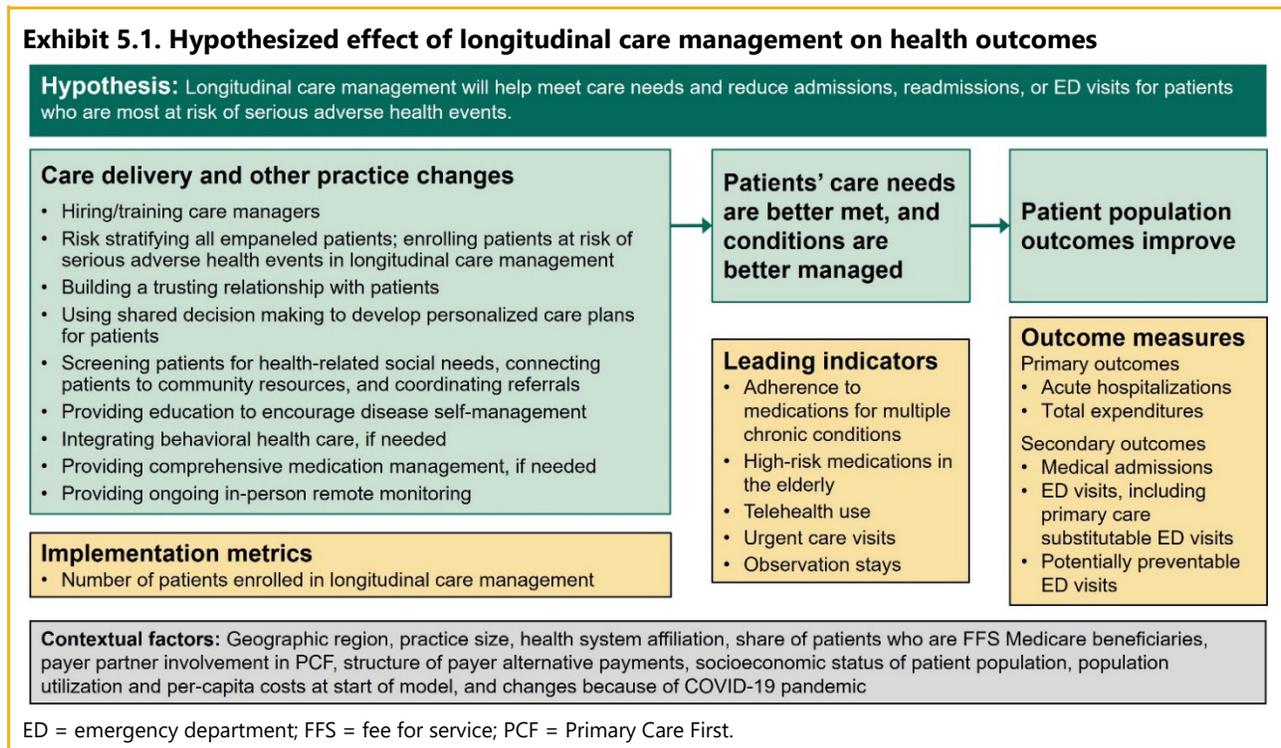
Practices provide care management to support patients between office visits and other transitions of care to help them maintain or improve their health status and reduce their need for preventable acute care services. Care managers with a clinical background in nursing, social work, health coaching, or pharmacy provide personalized, one-on-one support to help patients understand their medical conditions, navigate follow-up steps, and connect to other services for their behavioral health and health-related social needs. We present findings separately for the two main types of care management: (1) longitudinal care management, which provides long-term assistance to patients with chronic or ongoing health issues, and (2) episodic care management, which provides shorter-term assistance to patients with a new diagnosis or injury; an acute exacerbation of an existing condition; or, most commonly, a transition from a hospital or other facility.

5. Care delivery changes implemented under PCF and evidence that practices are making progress

a. Longitudinal care management

Longitudinal care management is a relationship-based activity between the primary care team and the patient (or caregiver) and focuses on patients with long-term health issues or complex needs (Innovation Center 2020). Practices provide longitudinal care management to patients who are most at risk of serious adverse health events, customizing care to help individual patients manage their conditions effectively.

Exhibit 5.1 lists the activities most commonly included in longitudinal care management programs. It also shows their hypothesized effect on short- and longer-term outcomes. Practices often use care managers to provide longitudinal care management. Longitudinal care management activities might include risk screenings to identify patients who could benefit from longitudinal care management; personalized care planning to ensure care aligns with each patient’s preferences, goals, and values; patient education to encourage self-management support; in-person or remote monitoring of patients’ conditions to identify red flags; and medication management. These activities fill important care needs and are intended to lead to better management of chronic conditions and improved health. CMS anticipates that better management of care needs will, in turn, lead to lower rates of acute hospital utilization, including potentially preventable hospital admissions and ED visits, and lower total Medicare FFS spending.



i. Care delivery changes

Many of the practices we interviewed reported that after joining PCF they took steps to improve the longitudinal care management activities they developed under previous models, such as CPC+. A few practices, however, none of which participated in CPC+, said that they used PCF supports to implement new longitudinal care management activities. These findings are consistent with data practices reported to CMS through the PCF portal.

"...in the past couple of years, we've really invested a lot of time in improving the processes and structure of how we're managing these patients and how we're supporting the patients."

— Care manager

Most commonly, the practices we interviewed described making changes to improve longitudinal care management by (1) standardizing processes to identify high-risk patients, (2) broadening the criteria for identifying patients who might benefit from longitudinal care management, (3) expanding their care management team, and (4) changing the physical location of the care manager.

"...initially, we were only looking at A1cs outside target and then blood pressures out of target. Now, we have more...social determinants of health, where they live, what background they have, do they have any support, language barriers, communication barriers."

— Medical lead

First, several practices, none of which participated in CPC+, described a shift from relying solely on practitioners' clinical judgment for referrals to using data-driven risk scores or quality metrics to identify patients who might benefit from longitudinal care management services. A few of these practices began generating reports of quality metrics from their EHR systems to identify patients for longitudinal care management based on their diagnoses, such as patients with an elevated A1c. Others said they began generating reports of ED and hospital utilization metrics, such as recurring hospital admissions, to identify patients.

Second, in addition to standardizing processes for identifying patients, several practices reported that they broadened the criteria for identifying patients who might benefit from longitudinal care management services.

This typically meant targeting patients with unmet social needs or certain chronic conditions, such as diabetes, hypertension, or heart failure. A few practices also started administering social needs screenings to identify patients to refer to longitudinal care management, and others began screening for social needs after patients were referred to longitudinal care management.

A few practices increased their efforts to enroll Medicare beneficiaries or patients attributed to the practice under another value-based program in longitudinal care management. These practices

"...initially, we would just have patients come in. This would just be something where we're like, this patient has a high risk, we need to make sure we're following them closely. Now we have a more structured program...in the EHR, where it's able to take a person's problem list, treatment, and basically...risk stratify these patients that have the high risk."

— Medical lead

reported that they do not restrict the provision of longitudinal care management services to these patients, but they made more of an effort to identify Medicare patients who met the practice's criteria for longitudinal care management than they had before PCF.

Third, expanding the practice care team, primarily by hiring additional clinical and non-clinical staff, was another change practices commonly reported in interviews and in the PCF portal to bolster their longitudinal care management services after joining PCF.

A few practices we interviewed reported that they hired registered nurses to fill the care manager role, and several practices reported that they hired unlicensed clinical staff, such as medical assistants, to take on administrative responsibilities as a way to free up care managers' time to focus on longitudinal care management services. A few practices reported that they hired staff to support longitudinal care management services, including physician assistants, clinical pharmacists, social workers, licensed practical nurses, and community health workers.

Evidence from PCF portal data

Among the 926 practices identified as focusing on longitudinal care management in their first year of participation in PCF:

- 91 percent reported improving or expanding care management processes to help patients manage their medical conditions between visits
- 67 percent reported adding medical assistants, nurses, or care managers

Finally, several practices described changing the physical location of care managers to integrate care management at the practice level or, conversely, to centralize care management within larger health systems. On the one hand, a few practices described moving existing care managers into the practice site—from a centralized location within the larger health system or from working remotely during the pandemic—so that they could provide longitudinal care management services to patients in person. On the other hand, a few practices reported that the larger health system decided to centralize their care managers, so they were no longer at the practice site and instead provided longitudinal care management services to patients across multiple practices by phone.

ii. Intended effects on outcomes

The longitudinal care management activities practices described as most helpful in potentially reducing acute care hospitalizations were related to expanding the care team. By hiring additional care managers, practices could follow up with patients more frequently and assess their social needs, educate them about care options, and encourage them to seek care proactively rather than waiting for an acute care episode to occur in a more frequent and timely manner. Several practices also explained that having a care manager helped identify and address patients' health risks, such as a high A1c, before they worsened and required acute

"I think [longitudinal care management] is definitely impactful because if [patients know] that I'm going to call them, they're more likely to follow through with their...medications, they're more likely to follow through with treatments, and that reduces their likelihood to be readmitted. So non-compliance goes down significantly with follow-through."

— Care manager

care. Others noted that efforts to identify and address their patients' health-related social needs helped them manage their chronic conditions more effectively, reducing unnecessary acute hospitalizations.

In addition, a few practices noted that longitudinal care management helped establish strong relationships between the primary care team and patients, increasing the likelihood that patients would reach out to the practice if they had a medical concern rather than go to the emergency room. A couple of practices explained that enrolling at-risk patients in longitudinal care management gave them an opportunity to educate them about their health care options and involve them in decision making about their care and treatment options. They said this improved patients' adherence to treatment and helped keep patients out of the hospital.

b. Episodic care management

Practices provide episodic care management (sometimes referred to as transitional care management) to patients with acute short-term health conditions whose health status is at high risk of worsening, particularly after transitioning home from the ED or a hospital inpatient or other setting, such as a skilled nursing or rehabilitation facility. Some practices provide episodic care management to patients seen in the practice for a new serious injury or diagnosis or acute exacerbation of an existing condition.

Exhibit 5.2 lists the activities most commonly included in episodic care management and shows their hypothesized effect on short- and longer-term patient outcomes. As described in the box on care delivery and other practice changes in the exhibit, practices rely on discharge notifications from hospitals and other facilities as well as risk stratification to identify patients at highest risk who could benefit from episodic care management. Care managers call patients soon after they transition home to review their discharge instructions and medications (often referred to as transition-of-care calls). Care managers follow and monitor patients for a few weeks or a few months to help them adhere to care plans and to assist with other care needs that are important to address for their recovery, such as obtaining medical equipment, social services, and behavioral health services. They also ensure that patients obtain timely follow-up visits with their primary care practitioner, who can further track patients' health status and adjust their care plans as needed. These care delivery activities help address patients' needs and manage their conditions so that they remain stable or improve. This results in a reduced likelihood of patients seeking care in the ED and potentially being admitted or otherwise requiring hospital admission.

Exhibit 5.2. Hypothesized effect of episodic care management on health outcomes

Hypothesis: Episodic care management will help meet the care needs of patients who have recently been discharged from the hospital or other facility (such as skilled nursing) or otherwise have short-term or newly exacerbated conditions. Timely follow-up and monitoring improves patients' transition to home and adherence to post-discharge care plans resulting in fewer ED visits, hospital admissions, and readmissions.

Care delivery and other practice changes

- Identifying patients through discharge notifications and risk stratification
- Calling patients soon after they leave the hospital or other facility to go over their discharge instructions and medications
- Following and monitoring patients over a few weeks or months to help them adhere to care plans; encouraging patients to call practice as needed
- Assisting patients with needs at home, such as obtaining medical equipment, social services, and behavioral health services
- Ensuring timely follow-up visits with patients' primary care practitioner

Implementation metrics

- Number of beneficiaries enrolled in care management

Beneficiaries' care needs are better met, and conditions are better managed

Leading indicators

- Transitional care management
- Follow up after hospital or ED visit
- Telehealth use
- Urgent care visits
- Observation stays

Beneficiary population outcomes improve

Reductions in:

- Primary outcomes
- Acute hospitalizations
 - Total expenditures
- Secondary outcomes
- Medical admissions
 - ED visits, including primary care substitutable ED visits
 - 30-day readmissions
 - Post-acute care expenditures

Contextual factors: Geographic region, urbanicity, practice size, health system affiliation, share of patients who are FFS Medicare beneficiaries, payer involvement in PCF, structure of payer alternative payments, socioeconomic status of patient population, population utilization and per-capita costs at start of model, and changes because of COVID-19 pandemic

ED = emergency department; FFS = fee for service; PCF = Primary Care First.

i. Care delivery changes

All practices we interviewed in this group reported making changes to their existing episodic care management programs after joining PCF. Most of these changes were subtle and involved enhancing or standardizing existing services and processes, but a couple practices added new services to their episodic care management programs to better monitor patients in their homes while they were at high risk of readmission. Practices expanded their capacity to provide episodic care management services through four main types of changes: (1) improving strategies to identify patients for episodic care management, (2) increasing timeliness and frequency of outreach and communication with patients, (3) increasing access through more primary care appointment slots and modalities, and (4) adding staff or redistributing responsibilities among existing staff.

"What [practitioners] were doing was referring patients who they perceived as problematic in their practice. Well, their perception was not always identifying the highest-risk patients, or patients who would actually benefit from care management. So, we had a lot of referrals which were just not of value to the patient."

— System lead

First, practices commonly reported in interviews and through the PCF portal an improved ability to identify patients who had recently been to the ED or were discharged from a hospital or other facility. Most practices interviewed described enhancing their processes to identify the patients who could benefit most from episodic care management through discharge information or through other assessments of patients' risk of readmission or hospitalization from a short-term or exacerbated chronic condition. For a few practices, new interoperability between their and other facilities' EHR systems enabled practices to more readily receive alerts that their patients had been discharged, such as through

automated discharge and transfer notifications. Although this change did not necessarily result in staff receiving discharge information on more patients, it saved time for staff who previously had to log in manually to other systems to retrieve the information.

A few practices expanded the network of hospitals and other facilities from which they received electronic notifications about patient discharges, which modestly increased the number of patients they identified for episodic care management. These practices proactively arranged with additional facilities to provide this information or they benefited from more general sharing of patient information through EHR interoperability among facilities. For example, one practice that previously received discharge data only from hospitals in its immediate area started receiving this information from hospitals statewide through its state health information exchange (HIE). Another practice gained access to discharge data for patients that use hospitals in a nearby state through enhancements in that state's HIE.

"We [now] get notifications when patients leave skilled nursing facilities, so we can really help with that transition from nursing facility to home and get them connected back to their primary care provider...Prior to [the integrated EHR, the process]...was very difficult to identify those discharges."

— Quality improvement lead

Several practices honed their use of risk score algorithms to better identify the patients at highest risk of hospitalization and then focused their episodic care management programs on those patients. One practice started using a new risk stratification model embedded within its EHR system that uses more than a dozen criteria to assign patients a score of high, moderate, or low risk. Another practice reported that its new risk model saved practitioners time by reducing the amount of time they spent manually reviewing patient information to select patients for episodic care management. It also made the assessment more objective. In some cases, particularly when faced with staffing constraints, practices became more restrictive in who they enrolled in episodic care management. For example, one practice increased the threshold risk score at which patients would be eligible for receiving episodic care management.

Second, practices commonly reported in interviews and through the PCF portal improving the timeliness and frequency of follow-up visits with patients after they were in the hospital and helping patients manage their conditions between visits to the practice. Most practices interviewed described how they began reaching out to patients sooner after a hospital discharge or a new diagnosis and monitoring their health more closely after the initial contact to address emerging issues quickly and before patients might otherwise go to the ED for help. Several practices formalized these efforts by standardizing their follow-up timeline. For example, one practice started requiring care managers to contact patients within 48 hours of discharge and book a follow-up appointment with their practitioner within 10 to 14 days. Several practices started conducting more persistent follow-up with patients in episodic care management, either reaching out to them more frequently or for longer periods.

Because care managers primarily interacted with patients via telephone, a few practices changed how they handled telephone calls and encouraged patients to contact the practice by phone as needed. Examples included providing patients with the direct phone numbers of care managers and collecting alternative contact information from patients in case the care manager was unable to reach the patients.

Finally, a few practices added new modes of communication, including sending letters to patients they could not reach by phone and enabling and encouraging text messaging with care managers. One practice implemented a new remote patient monitoring program that offers patients the option to use text messaging to schedule appointments, contact their care managers, and complete an assessment on

social support needs. Through this remote monitoring program, the practice also extended its communication with patients beyond the initial week or two after discharge to cover the 15 to 30 days after discharge when staff observed patients were at particularly high risk of readmission.

Third, many practices reserved or added new appointment slots to create more availability for patients receiving episodic care management to follow-up with their primary care practitioner. Those practices added same-day appointments by keeping some slots open in practitioners' schedules or, in a couple cases, limiting practitioners' patient panel size so that practitioners had more capacity to care for existing patients rather than take on new ones.

Several practices opted to add time to the standard length of their episodic care management follow-up visit appointment, which often decreased the number of patients they were able to see overall in a day.

Finally, practices commonly reported in interviews and through the PCF portal that they added staff to support care management. Many practices interviewed described making staffing changes to enhance their episodic care management processes. Some practices hired dedicated staff to focus solely on episodic care management, improving practices' ability to follow up with patients in a timely and routine manner. Similar to practices focusing on longitudinal care management, in several cases, practices hired other types of staff so that care managers could focus on patient communication and care. For example, one practice hired more medical assistants who fulfilled certain administrative duties previously conducted by care managers, allowing the care managers to dedicate their time to outreach for episodic care management. Several practices shifted responsibilities from practitioners to care

Evidence from PCF portal data

Among the 721 practices identified as focusing on episodic care management in their first year of participation in PCF:

- 58 percent reported improving or expanding their ability to be notified when a patient has a hospital discharge or ED visit
- 83 percent reported improving or developing new processes to systematically follow-up with patients after a hospital discharge or ED visit
- 78 percent reported improving or expanding care management processes to help patients manage their medical conditions between visits
- 51 percent reported adding more medical assistants, nurses, or care managers

"We have story after story that we could share with people in terms of where just sometimes a phone call check-in could stop a hospitalization. Or making sure someone has received...the right antibiotic has stopped hospitalization."

— Practitioner

managers and other support staff to allow practitioners to focus more of their time on responding to patients' clinical needs. For example, one practice incorporated discussion of care gaps into the episodic care management outreach calls to allow time for more topics to be covered during the follow-up visit with the practitioner.

ii. *Intended effects on outcomes*

Practices explained that enhancing their episodic care management services would reduce readmissions and other acute hospital utilization by ensuring that patients understand and adhere to their discharge instructions, making sure patients receive the care and equipment they need to remain stable and improve,

"People aren't well when they're discharged; they're better, but they're not well. [An initial outreach call] helps [care managers] determine where they are on that path to wellness and determine how often they need follow-up calls."

— System lead

"A lay person with some medical background [helps] fill in the gaps with care coordination. So, for example, this group in our clinic heavily works with patients' durable medical equipment needs, prior authorizations for things like that."

— Medical lead

and being available to patients when health concerns arise. Practices thought these three pathways helped foster a connection between the practice and the patient that alleviates patients' anxiety about their condition, makes patients feel cared for by the practice, and builds trust in the care manager and the practice so that patients engage with and rely on the practice rather than the hospital.

First, discharge instructions can be overwhelming and confusing for patients and caregivers who have been ill; they might not know they have questions until they arrive home. By contacting patients soon after discharge, care managers answer patients' questions and reinforce the instructions. As one practice explained, even brief outreach calls can reassure the patient that their primary care practitioner agrees with discharge instructions written by hospital providers and staff whom the patient does not know as well and might not trust. These interactions also help identify and address what the patient might not have at home to bridge the gap between the discharge plan and the reality for the patient. As one practice manager described, care managers "make sure that what needs to happen happens," especially that patients receive the medications and services they require, such as home health and durable medical equipment. As a result, patients are more likely to adhere to their discharge instructions.

Second, through ongoing interactions with patients over a few weeks or months after their transition home or after a new diagnosis or exacerbation of an existing condition, care managers can readily track and address patients' physical and emotional needs. By listening to the patients and asking questions, care managers educate the patient on their condition, gauge their situation and progress, and elevate issues to the practitioner or other practice staff (such as social workers) as necessary. By ensuring that follow-up visits with the practitioner happen, care managers also help patients stay on track and identify any emerging health issues. As a result, patients receive the services they need over time and become engaged in their care to remain stable or improve.

Third, by being readily available to patients, care managers create an open door that encourages patients to contact them so they can quickly address emerging issues. One practice gave an example of a patient recently discharged from the hospital who worried his leg pain was a deep vein thrombosis. Because of the relationship the care manager had established with him, he contacted the practice and the care manager assessed his situation and assured him that urgent care could address the problem. As a result of strong patient–care manager communication, patients are less likely to turn to the ED as their default or only option, which often results in their being admitted.

"I think following-up with [patients] and giving them that motivation and letting them know, hey, you're not alone [is important]. If you need me to call you more frequently, or if you need more help, always feel free to reach out."

— Care manager

2. Comprehensiveness and coordination

Comprehensiveness increases the breadth and depth of primary care. Coordination helps to better integrate and facilitate care from specialists, some of which occurs outside the primary care setting. In the PCF Model, comprehensiveness focuses on two activities to increase the scope of care (behavioral health integration and addressing health-related social needs), and coordination emphasizes specialty care coordination with medical specialists. We present the findings for comprehensiveness and coordination separately because they are different concepts and, though one affects the other, involve different primary care delivery changes. Almost all the practices in this group reported through the PCF portal that they were making changes in the comprehensiveness and coordination of care, and most of the practices we interviewed reported implementing multiple strategies to improve comprehensiveness and coordination.

a. Comprehensiveness of care

Under the PCF Model, CMS defines comprehensiveness as expanding the services practices provide to address their patients' behavioral health and health-related social needs. The causal pathways for behavioral health and health-related social needs (shown in Exhibits 5.3 and 5.4, respectively) share many of the same activities and operate in similar ways to reduce acute hospital utilization.

Exhibit 5.3 lists the activities most commonly included in behavioral health integration and shows their hypothesized

effect on short- and longer-term patient outcomes. As described in the box on care delivery and other practice changes in the exhibit, practices screen patients for behavioral health issues (such as anxiety and depression) and refer those patients to behavioral health services. CMS envisioned practices would

CMS envisioned practices would use one of two evidence-based models of behavioral health integration

Primary Care Behaviorist Model. A behavioral health specialist (a licensed clinical social worker or psychologist) is on site at the primary care practice to provide time-limited therapy for patients with behavioral health needs.

Care Management for Mental Illness Model. Practices use a care manager with behavioral health training to support on-going care management of patients with behavioral health needs.

Source: 2020 PCF Care Delivery Interventions Guide.

5. Care delivery changes implemented under PCF and evidence that practices are making progress

use one of two evidence-based models of behavioral health integration to support patients' behavioral health needs within the primary care practice (see the text box called CMS envisioned practices would use one of two evidence-based models of behavioral health integration). Practices also train or hire care managers and behavioral health staff, connect patients with behavioral health services in the larger health care system or the community if necessary, and engage patients and caregivers in treatment planning to help address patients' longer-term behavioral health needs.

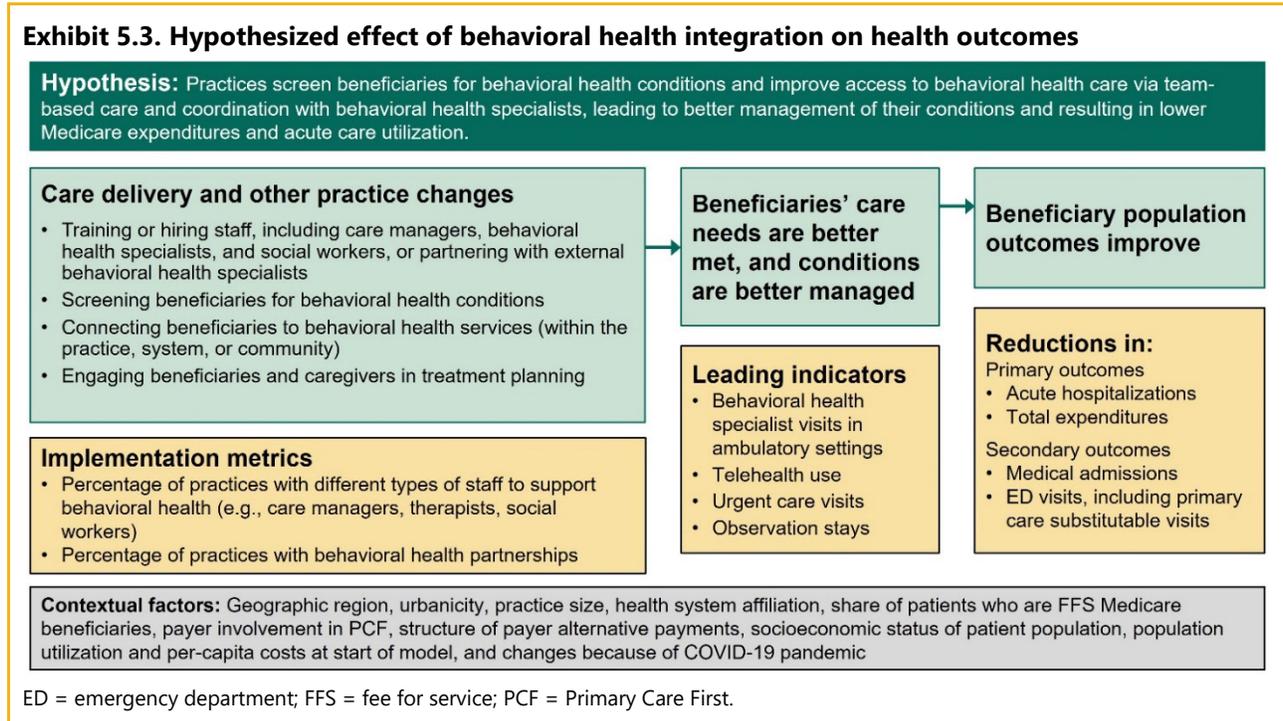
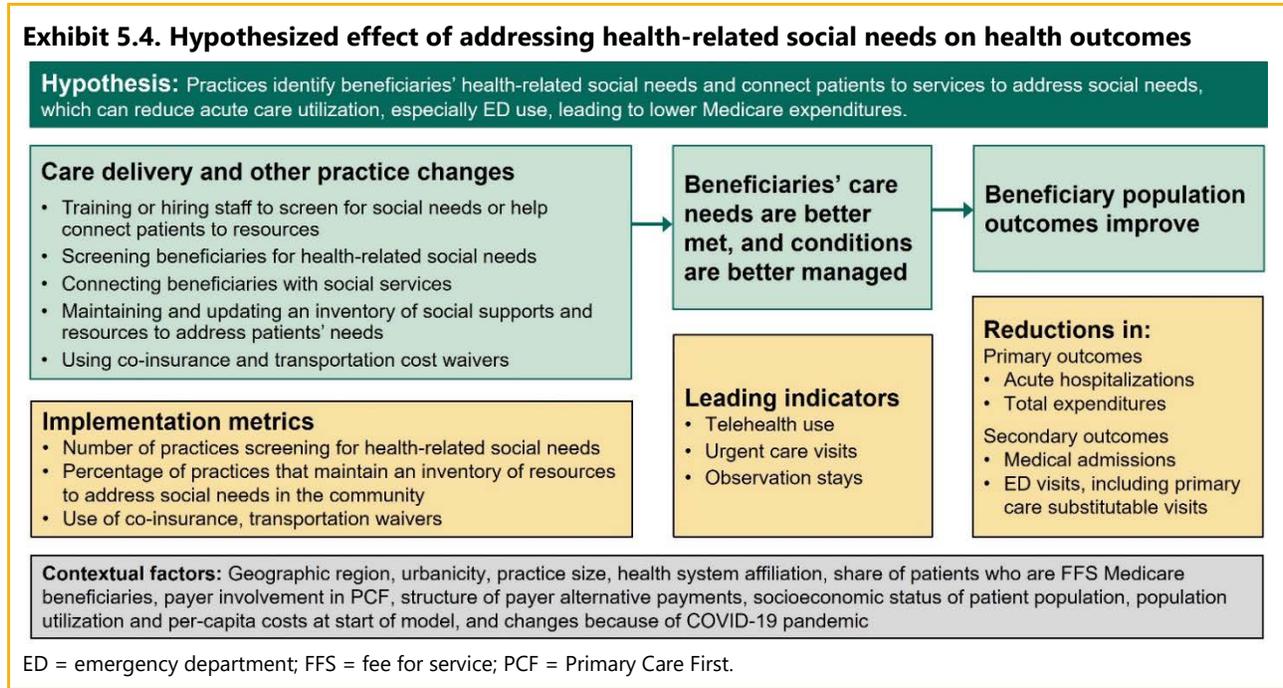


Exhibit 5.4 lists the activities most commonly included in addressing health-related social needs and shows their hypothesized effect on short- and longer-term patient outcomes. As described in the box on care delivery and other practice changes in the exhibit, practices screen patients for health-related social needs (such as lack of transportation, unstable housing, and food insecurity), and connect patients with the social services they need. Practices also maintain and routinely update lists or inventories of community resources to which they refer patients and train or hire staff to support screening and connecting patients to resources.



i. Care delivery changes

Practices reported expanding the comprehensiveness of primary care in four ways: (1) increasing screenings for behavioral health and health-related social needs, (2) expanding staff capacity to address those needs, (3) strengthening community referral networks to augment the services available in the primary care setting, and (4) integrating EHR data to support screening and referrals. Most changes, though not all, represented modifications to existing processes, but a few practices implemented new activities.

First, many practices increased screenings for behavioral health and health-related social needs by (1) expanding the types of patients who receive screenings, (2) increasing the frequency of routine screenings, or (3) changing screening tools and questions. Several practices reported expanding the types of patients who received screenings for behavioral health and health-related social needs. For example, a few practices reported that before PCF they only screened patients exhibiting behavioral health needs, but after joining they began screening all patients regardless of exhibited need. Several practices also expanded from screening only Medicare patients or patients enrolled in longitudinal care management to screening all patients. Other practices increased the frequency of screenings by moving from ad hoc screenings only to routinely screening all patients at least once per year.

"In the past, we probably screened when we saw a need for it in the patient. Now, with the PCF program, we are screening more routinely whether a patient is displaying a need or not, and we are picking up more needs on people that really aren't displaying it until we're asking the questions."

— Care manager

In addition, practices reported adding new screening tools, adding new questions to existing tools, or changing their screening tools in other ways. A couple practices added new questions on health-related social needs to screening forms they already used—either adding questions into existing health-related screening tools or adding questions to the practice’s general risk assessment tool or behavioral health screening tool. A couple other practices changed their behavioral health screening tools by switching from the PHQ-9 to the PHQ-2 depression screening tool to shorten the length of time it takes to screen patients.

Second, several practices reported expanding staff capacity to address their patients’ behavioral health and health-related social needs by (1) hiring new staff, (2) enhancing the roles of existing staff, or (3) providing additional staff training. Several practices hired new staff such as social workers, patient navigators, and community health workers, and a few practices hired clinical behavioral health staff. A few other practices instead expanded the roles of existing staff. For example, a few system-affiliated practices reported that their health care system administrators expanded the roles of system-level staff to provide health-related social needs screenings and referrals, which freed up time for local practice staff to focus on patient care. A few practices provided their staff additional training on health-related social needs, focusing on active listening techniques or guiding them on how to discuss sensitive topics with patients.

Third, most practices reported strengthening external referral relationships. Only a few practices described implementing processes consistent with CMS’ definition of behavioral health integration by tasking behavioral health specialists in the primary care setting to provide time-limited therapy (see the text box called CMS envisioned practices would use one of two evidence-based models of behavioral health integration). Instead, most practices relied on external providers to address behavioral health and health-related social needs and worked to strengthen their referral relationships with them. Several practices we interviewed—and more than 80 percent of practices in the PCF portal—reported that they developed or updated their list of community resources to address their patients’ health-related social needs, and most said they routinely update these lists over time. A few practices reported also forming new partnerships with external providers to increase access to behavioral health services in the community.

Fourth, practices reported changing how they used their EHR systems for screening and referrals for behavioral health and health-related social needs.

Several practices reported integrating the behavioral health and health-related social needs screening tools into their EHR system, which allowed them to record and store screening data electronically. A few practices also updated and embedded lists of providers and community resources into the EHR system to allow electronic referrals to providers or community resources. A few practices reported tracking referrals in the EHR to ensure that

“Yes, we did do [HRSN screenings] on paper at one point, and now it’s in the EHR. And I would just say, because it’s just right in front of you every time you open the chart, I feel like it’s more accessible and noticeable and obvious to all the care team members...When you open up someone’s chart, it’s big and bold and right in front of you. And so you can see any deficiencies and whatever you may need to follow up on.”

— Nurse

patients received the necessary services. Another practice updated its EHR system to match patients with community resources based on their symptoms or the level of care they needed. Practices also improved their ability to track referrals in their EHRs; for one practice, capturing the number of referrals led them to hire more providers to keep up with the demand for behavioral health.

ii. *Intended effects on outcomes*

Practices reported that screening for behavioral health and health-related social needs helped them identify patients' needs and risk factors and provide patient-centered care.

Addressing these needs, in turn, improves patients' ability to adhere to care plans, medications, and recommendations for their medical conditions, which should improve patients' overall health and avoid acute hospital utilization. Practices noted that unaddressed behavioral health and health-related social needs impede patients' ability to access medical care, can compromise their overall health, and might result in primary-care-preventable hospitalizations and ED visits. For example, a couple practices said that providing transportation to appointments at the practice can reduce ED visits and acute care hospitalizations because patients lacking transportation are more likely to call an ambulance to take them to the ED when they need care.

A couple practices also reported that screening for and addressing behavioral health needs in the primary care setting might not only improve patients' overall health but also prevent hospitalizations and ED visits for behavioral health conditions. Screening for behavioral health conditions in the primary care practice provides another opportunity for providers to identify behavioral health issues early on, manage these issues more effectively, and address behavioral health symptoms before they require an acute intervention. For example, these practices reported that identifying and managing behavioral health issues earlier might prevent behavioral health issues from escalating to more serious symptoms, such as suicidal ideation and physical manifestations of depression, which can result in a hospitalization or ED visit.

Evidence from PCF portal data

Among the 415 practices identified as focusing on comprehensiveness and coordination in their first year of participation in PCF:

- 78 percent reported increasing screening for patients' social needs
- 81 percent reported improving coordination with community resources to meet patients' social needs
- 46 percent reported adding behavioral health staff or in some other way enhanced behavioral health integration at the site
- 96 percent reported making changes in the comprehensiveness and coordination of care
- 71 percent reported hiring more medical assistants, nurses, or care managers

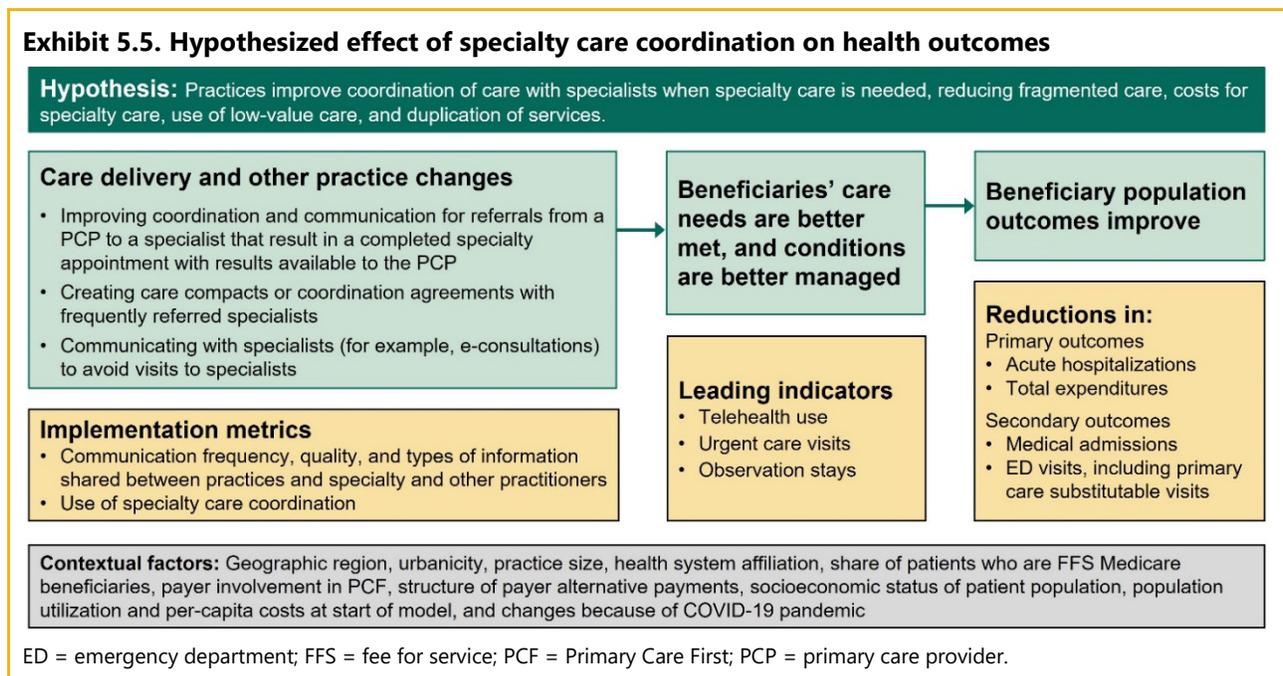
"Anxiety can precipitate in psychosomatic symptoms. The patient easily can get chest pain, go to ER, [and find that there is] nothing there. Guess what? There's a couple of thousand dollars of bills which could have been prevented. So, it also results in preventing a lot of ER visits."

— Primary care physician

b. *Coordination of care*

Coordination of care, also referred to as specialty care coordination, refers to the work of bridging the gaps in information among the various providers who treat a patient to improve outcomes. Primary care practices coordinate with medical specialists to help patients and caregivers navigate specialty care.

Exhibit 5.5 lists the activities most commonly included in specialty care coordination and shows their hypothesized effect on short- and longer-term patient outcomes. As described in the box on care delivery and other practice changes in the exhibit, practices improve coordination and communication for referrals with specialists by tracking and monitoring referrals and creating care compacts or coordination agreements. Practices also communicate with specialists through the use of e-consultations to avoid visits to specialists.



i. *Care delivery changes*

In this group, nearly all practices we interviewed—and three-quarters of practices in the PCF portal—reported changing how they coordinate with medical specialists in three ways: (1) expanding the use of EHRs to better communicate with specialists and track referrals, (2) hiring new staff and reallocating staff assignments to make and track referrals, and (3) developing formal collaborative care agreements with specialists. In all cases, practices noted that these changes were relatively minor and built on existing processes; these changes were also accompanied with larger changes to comprehensiveness activities.

First, most commonly, practices reported expanding the use of their existing EHR systems to communicate with specialists by increasing the frequency of EHR use or adding new features to their EHR system. Several practices that previously communicated with specialists by telephone, by fax, or face to face began using their EHR systems more frequently to coordinate with specialists. A few other practices gained the ability to view their patients’ medical specialty records by adding new features to their system. These changes allowed practices to more easily communicate with specialists

and hospitals and track referrals to ensure patients see the specialist they were referred to. They also allowed specialists to share their notes with the primary care practice. In addition, a few practices added chat features to their EHR systems to improve communication with specialists and patients, making it easier for practitioners to discuss patient needs with specialists and allowing patients to notify practitioners when specialists do not follow up with them.

Second, a couple practices reported hiring new staff or shifting responsibilities to improve their referral tracking process and enable staff to connect patients with specialists faster.

These staffing changes included hiring more full-time medical assistants to help refer patients to specialists and follow up with specialists to ensure the patient was seen. A couple of system-affiliated practices said they shifted referral responsibilities to a system-level coordinator to free up staff time in the practice.

"In the past, it was me doing that on top of everything else. So, it's very helpful to have someone to facilitate making sure that the specialists receive all of the information that they need in order to see the patient... On the whole, I would say that the referrals get to the specialist's office much faster since we had the coordinator, which then, theoretically, allows the patient to be seen by the specialist faster."

— Care manager

Third, a couple practices made changes to

formal care agreements with specialists, otherwise known as care compacts or collaborative care agreements.

Collaborative care agreements are formal documents between primary care and specialists that establish clear and agreed-upon expectations regarding communications and clinical responsibilities with specialty practices. They typically include defining the types of referrals, consultations, and co-management arrangements. They also specify who is responsible for which processes and outcomes within the referral, consultation, or co-management arrangement, what clinical information should be provided, how the information is transferred, and timeliness expectations. One practice updated its existing care compacts with medical specialists to extend the timeline of the agreements and cover additional providers. Another practice prepared to enter into a new formal collaborative agreement with a medical specialist who serves patients with heart disease and diabetes.

ii. Intended effects on outcomes

Practices reported that having timely access to specialist appointments—as well as clinical notes and test results from medical specialists—helped primary care providers make diagnostic and treatment decisions sooner.

Practices explained that being able to secure patient access to outpatient specialty appointments and tests before an exacerbation prevents patients' conditions from worsening and requiring

hospitalization. For example, one primary care practitioner noted that helping a patient schedule an appointment with a cardiologist as soon as the patient comes into the primary care clinic with chest pain might prevent the patient from later going to the hospital for a heart attack.

Evidence from PCF portal data

Of the practices that categorized as focusing on comprehensiveness and coordination:

- 61 percent reported that they improved coordination with medical specialists

3. Activities in other primary care functions

We asked practices in risk groups 1 and 2 to describe the changes they made under PCF in 2022 specific to the two primary care functions most commonly cited in round one data collection to reduce acute hospitalizations (care management and comprehensiveness and coordination). Our interviews found, however, that the two functions do not operate in silos to improve health outcomes. Exhibit 5.6 describes several activities that practices implemented in the other three primary care functions cited in the 2020 PCF Care Delivery Interventions Guide: (1) access and continuity, (2) patient and caregiver engagement, and (3) planned care and population health.

Exhibit 5.6. Practice activities in other primary care functions

Other primary care functions

Access and continuity

- Expanded clinic hours and reserved same-day appointments to accommodate when patients at risk of serious adverse events needed to see their primary care practitioner soon
- Added staff, such as medical assistants, to expand overall practice capacity and increase the time practitioners can spend in clinical care
- Increased use of telehealth to conduct patients' follow-up visits with their primary care practitioners and connect patients with behavioral health providers
- Fostered the use of patient portals to help patients schedule appointments and communicate with their care team
- Upgraded health IT infrastructure to support referrals, guide treatment, and facilitate communication among practitioners

Patient and caregiver engagement

- Enhanced efforts to educate patients on their conditions to promote self-care and help them manage their conditions
- Enhanced processes to engage families, caregivers, and patients formally or informally, such as through improved Patient and Family Advisory Councils or surveys to collect patient feedback on care management services

Planned care and population health

- Monitored electronic clinical quality measures to identify gaps in care (through screenings and tests) to help monitor and stabilize patients' conditions
- Implemented dashboards to identify patients with high utilization and intervene with care management or other activities

D. Care delivery changes among practices in risk groups 3 and 4

Here, we turn our attention to practices in risk groups 3 and 4, a group that serves patients with serious and complex health needs. In 2022, only 3 percent (68) of all PCF practices were in risk groups 3 and 4 (30 in Cohort 1 and 38 in Cohort 2). The eight practices we interviewed in these risk groups for round two data collection represented a diverse group with wide-ranging levels of experience and resources to change care delivery. These practices represented different care settings for patients with complex health care needs, including three independently owned community-based practices, two practices in large academic medical systems, two home-based care providers, and one practice embedded in a continuing care residential community.

Practices in risk groups 3 and 4 reported providing individualized, holistic, and comprehensive care to patients with complex care needs even before joining PCF. Based on our interviews with practice

administrators, clinicians, and staff (corroborated by the information practices submitted to CMS through the PCF portal), this high-touch approach involved frequent encounters and communication with patients identified as being at high risk for acute hospitalization, combined with an approach to meet patients' needs with integrated wraparound services. This approach included many of the primary care functions associated with PCF (such as longitudinal and episodic care management, comprehensive care such as integrated behavioral health services, and care coordination) before joining the model. Practices emphasized that they applied changes made under PCF to all patients identified as high risk regardless of the payer.

1. Care delivery changes

Changes to care delivery by Cohort 2 practices in risk groups 3 and 4 in 2022 were primarily modifications or enhancements of existing strategies. These changes fell into five care delivery categories: (1) improvements in population health activities, (2) expansion of access to care, (3) enhancements to care management approaches to risk stratification, (4) improvements in comprehensiveness and coordination of care, and (5) patient education and engagement.

"Challenges [found in the data] are welcome because it questions your practice and it allows you to be able to improve where you see there's a need for improvement. And all of our staff and physicians have been very positively moved about that."

— Physician

First, most practices reported implementing changes to their population health activities, such as expanding or upgrading their quality metric dashboards, identifying care gaps for groups of high-risk patients, and revising their workflows to address these gaps. To address their patients' population health needs, many practices said they scaled up, expanded, or improved the use of dashboards with clinical quality metrics (such as uncontrolled hypertension or hemoglobin A1c monitoring) for use by staff and practitioners. Two other practices said they rolled out new dashboard platforms to support their quality goals and better identify gaps in care. To address care gaps, practices described revising workflows and having dedicated staff (usually medical assistants) reach out to patients with care gaps to schedule appointments or increase practitioners' use of reports that highlight existing care gaps. The portal data reflected this focus on upgrading their dashboards and identifying gaps in care.

Second, most practices reported making changes to expand patients' access to care and care continuity, including adding staff, increasing or modifying clinic hours, expanding the use of telehealth, and streamlining patient communications. To increase access, many practices reported in interviews and via portal data that they had hired new clinical staff, including mid-level practitioners (such as nurse practitioners or physician assistants), to increase available appointments and non-clinical staff to support care coordination and patient outreach. For example, two practices hired nurse practitioners to increase the number of available appointments so that high-risk patients seeking appointments can be seen the same day. Similarly, practices described hiring licensed practical nurses and medical assistants

"If you don't have continuity of care, you're not going to really advance the ball much in care."

— Care manager

for other positions such as care coordinators to expand on-site care coordination and patient outreach. Increasing the number of nonpractitioners on staff helped with scheduling, increased availability for patients calling the office, and assisted patients with accessing community resources and specialist referrals. Several of the practices said they already provided expanded access to care via home visits.

Two of these practices provided exclusively home-based care: one practice was located at a residential facility and had a rapid response team, and the other offered home visits to especially sick patients. Neither practice changed these home-care services after joining PCF.

In addition, several practices reported expanding access to care through extended clinic hours, same-day or walk-in clinics, and increased telehealth use. Several practices noted that although telehealth use was not popular among their patients (who were mostly elderly), they maintained the option after COVID-19 pandemic's peak but also added more in-person appointment availability. These changes are reflected in the portal data as well. Several practices implemented changes to streamline communications with patients, enhancing their access to the practice for care management, care coordination, and other supports outside of face-to-face visits. Examples included implementing the ability to triage incoming calls by individual patient risk level using the EHR system, creating a direct phone line for high-risk patients, and having staff reach out directly to patients to assist with scheduling.

Third, the two large system-owned practices implemented centralized system-level care management structures located outside practices to provide longitudinal care management. These

centralized approaches coincided with and were supported by the implementation of system-wide population health IT platforms and revised risk stratification approaches. Under these changes, systems could staff and supervise care management programs to accommodate the increased time needed for managing the care of high-risk patients. Two smaller, independent practices made less significant

Evidence from PCF portal data

Among the 38 Cohort 2 practices in risk groups 3 and 4:

Improving population health

- 84 percent reported increasing the use of data to improve care delivery in 2022

Expanding patient access and continuity

- 63 percent reported adding more practitioners
- 69 percent reported increasing patients' access to practitioners via billable care (such as extended hours or home visits)

Care management

- 79 percent reported improving or expanding care management processes to help patients manage medical conditions between visits
- 73 percent reported improving follow-up care with patients after hospital discharge or ED visit

Comprehensiveness and coordination

- 60 percent reported improving coordination with specialists
- 55 percent reported enhancing integrated behavioral health services (for example, by adding behavioral health staff)
- 68 percent reported increased screening for patients' social needs
- 77 percent reported improving coordination with community resources to meet patients' social needs

Patient education and engagement

- 90 percent reported providing education for patients and caregivers about alternatives to the ED

changes, hiring additional staff to serve in a hybrid care coordination and episodic care management role. Practices in risk groups 3 and 4 reported these changes in care management approaches in the portal data.

Many practices also reported developing new or refining existing risk models or risk stratification approaches to better identify high-risk patients for care management and other services. Several practices reported introducing new tools (for example, software platforms including algorithms to determine patient risk levels) to support risk stratification. Several system-owned practices described changes to risk stratification approaches at the system level and use of these risk models at the practice level to decide how to allocate their care management and other wraparound services among patients.

"I think the providers, the clinicians, the staff have always been saying, 'Our patients are so much sicker, their needs are so much longer.' And people heard it, but they weren't resourcing it to that level or didn't know how to really measure it. And the fact that we could actually measure it [under PCF]... I think that clinic's experience has been hugely beneficial through this program, to get attention."

— System administrator

Fourth, practices in risk groups 3 and 4 shared that they also made several modifications to comprehensiveness and coordination of care activities that were already part of the holistic approach to care provided prior to joining PCF. Several practices modified how they coordinated care with medical specialists (for example, by improving communication with specialists or refining their specialist referral network). Several practices described expanding the integration of behavioral health services by expanding screening or documentation for behavioral health needs, and two practices reported adding clinical social workers to provide integrated behavioral health services. Finally, many practices said they increased their attention to their patients' health-related social needs. For example, two practices hired new staff to help connect patients with resources. Others described focusing attention on health-related social needs during clinical practice or care management through training or resources (such as referral databases) for staff to use with patients. The portal data findings corroborate the modifications practices made to the activities they offered before PCF.

Finally, to boost patients' use of expanded access capabilities, practices turned to patient education and engagement about how and when to access care. Several practices added patient education and engagement efforts, such as ongoing education during encounters about appropriate use of ED services or written instructions and contact information on who to contact in urgent situations (for example, urgent care facilities, 24-hour nurse lines) to reduce ED utilization. These changes were reflected in the portal data practices provided.

2. Intended effects on outcomes

Practices in risk groups 3 and 4 used PCF supports to modify existing care delivery with the goal of reducing unnecessary or preventable acute care utilization and thus reducing total per-capita cost of care. Practices in risk groups 3 and 4 expected their changes to reduce acute hospital utilization and total per-capita cost of care by (1) expanding primary care access as an alternative to using the ED for

5. Care delivery changes implemented under PCF and evidence that practices are making progress

nonemergent care; (2) improving care management approaches, including refining risk stratification to identify patients with a history of frequent ED utilization; (3) using population health activities to identify and close care gaps for high-risk patients; and (4) building on existing primary care functions (such as care management or coordination) to better meet the needs and manage chronic conditions of high-risk patients.

First, practices anticipated that expanding patients' access to clinical appointments and simplifying access to clinic staff (for example, via direct access phone lines to dedicated staff) would contribute to fewer ED visits because patients would be able to first seek medical assistance from their primary care practitioner. To reinforce this behavior, clinic staff would communicate with and educate patients about the importance of contacting the practice with concerns before going to the hospital for emergency care.

Practices hope to have a direct effect on the number of ED visits for primary care-preventable conditions through better targeting of high-risk patients for services such as care management or care coordination. Practices anticipated that improvements in risk stratification and population health could enable providers and staff to focus on and work with patients most at risk of high utilization (for example, those with a history of frequent ED use or significant gaps in care).

Finally, practices in risk groups 3 and 4 said they were already providing many primary care functions (such as care management including more frequent visits) to prevent acute care use before joining PCF, and they anticipate that these functions, enhanced and more focused under PCF, could further reduce the risk of high-cost service utilization. For example, most practices reported seeing or checking in with patients identified as high risk more frequently than other patients, and all practices had care management activities for these patients woven into their encounters and appointments.

"And so [with PCF], there are a lot of things you're trying to have influence over. You're trying to influence patients' behaviors and behaviors of specialists. Within [primary care] we do consider costs, but we're not the main source of cost when it comes to health care."

— System administrator

"If somebody screens positive for two or more [social determinant of health] needs or housing alone or transportation alone, then a little box pops up and says, 'This patient needs a social work or community work referral.' And with one click of the button, they can say yes, let's do that. So, just making it super easy for the provider to recognize that their patient had a [positive] screen."

— System administrator

Although practices said they anticipated these care delivery changes would reduce acute hospital utilization and costs, several expressed concern that a lack of influence over the main cost drivers for their medically complex patient population limits their ability to reduce total cost of care. They explained that primary care has limited control over the costs of the numerous specialists, specialty services, and hospital-based services that complex patients receive for their multiple chronic conditions.

E. Evidence of early effects

Nearly all practices in risk groups 1 and 2 in both cohorts said they expected the changes they made under PCF would reduce acute hospital utilization and total per-capita cost of care, and only those expanding or strengthening their episodic care management programs reported readmissions or general acute hospital utilization declined after they started making changes. But because most of these practices implemented their episodic care management programs before joining PCF, we cannot necessarily attribute the self-reported decline in acute hospitalization utilization to changes implemented under the model. A few practices anticipated that acute hospitalization utilization would start to or continue declining during the remainder of PCF as a result of the changes to their episodic care management programs after joining the model.

Cohort 2 practices in risk groups 3 and 4 reported during interviews they have not yet seen any change in total per-capita cost of care, although some said they have seen reductions in acute care utilization, such as ED visits and hospital readmissions. Many of these practices anticipated that it would take a year or more to see evidence of reduced total per-capita cost of care because their interventions affected patient and practitioner behaviors gradually. They noted that decreases in costs might be limited by the smaller scale of some changes that built on prior care improvements.

To quantitatively assess the early effects of the changes in care delivery that Cohort 1 practices had made by the end of their second year of participation in the model—and that Cohort 2 practices had made by the end of their first year of participation—we estimated impacts on the leading indicators previously listed in Exhibits 5.1 to 5.5. Leading indicators provide an early signal of whether changes are (or are not) occurring in a manner that is consistent with the expected causal mechanism. These leading indicators, derived from Medicare administrative data for treatment and comparison groups, reflect expected changes that will follow changes in practice care delivery activities discussed in this chapter.

Estimating impact on leading indicators

We used a difference-in-differences regression model to estimate impacts on leading indicators during the first two performance years of the model for PCF practices, relative to their matched comparisons. This method estimated impacts of PCF as the difference in outcomes observed between PCF and comparison practices, minus any difference in outcomes that existed between those same practices before PCF started, adjusting for differences in practice and beneficiary characteristics (such as practice size or age distribution patient panel). See Appendix A.2.6 for details on our estimation strategy.

According to the hypothesized casual pathways (and as listed in Exhibit 5.7), all five of the primary care activities (longitudinal and episodic care management, integration of behavioral health, addressing health-related social needs, and coordination with medical specialists) are expected to increase telehealth visits and decrease urgent care center visits and observation stays. The other five leading indicators align with specific primary care activities: (1) longitudinal care management is hypothesized to increase adherence to medications for multiple chronic conditions and decrease use of high-risk medication; (2) episodic care management is hypothesized to increase the number of transitional care management services and follow-up services after discharge; and (3) behavioral health integration is hypothesized to increase behavioral health specialist visits in ambulatory settings.

There is limited evidence to date to indicate that the changes implemented during the first two of years of the model (and described in this chapter) have led to a substantial improvement in these leading indicators—measures that one would expect to see improve if the model is to lower acute hospitalizations and total per-capita cost of care, at least when compared with similar practices not participating in PCF. (Exhibit 5.7

provides a summary of the quantitative results, with additional detail in Appendix B.11) There was a small and statistically significant estimated *favorable* impact in the two leading indicators associated with longitudinal care management: an increase in

adherence to medications for chronic conditions and a decrease in use of high-risk medications. The estimated impact on use of high-risk medications remained favorable and statistically significant in the second year of participation (which includes Cohort 1 practices only). The other favorable effect for longitudinal care management (adherence to medications for chronic conditions) occurred in the first year of participation only (which includes practices in Cohorts 1 and 2). Finally, there is a small and statistically significant unfavorable estimated effect on one of the two leading indicators associated with episodic care management: a decrease in billable post-discharge visits in Year 1. Because we observe only billable services in claims data, we cannot determine whether practices increased (or decreased) the number of nonbillable services for follow-up care delivered during this period.

Several factors could explain the absence of stronger quantitative evidence of improvements in leading indicators during the first two years of the model:

- First, because most of the changes that practices made represented relatively minor modifications, refinements, or expansions to existing care delivery activities they initiated before joining PCF, further improvement in these leading indicators might be difficult to achieve in the first two years of the model.
- Second, practices in PCF have pursued a range of changes in different care delivery functions and activities, not all of which are expected to affect the same early outcomes, making it challenging to observe effects when measured over all practices combined.
- Third, making meaningful changes in patient and provider behavior takes time and might require a longer period to see sustained improvements even in early indicators.
- Fourth, it is difficult to disentangle changes that occurred because of PCF versus those that might have been implemented in the absence of the model.
- Finally, the leading indicators reported in this chapter are limited to measures observable in Medicare FFS claims; early signs that practices have made progress along the causal pathway of their primary care function might be more evident in non-billing data, such as the range of concerns discussed during care management visits or the type of issues identified and addressed through behavioral health and health-related social needs screenings.

How the two leading indicators with favorable effects might reduce acute hospitalizations

1. Increased adherence to medications for beneficiaries on multiple medications can reflect care management strategies designed to improve care and might reduce acute hospitalizations.
2. Use of high-risk medications among older adults can decline with medication reconciliation and care management strategies, leading to better care and reduced acute hospitalizations.

5. Care delivery changes implemented under PCF and evidence that practices are making progress

Exhibit 5.7. Estimated percentage impact of PCF on eight leading indicators associated with one or more of five main primary care activities

Leading indicator	Direction of hypothesized change	Percentage impact		Longitudinal care management	Episodic care management	Behavioral health integration	Addressing health-related social needs	Specialty care coordination
		Year 1	Year 2					
Telehealth use (per 1,000 beneficiaries per year)	↑	<-1%	-2%	•	•	•	•	•
Urgent care center visits (per 1,000 beneficiaries per year)	↓	<-1%	2%	•	•	•	•	•
Observation stays (per 1,000 beneficiaries per year)	↓	<1%	<-1%	•	•	•	•	•
Proportion of elderly beneficiaries experiencing high-risk medication use	↓	<-1%*	-2%**	•				
Proportion of eligible beneficiaries who adhere to medications prescribed for multiple chronic conditions	↑	<1%**	<1%	•				

5. Care delivery changes implemented under PCF and evidence that practices are making progress

Leading indicator	Direction of hypothesized change	Percentage impact		Longitudinal care management	Episodic care management	Behavioral health integration	Addressing health-related social needs	Specialty care coordination
		Year 1	Year 2					
Proportion of inpatient discharges, ED visits, or observation stays with follow-up billable service within seven days	↑	<-1%**	<-1%		•			
Proportion of eligible beneficiaries who received a transitional care management-billable service	↑	<1%	3%		•			
Behavioral health specialist visits in ambulatory settings (per 1,000 beneficiaries per year)	↑	<1%	3%			•		

Source: Analysis of Medicare claims data from January 2019 to December 2022.

Notes: Bullets in boxes indicate hypothesized associations between primary care activities and leading indicators under PCF. Green shading indicates estimated effect was in hypothesized direction. Red shading indicates estimated effect was not in hypothesized direction. Year 1 estimates are based on practices in Cohorts 1 and 2, and Year 2 estimates are based on Cohort 1 practices only. Estimated impacts are based on a difference-in-differences model with a matched comparison group (see Appendix A.2.5 for methodological details). Arrows indicate the hypothesized direction of impact.

* Significantly different from zero at the .10 level, two-tailed test.

** Significantly different from zero at the .05 level, two-tailed test.

*** Significantly different from zero at the .01 level, two-tailed test.

6. Preliminary impact estimates of the PCF Model on outcomes



Key findings

- PCF did not meaningfully change acute hospitalization rates and, counter to model goals, increased total Medicare Part A and B expenditures per beneficiary per month (including model payments) by around 1.5 percent.
 - Also contrary to model goals, rates of primary-care-substitutable emergency department visits increased faster among PCF practices than among comparison practices, but we have no qualitative evidence that PCF practices made changes that led to the observed increase.
 - Results suggest that PCF slightly increased potentially preventable emergency department visits (counter to model goals) and slightly decreased the proportion of inpatient discharges with unplanned 30-day readmissions (in line with model goals) relative to the comparison group.
 - Estimates suggest early impacts on Medicare Part A and B expenditures and acute hospitalizations differed across Comprehensive Primary Care Plus (CPC+) and non-CPC+ participants, although the magnitude of these differences is likely small. We also find evidence that impacts for primary-care-substitutable emergency department visits varied across practice subgroup categories.
-

A. Focus of this chapter

In this chapter, we report *preliminary* impact estimates of PCF based on data through the end of 2022. Estimates for Performance Year 1 reflect model effects in the first year of a practice's model participation: 2021 for Cohort 1 and 2022 for Cohort 2. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only. We first present effects on the model's two primary outcomes: acute hospitalizations and Medicare Part A and B expenditures. We interpret our results as preliminary both because (1) we are updating our comparison group for future annual reports²³ and (2) we did not necessarily expect to find improvements for these outcomes early in the model. CMS hypothesized that PCF could result in detectable cost savings to Medicare by Performance Year 4. Moreover, earlier evaluations of similar models, such as CPC+, suggest primary care practice transformation is a complex process and might take time to improve outcomes (O'Malley et al. 2023). Findings described in Chapter 5 further support our expectations for the timing of primary outcomes. For instance, PCF practices reported making many care delivery changes, but these changes were often modifications to existing activities that began *before* PCF. The types of changes practices made are reflected in the small impacts we find on leading indicators (that is, measures we expect to see improve if the model is to lower acute hospitalizations and Medicare Part A and B total expenditures).

Although we did not expect to find improvements for the primary outcomes, we also analyzed three secondary outcomes for which we expected larger impacts in the early years of the model. Similar to the leading indicators, results from analyses of secondary outcomes can provide early evidence about the

²³ Starting in the third annual report, we will use a finalized comparison group for the impact evaluation that will incorporate updated information about practices' pre-intervention experience to help bolster support for the parallel trends assumption underpinning the difference-in-difference regression models and to help interpret the impact estimates as effects of PCF.

6. Preliminary impact estimates of the PCF Model on outcomes

impact of practices' changes that might eventually lead to changes in our primary outcomes of interest. A description of our full set of outcomes, including how each aligns with causal pathways described in Chapters 4 and 5, appears in Exhibit 6.1. Lastly, we analyzed our full set of outcomes across three practice subgroups. Exhibit 6.2 lists the subgroups together with a description of our rationale for including each. The set of secondary outcomes and subgroups will be expanded in future reports.

Exhibit 6.1. We estimated impacts of PCF on two primary and three secondary outcomes

Measure	Rationale for inclusion	Causal pathway
Primary outcomes		
Acute hospitalizations	These assess whether the model is on track to achieve its goal of reduced acute hospitalizations.	All
Medicare (Part A and B) expenditures	These assess the cost neutrality of the model.	All
Secondary outcomes		
Primary-care-substitutable ED visits	If beneficiaries have greater access to care or better care management, then we might expect to see reductions in this outcome because it captures visits that could have been completed in a primary care setting. Defined as the subset of outpatient ED visits not leading to an inpatient admission that are classified as nonemergent or emergent but treatable in a primary care setting.	All
Potentially preventable ED visits	Through longitudinal care management, we might see reductions in potentially preventable ED visits if appropriate ambulatory care has been provided. Defined as outpatient ED visits that could have been avoided through access to high-quality primary care.	LCM
Proportion of inpatient discharges with unplanned 30-day readmission	Through episodic care management, we might expect to see reductions in unplanned readmissions within 30 days of an inpatient discharge based on reported practice activities through Performance Year 2.	ECM

Notes: We describe the process for constructing all outcome measures in more detail in Appendix A.2.4.

ECM = episodic care management; ED = emergency department; LCM = longitudinal care management; PCF = Primary Care First.

Exhibit 6.2. We estimated impacts of PCF across three practice subgroups

Subgroup definitions	Rationale for inclusion
Whether practice participated in CPC+ before PCF	Many PCF practices participated in CPC+ and had substantial prior transformation experience that they might have brought to PCF. These practices might have greater readiness to make changes that could improve outcomes early in the model, but they also might have less room for improvement, potentially resulting in smaller impacts.
Whether practice participated in the Medicare Shared Savings Program at the start of PCF	Participants in the Medicare Shared Savings Program bring experience in value-based care, potentially resulting in smaller but more immediate impacts of PCF on outcomes. Participation in the Medicare Shared Savings Program is generally stable from one year to the next.
Whether practice was affiliated with a hospital-based health system at the start of PCF	PCF participation is often implemented at the system level for many practices (see Chapter 5, section B), which can help promote change activities through access to additional resources but reduce local practice control over care changes, potentially resulting in more immediate and differential impacts compared with non-affiliated practices.

CPC+ = Comprehensive Primary Care Plus; PCF = Primary Care First.

We estimate model effects using difference-in-differences regression and a newly developed hybrid frequentist-Bayesian technique. The difference-in-differences method (a frequentist statistical approach) estimates impacts based on the difference in outcomes between practices that started PCF regardless of whether they later left the model and a set of matched comparison practices we selected, adjusting for any difference in outcomes that existed between the PCF and comparison practices before the model. We selected comparison practices from other

primary care practices in PCF regions that were not participating in PCF. (See Appendix A.2.5 for comparison selection methods and details of the matched comparison group). The hybrid frequentist-Bayesian technique uses the same comparison group as the main difference-in-differences method but enables us to estimate the *probability* that PCF increased or reduced a given outcome—something that is not possible based on *p*-values from frequentist analyses.²⁴ Details on data sources, sample construction processes, and estimation methods appear in Appendices A.2.6 and A.2.7.

Strengths of Bayesian methods

Bayesian methods offer a number of methodological strengths, including (1) incorporating prior evidence from related literature to place early findings from PCF into the context of the results of previous similar evaluations, (2) capitalizing on patterns in the data (such as relationships between subgroups and performance years) to increase the precision of the estimates and help minimize the probability of extreme estimates (which could occur due to chance), and (3) enabling probabilistic conclusions about whether the model resulted in impacts, such as, “There is a 2 percent probability that PCF reduced acute hospitalizations, relative to the comparison group, by at least 1 percent in Performance Year 1.”

²⁴ Specifically, a *p*-value describes the likelihood of obtaining a result for a given outcome equal to or more extreme than the estimate we observe, assuming the true result is zero. This is generally not the same as the likelihood the result is real (that is, not due to chance).

Summary of methodology used to estimate impacts of PCF on Medicare FFS beneficiaries

Outcomes and data sources. Primary and secondary outcome measures were constructed using Medicare FFS claims data from January 2019 to December 2022. We provide detailed outcome definitions and describe the process for constructing all outcome measures in more detail in Appendix A.2.4.

Beneficiary control variables, including demographics (proportion of beneficiaries in age, race/ethnicity, and gender categories), original reason for Medicare entitlement, dual eligibility status, and HCC scores, came from the following data measured from 2019 to 2022: Medicare enrollment database, CMS Master Beneficiary Summary File, and RAND Medicare Bayesian Improved Surname Geocoding data.

Practice-level control variables, such as health system affiliation and participation in the Medicare Shared Savings Program, came from several sources, including 2019 to 2021 OneKey data, the 2020 to 2021 Area Health Resource File, the CMS Master Data Management database, the Centers for Disease Control and Prevention, and the National Institute of Environmental Health Sciences. More details on covariates and data sources appear in Appendix A.2.6.

Analytic population. We used Medicare FFS claims and enrollment data to attribute Medicare FFS beneficiaries to PCF and comparison practices that provided primary care in the PCF regions. After a beneficiary was attributed to a specific PCF or comparison practice during the model period, they remained assigned to that practice throughout the evaluation, even if the PCF practice later left the model or the beneficiary was later attributed to a different practice. Because attribution can change quarterly but assignment occurs just once, assigned beneficiaries per practice outnumber those attributed.

We use assignment as part of our ITT design, which tracks outcomes over the five years of the model even if a practice withdraws or a beneficiary stops visiting a practice. This design helps stabilize our analytic sample size and guards against bias that could occur if attrition from the model is correlated with outcomes. For example, because the model rewards strong performance on acute hospitalizations and penalizes poor performance, we expect practices with systematically poor performance to receive downward payment adjustments and thus be more likely to leave the model. Details on how the analytic population is constructed are available in Appendix A.2.1.

Analytic methods. We produced impact estimates of PCF on claims-based measures over both cohorts using difference-in-differences regression models (a frequentist statistical approach). For this technique, we compared the regression-adjusted mean change in outcomes for Medicare FFS beneficiaries from the two years before PCF (for Cohort 1, 2019-2020; for Cohort 2, 2020-2021) with the Performance Years for two groups: (1) beneficiaries assigned to PCF practices and (2) beneficiaries assigned to comparison practices. Details are available in Appendix A.2.6.

We also used a newly developed hybrid frequentist-Bayesian model that enables statements about the probability that PCF increased or reduced a given outcome (Lipman et al., 2022). Additional details appear in Appendix A.2.7.

B. Early effects of PCF on primary outcomes

Over the first two years, PCF did not meaningfully change acute hospitalizations and increased total Medicare Part A and B expenditures (including model payments) by around 1.5 percent (Exhibit 6.3). The estimates for Medicare Part A and B expenditures amount to an increase of \$17 and \$16 per beneficiary per month (PBPM) in Performance Years 1 and 2,²⁵ respectively. Both estimates are statistically significant at the 1 percent level. Hybrid frequentist-Bayesian results indicate that there is less than a 1 percent probability Medicare Part A and B expenditures decreased relative to the comparison group, corresponding to a greater than 99 percent probability of an increase.

The increase in Medicare Part A and B expenditures is consistent with PCF payments being more generous than regular FFS and is robust to various sensitivity analyses. Our estimates for total Medicare Part A and B expenditures align with the payment calibration calculations we discuss in Chapter 3, indicating that although PCF practices often reported model payments as being too low, these practices received higher payments under the model than what they would have received under FFS without shifting from billable services. The findings are also robust to tests we report in Appendix B.13 that assess the sensitivity of our main result for Medicare Part A and B expenditures to the influence of outliers and alternative levels of clustering.

Results for the primary outcomes are largely consistent with our hypotheses for the early impacts of PCF. We did not expect to detect improvements in the primary outcomes after only two performance years; for this reason, it is too early to draw conclusions about whether PCF will ultimately improve primary outcomes. Future annual reports will continue to track effects on acute hospitalizations and Medicare Part A and B expenditures.

Exhibit 6.3. PCF did not change acute hospitalizations and increased Medicare Part A and B expenditures over the first two performance years

Performance Year	Number of practices	PCF group mean	Impact estimate (SE)	Percentage impact	p-value	Probability the outcome decreased for PCF practices, relative to comparisons, by at least 1%
Acute hospitalizations (per 1,000 beneficiaries per year)						
Year 1	PCF = 2,809 Comparison = 6,741	237	<1 (1)	<0.1%	0.99	2%
Year 2 ^b	PCF = 757 Comparison = 2,071	254	2 (2)	0.7%	0.36	<1%
Medicare Part A and B expenditures (\$ PBPM)^a						
Year 1	PCF = 2,809 Comparison = 6,741	\$1,035	\$17 (\$3)	1.6%	<0.01	<1%
Year 2 ^b	PCF = 757 Comparison = 2,071	\$1,132	\$16 (\$6)	1.4%	0.01	<1%

²⁵ Impact estimates for Performance Year 1 incorporate data from both cohorts, while estimates for Performance Year 2 rely on data from Cohort 1 only.

6. Preliminary impact estimates of the PCF Model on outcomes

Source: Mathematica's analysis of Medicare claims data from January 2019 to December 2022.

Notes: The probabilities of decreases in outcomes reflect model impacts (that is, decreases relative to the comparison group) and come from the hybrid frequentist-Bayesian analysis described in more detail in Appendix A.2.7. The number of PCF practices differs from the number of practices shown in Chapter 2 because the impact analysis dropped practices that (1) were glide-path practices, defined as practices that provisionally joined PCF during the first intervention year but were not eligible for PCF at the time of model launch and had to meet a minimum beneficiary count by the end of the first year to continue participation, and (2) we weren't able to match to a comparison practice.

^a Medicare Part A and B expenditures include population-based payments and performance-based adjustments for PCF practices, MIPS adjustments, advanced APM bonuses, and (for the pre-intervention period only) CPC+ Track 2 capitated payments and comprehensiveness bump.

^b Estimates for Performance Year 2 reflect 2022 experience for Cohort 1 practices only.

APM = alternative payment model; CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MIPS = Merit-based Incentive Payment System; PBPM = per beneficiary per month; PCF = Primary Care First; SE = standard error.

C. Early effects of PCF on secondary outcomes

Beneficiaries at PCF practices had 2.8 percent more primary-care-substitutable emergency department (ED) visits in Performance Year 2 than did the comparison group (Exhibit 6.4 and Exhibit 6.5). The direction of the impact estimate for primary-care-substitutable ED visits is opposite to our hypothesis if the model were successful and amounts to a statistically significant increase of 4 visits per 1,000 beneficiaries per year. Hybrid frequentist-Bayesian results are consistent with this result, indicating a <1 percent probability of a decrease of 1% or more in primary-care-substitutable ED visits in Performance Year 2.

Although the frequentist and hybrid frequentist-Bayesian estimates suggest the model has led to early increases in primary-care-substitutable ED visits, there are several reasons to interpret this result with caution. First, although PCF practices reported making efforts to engage more with patients, we did not uncover qualitative evidence that indicates activities made by PCF practices should lead to more primary-care-substitutable ED visits relative to comparison practices. On the contrary, care managers reported advising patients to avoid going to the ED (unless it was necessary) without first contacting the practices. Second, we estimated the largest increase in primary-care-substitutable ED visits for PCF practices, relative to comparisons, in Performance Year 2, when we have data for Cohort 1 only. Cohort 1 accounts for about one-quarter of the analytic sample, so these results might not reflect effects for PCF as a whole.

Early results suggest that PCF might have slightly increased potentially preventable ED visits and slightly decreased the proportion of inpatient discharges with unplanned 30-day readmissions, relative to the comparison group. The difference-in-differences impact estimates for potentially preventable ED visits, although not statistically significant, point to increases, consistent with high hybrid frequentist-Bayesian probabilities of increases. Similarly, the frequentist impact estimates for the proportion of inpatient discharges with unplanned 30-day readmissions point to small, not statistically significant decreases in this outcome, corresponding to modest hybrid frequentist-Bayesian probabilities—39 and 35 percent in Performance Years 1 and 2, respectively—of reductions of 1 percent or more. We will continue to assess these outcomes in future reports to determine whether these suggestive estimates persist.

6. Preliminary impact estimates of the PCF Model on outcomes

Exhibit 6.4. We find limited evidence that PCF led to changes in secondary outcomes for Medicare FFS beneficiaries over the first two performance years

Performance Year	Number of practices	PCF group mean	Impact estimate (SE)	Percentage impact	p-value	Probability the outcome decreased for PCF practices, relative to comparisons, by at least 1%
Primary-care-substitutable ED visits (per 1,000 beneficiaries per year)						
Year 1	PCF = 2,809 Comparison = 6,741	129	1 (<1)	0.9%	0.19	<1%
Year 2 ^b	PCF = 757 Comparison = 2,071	141	4 (2)	2.8%	0.04	<1%
Potentially preventable ED visits (per 1,000 beneficiaries per year)						
Year 1	PCF = 2,809 Comparison = 6,741	36	<1 (<1)	1.6%	0.18	1%
Year 2 ^b	PCF = 757 Comparison = 2,071	39	<1 (<1)	2.1%	0.37	3%
Proportion of inpatient discharges with unplanned 30-day readmission^a						
Year 1	PCF = 2,795 Comparison = 6,707	0.14	<-0.001 ^c (0.001)	-0.2%	0.78	39%
Year 2 ^b	PCF = 757 Comparison = 2,057	0.15	-0.002 (0.002)	-1.1%	0.47	35%

Source: Mathematica's analysis of Medicare claims data from January 2019 to December 2022.

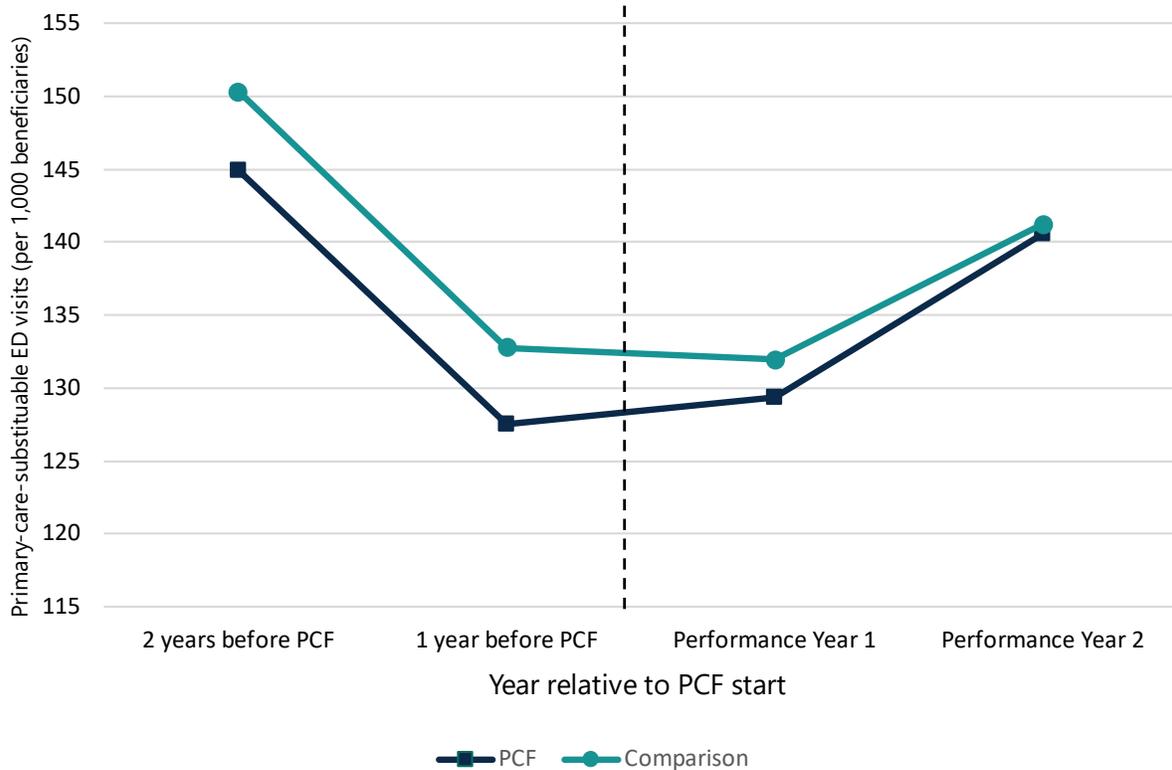
^a We constructed our analytic sample for proportion of inpatient discharges with an unplanned 30-day readmission from discharge-level observations. The regression models for this outcome included additional control variables, described in Appendix A.2.6, compared with models run on outcomes constructed from beneficiary-level observations.

^b Estimates for Performance Year 2 reflect 2022 experience for Cohort 1 practices only.

^c The impact estimate is between 0 and -0.001.

ED = emergency department; FFS = fee for service; PCF = Primary Care First; SE = standard error.

Exhibit 6.5. PCF and comparison practices had similar pre-intervention trends for primary-care-substitutable ED visits, but visits increased faster during the model for PCF practices



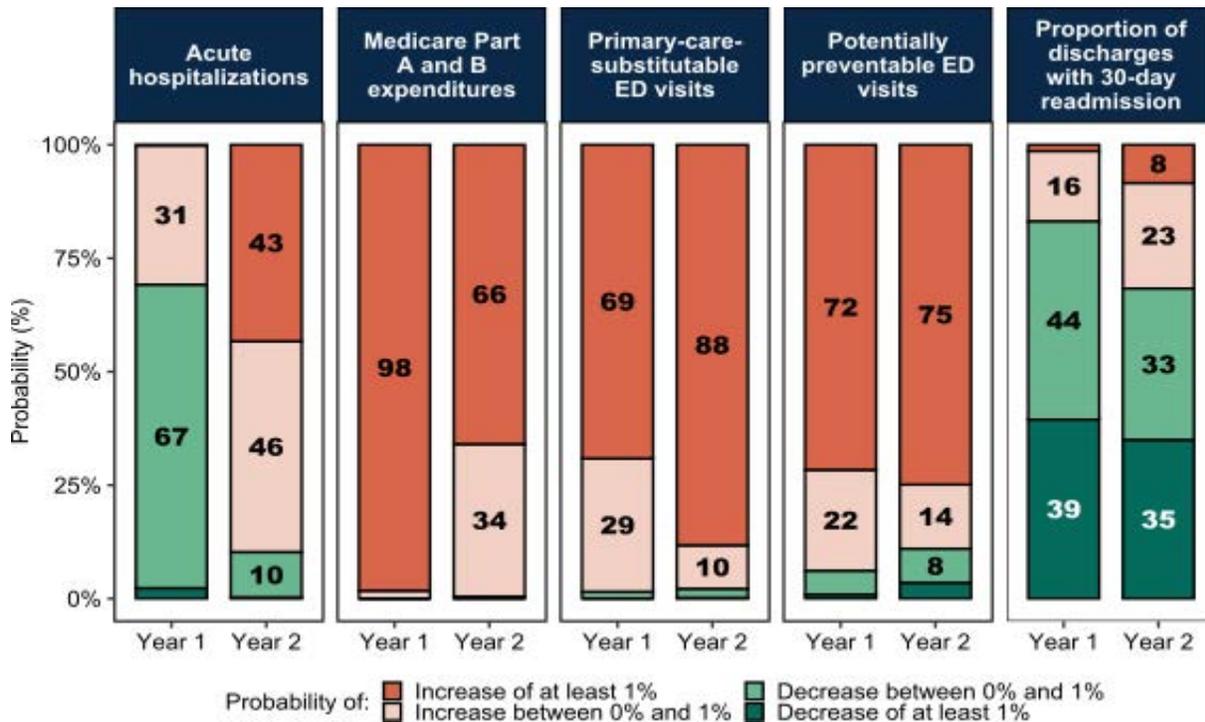
Source: Mathematica’s analysis of Medicare claims data from January 2019 to December 2022.

Notes: The dashed vertical line denotes the start of PCF. The figure uses data for PCF and comparison practices in Cohort 1 and Cohort 2 except for Performance Year 2, which uses data only for Cohort 1 PCF and comparison practices.

ED = emergency department; PCF = Primary Care First.

The hybrid frequentist-Bayesian results suggest PCF most likely led to meaningfully large increases in total Medicare Part A and B expenditures, primary-care-substitutable ED visits, and potentially preventable ED visits. By contrast, PCF most likely led to small decreases in acute hospitalizations and the proportion of inpatient discharges with unplanned 30-day readmissions in Performance Year 1. Exhibit 6.6 summarizes these results. For each primary and secondary outcome, we show the probabilities that impacts are meaningfully large (> 1 percent) increases, small increases (0 to 1 percent), small decreases (0 to -1 percent), or meaningfully large (< -1 percent) decreases. We use 1 percent as a rough threshold for meaningful impacts; if there is high probability of impacts between -1 percent and 1 percent, we might conclude that outcomes for PCF practices are substantively similar to outcomes in the comparison group.

Exhibit 6.6. There is a high probability of meaningful increases in total Medicare Part A and B expenditures, primary-care-substitutable ED visits, and potentially preventable ED visits



Note: For readability, very small bar segments are not labeled. Including unlabeled segments, the total probability in each bar sums to 100 percent.

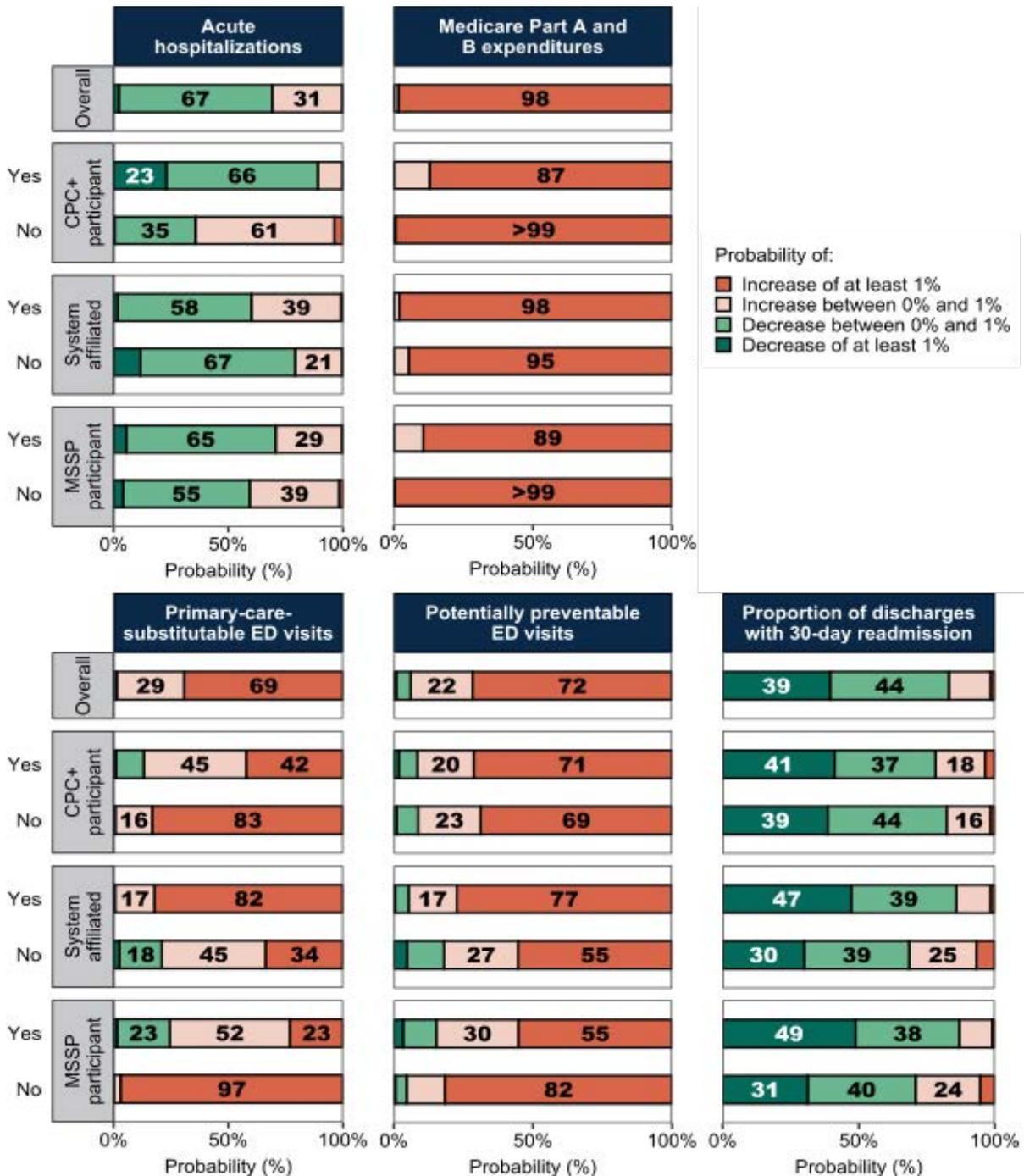
ED = emergency department.

D. Differences in early effects by subgroups

We find evidence of small differential effects across CPC+ and non-CPC+ participants for the primary outcomes. There is some evidence that CPC+ participants might have reduced acute hospitalizations more in Performance Year 1, relative to the comparison group, than non-CPC+ participants. We estimated that acute hospitalizations decreased by one hospitalization per 1,000 beneficiaries among CPC+ participants and increased by one hospitalization per 1,000 beneficiaries among non-CPC+ participants, corresponding to 23 percent and <1 percent probabilities of reductions of 1 percent or more relative to the comparison group. Given the similarity in the impact estimates across the subgroups, it is unsurprising that there is only a 32 percent probability that impact estimates for CPC+ participants and non-participants differ by at least 1 percent of the baseline mean in the PCF group. As Exhibit 6.7 shows, impacts for CPC+ participants and non-participants are most likely to be within +/-1 percent. So, although there is some evidence of differences, these differences are most likely to be small.

6. Preliminary impact estimates of the PCF Model on outcomes

Exhibit 6.7. Hybrid frequentist-Bayesian results suggest little variation in impacts across practice subgroups in Performance Year 1



Source: Mathematica’s analysis of Medicare claims data from January 2019 to December 2022.

Notes: This exhibit shows the probability of impacts at different thresholds for the primary and secondary outcomes overall and by subgroup in Performance Year 1. Within decreases and increases relative to the comparison group, a threshold of 1 percent is used to show the likelihood of different magnitudes of effects. The y-axis indicates the population that the probabilities belong to overall and by subgroup.

For readability, small bar segments are not labeled. Including unlabeled segments, the total probability in each bar sums to 100 percent.

ED = emergency department; CPC+ = Comprehensive Primary Care Plus; MSSP = Medicare Shared Savings Program.

6. Preliminary impact estimates of the PCF Model on outcomes

Similarly, estimated effects on Medicare Part A and B expenditures for CPC+ participants in Performance Year 1 were about half as large (\$11 PBPM) as they were for non-CPC+ participants (\$23 PBPM).²⁶ This difference is statistically significant at the 5 percent level. There is only a 4 percent probability, however, that impacts differed by more than 1 percent, indicating that differences, although precisely measured, might not be large. Full subgroup results for the primary outcomes appear in Appendix B.14 (Exhibits B.14.2, B.14.3, B.14.16, and B.14.17).

Turning to the secondary outcomes, we find statistically significant increases in primary-care-substitutable ED visits for PCF practices that (1) did not participate in CPC+, (2) are affiliated with a hospital-based health care system, or (3) are not Medicare Shared Savings Program ACO participants. Hybrid frequentist-Bayesian results support these findings; for each subgroup, we estimated a moderate to high probability (between 40 percent and 85 percent) that differences in impacts between categories exceed 1 percent. We don't find evidence that the proportion of inpatient discharges with unplanned 30-day readmissions differed by subgroups. Full subgroup results for the secondary outcomes are available in Exhibits B.14.4 to B.14.6 and B.14.18 to B.14.20 in Appendix B.14.

It's possible the subgroup impact estimates do not reflect true causal effects of the model. For example, although smaller expenditures for CPC+ participants align with our hypothesis in Exhibit 6.2, we observe that PCF versus comparison outcome trends in the baseline period were not always similar in the CPC+ participant and non-participant practice subgroups, an important factor that calls into question whether it is appropriate to interpret findings as causal.²⁷ (The key difference-in-differences assumption requires that outcome trends between PCF and comparison practices would have remained parallel if not for the intervention). The same is true for our ED-related subgroup findings. We will continue to examine the subgroup findings using our finalized comparison group over the course of the evaluation.

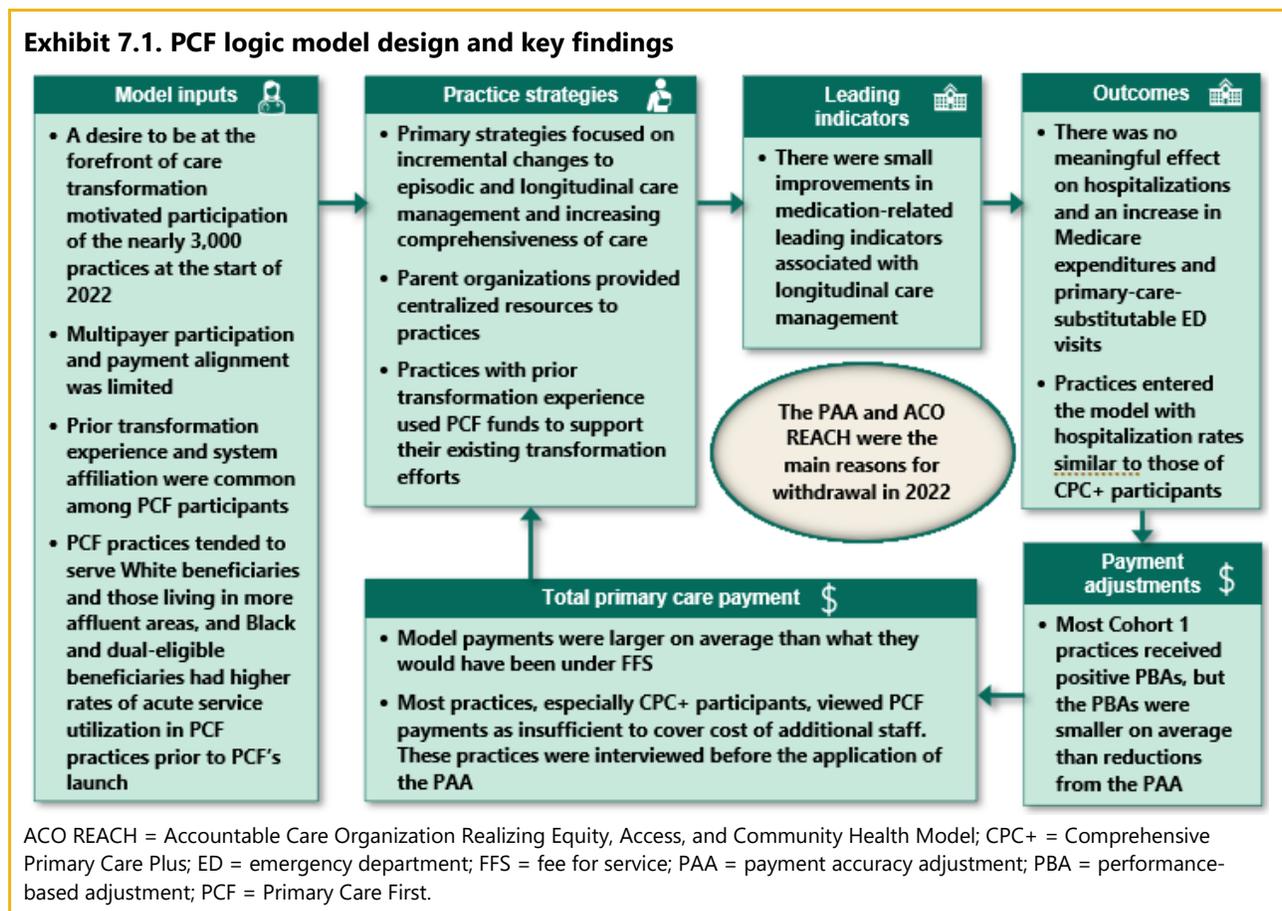
²⁶ We estimated effects on FFS spending, with adjustments, plus PCF Model payments (see Appendix A.2.4 for outcome definitions). This means that when calculating Medicare Part A and B expenditures for CPC+ participants before they joined PCF, we did not include CPC+ enhanced payments such as care management fees and performance-based incentive payments. For practices in CPC+ Track 2 that earned capitated payments under CPC+, we calculated FFS Medicare Part A and B expenditures before PCF began based on the allowed amount on Medicare claims.

²⁷ We present baseline and Performance Year means for PCF and comparison practices in Appendix B.14.3.

7. Conclusion

A. Focus of this chapter

This chapter summarizes the evaluation’s findings from the first two years of PCF. We synthesize our findings across data sources to understand practice and payer participation, the use and views of model payments and supports, the changes practices reported making, preliminary impact estimates on expenditure and service use outcomes, and the effects of payment adjustments on total primary care payments to participating PCF practices. We present preliminary impact estimates because (1) we are updating our comparison group for future reports and (2) we did not anticipate finding improvements for these outcomes early in the model. Using the PCF logic model developed for our evaluation as an organizing framework, Exhibit 7.1 displays the relationship between the model design and key findings from this report. We end with a discussion of our plans for evaluating Year 3 of PCF.



B. Conclusion and implications for PCF and future models

In this report, we analyzed data submitted via the practice portal; interviews with practices, payers, and parent organizations and application data to examine the implementation experience to date; and Medicare claims to estimate preliminary model impact on leading indicators and outcomes. We also examine how the model design, and its implementation to date, could affect future implementation

experience and impacts among the nearly 3,000 PCF participants and the nearly two million Medicare beneficiaries they serve. We have also gained insight into potential lessons from the early years of PCF that might be salient for the design of future primary care transformation models.



Model inputs and practice strategies

Prior transformation experience and the advanced primary care capabilities that practices entered the model with influenced the care delivery changes practices reported making. It is difficult to disentangle the effects of changes practices made under PCF from effects related to activities they started under other models, such as Comprehensive Primary Care Plus (CPC+), and the requirement that practices enter PCF with advanced primary care functioning. Most of the practices we interviewed with prior transformation experience spent 2022 building on changes that they had started under previous value-based payment programs, including CPC Classic and CPC+. Former CPC+ participants might have made care delivery improvements during CPC+ to fulfill that model's care delivery requirements. Thus, the former CPC+ participants would have less need to make those changes now or improve upon those processes in PCF.

The heavy presence of larger health care organizations, such as health systems that include a hospital, both in health care markets and in the PCF Model, reduced clinician exposure to model incentives. The high proportion of practices affiliated with a larger health care organization in PCF also makes it difficult to generalize the evaluation findings to independent practices. The parent organizations of participating practices reported they made enhancements to existing activities rather than engage in new care delivery interventions under PCF, which is behavior in line with what we heard more generally from PCF practices. Practices (and parent organizations) reported a diversity of ways in which the model affected individual practices and clinicians. For example, some practices were subject to upside and downside risk; others had no exposure to upside or downside risk and saw no changes to their payments based on their performance. The parent organizations reported providing centralized supports such as care management staff and tools for data analyses, and the affiliated practices said that they benefitted from these resources. In our interviews, we found few differences between practices affiliated with a system that included a hospital and those affiliated with other group practices but not a hospital. The supports provided by parent organizations and the role that they played in determining the changes practices implemented makes the implementation experiences of independent practices different from those of practices affiliated with a larger health care organization.

Participating practices are more likely to serve White beneficiaries and those living in more affluent areas. Within participating practices, there were disparities in acute service use rates before PCF's launch. PCF practices are also more likely to serve beneficiaries who are not dually eligible for Medicaid and Medicare or for the Part D low-income subsidy. There were disparities in rates of potentially preventable hospitalizations and primary-care-substitutable emergency department (ED) visits among beneficiaries attributed to PCF practices, with the highest rates for beneficiaries who are Black, dually eligible for Medicaid and Medicare, eligible for the Part D low-income subsidy, or residing in a socially vulnerable area. The existence of these disparities prior to PCF's launch presents an opportunity for the model to fulfill CMS' vision for improved health equity.

Lack of meaningful multi-payer participation and alignment—often because of regulatory barriers and limited practice participation—continues to be a challenge. Compared to previous CMMI models, PCF has lower levels of multi-payer participation. Practices reported that when payer partnership existed, payment alignment with PCF was relatively rare, and even less common was full alignment with PCF through capitated payments and both upside and downside risk.



Leading indicators and outcomes

Practices generally performed well on the Quality Gateway measures but had concerns with their ability to influence the Patient Experience of Care Survey (PECS) measure and with the benchmark. Practices said they had little control over patients completing the survey, which could lead to small sample sizes that practices thought might not produce ratings that reflect true practice performance. They also saw the quality gateway as having too high of a performance bar for the PECS measure. The benchmark was set to the 30th percentile among participating practices in the performance year and, by definition, approximately 30 percent of practices would fail and not be eligible for a performance-based adjustment (PBA). To address the latter concern, CMS is moving to use a static PECS performance benchmark of 77 percent, or one based on the 30th percentile of three years of PCF practice performance (whichever is more beneficial to a practice), to provide every practice the opportunity to meet the threshold.

The incremental changes PCF practices reported making in their care processes and their relatively low baseline acute hospitalization rates and expenditures might be factors influencing the lack of favorable effects on primary outcomes and could limit the amount of expected future improvement. We did not find a meaningful effect of PCF on reducing acute hospitalizations after two years for Cohort 1 practices and one year for Cohort 2 practices. Total Medicare expenditures, including model payments, increased by an estimated 1.5 percent. In 2020, Cohort 1 practices, which did not include CPC+ participants, had similar expenditures and rates of acute hospitalizations before PCF's launch as CPC+ participants, and this was after multiple years of model participation for CPC+ practices (Exhibit 7.2). There is a similar pattern for Cohort 2's non-CPC+ participants. This suggests that non-CPC+ PCF practices were starting at levels of performance similar to those of CPC+ participants after years of practice transformation and success at reducing acute hospitalizations (O'Malley et al. 2023). The advanced primary care capabilities required of practices to join PCF, the incremental changes practices reported making to date, and the relatively low baseline expenditure and hospitalization rates of all PCF practices that were congruent with those of CPC+ participants make it likely that the magnitude of changes in these outcomes will be small and take time to emerge. In fact, CMS anticipated PCF could result in detectable cost savings to Medicare by Performance Year 4. The evaluation is powered to detect small impacts, in part because of the large number of practices participating in the model. Because of the factors affecting the potential magnitude of improvement, and because this report has shown that model payments are greater than what they would have been under Medicare fee-for-service (FFS), there is a concern that the model payments might exceed any reductions in total expenditures generated by the model.

Exhibit 7.2. In 2020, before PCF’s launch, Cohort 1 PCF practices had similar levels of spending and acute hospitalizations as CPC+ participants

	PCF Cohort 1	CPC+ (Track 1)	CPC+ (Track 2)
Acute hospitalizations (annualized per 1,000 beneficiaries)	240	243	245
Total Medicare expenditures (\$ per beneficiary per month)	\$919	\$944	\$940

Source: Mathematica’s analysis of Medicare FFS claims and enrollment data in 2020.and CPC+ Fourth Annual Report Supplementary Appendices.

CPC+ = Comprehensive Primary Care Plus; PCF = Primary Care First; FFS = fee-for-service.

There were few meaningful effects on secondary outcomes and leading indicators, which are the types of measures that might be more sensitive in the short term to changes that practices report making. Because of the factors that might affect the timing and magnitude of PCF’s effects on hospitalizations and expenditures, we examined leading indicators that might presage movement in primary outcomes. We also estimated impacts on secondary outcomes that might be more sensitive to changes that practices report making. We observed a small positive impact on two medication-related leading indicators (use of high-risk medications in the elderly and adherence to multiple medications for chronic conditions) that align with the longitudinal care management pathway. We observed an increase of 2.8 percent in primary-care-substitutable ED visits, in the second performance year, which only includes Cohort 1 practices. We do not have evidence from our practice interviews that practices were making changes that would lead to these increases.

The higher rates of primary-care-substitutable ED visits observed among practices affiliated with a larger health care organization or without prior transformation experience reinforced the influence of these factors in the PCF Model. Impact estimates were unfavorable and statistically significant for affiliated practices and those without CPC+ or Medicare Shared Savings Program participation experience, but they were not significant for these subgroups’ counterparts. These findings align with evidence that systems with a hospital have higher rates of service use, including nonemergent ED use, ED use for conditions treatable in primary care, and ambulatory care-sensitive admissions compared with physician-owned practices (Machta et al. 2019). Practices reported the benefits of prior transformation experience putting them ahead of those without similar experience. The practices without the benefits of these experiences and the incremental changes that most practices reported making suggest that it might take longer to achieve reductions in hospitalizations and ED visits among these practices. CMS designed PCF as a practice-level model, and these findings, along with the implementation experience, highlight the influential roles that affiliation with a larger health care organization and prior transformation experience have had and will continue to have in the future. The findings are also instructive when designing future practice-level models. For example, the Making Care Primary model has a 10-year performance period, and CMS is providing additional supports to practices without prior transformation experience to help them achieve model goals.

Payment adjustments and total primary care payment

Practices saw the Payment Accuracy Adjustment (PAA) as a penalty instead of a Medicare recoupment of payment for primary care services covered under the PBP that were furnished outside the attributed practice. The PAA did not take effect until 1.5 years into practices' participation in the model and had a meaningful downward effect on total primary care payments for many practices. The combination of the timing and the magnitude of the adjustment led many practices to regard the PAA as punitive. It is possible that estimating the adjustment and applying it from the start of PCF would improve the perception of PAA because practices would not see it as a loss and instead might see improvements as a bonus. Furthermore, changing the timing of the PAA could provide payment stability because there would not be large fluctuations because of recoupments made in the performance year. It could also provide practices with a preview of the estimated adjustment, giving them an opportunity to make changes to mitigate the PAA's effect. However, despite voicing concerns about the PAA, most practices did not plan to actively mitigate their PAA and believed to a certain degree that visits contributing to the PAA were inevitable.

Practices expressed concern with how services furnished by nurse practitioners contribute to the PAA and that the PAA could penalize practices by counting visits to an urgent care center toward the PAA when the urgent care center visit might have diverted a beneficiary from the ED. Many nurse practitioners provide specialty care and may submit claims with primary care service codes. The combination of certain nurse practitioner specialty codes and codes for selected primary care services may result in the encounter contributing to the PAA. For example, an evaluation and management (E&M) visit with a nurse practitioner with an eligible primary care specialty code in a specialty practice would contribute to the PAA. Reconsidering how nurse practitioner services affect the PAA methodology and the resulting impact on model payment calculations and rates may alleviate concerns among the practices. These concerns currently stem from the perception that the existing adjustment unfairly penalizes practices for referrals to specialists, especially when patients receive treatment from nurse practitioners not engaged in primary care. Practices might also be penalized by the PAA for diverting patients from an ED to an urgent care center if the urgent care services are furnished by a primary care practitioner. In addition to the perceived financial effect on the practices, this also undermined participants' perception of PAA's fairness when, for example, practices are trying to increase patients' access by opening an urgent care center to accommodate care needs for times when the practice is closed.²⁸

Most Cohort 1 practices received a positive PBA, but it was often smaller in magnitude than the PAA reduction. The PBA increased Cohort 1 practices payments by 7 percent, on average, but the PAA decreased practices' PBPs by 35 percent, on average. During the first year of payment adjustment for Cohort 1, one-quarter of the practices received a positive PBA in all four quarters, and more than half of practices had a mixture of positive, negative, and neutral adjustments across quarters. Although PBA performance is not related to the PAA, the net effect for some practices was an unexpected reduction in total primary care payment despite good performance on the Quality Gateway and PBA.

²⁸ CMS has adjusted the PAA over time in response to participant concerns. These have ranged from explicitly removing nurse practitioners with acute care or women's health specialty designations from contributing to the adjustment to clarifying the adjustment's intent by dropping the previously used word leakage in favor of PAA.

On average Cohort 2's model payments were larger than what they would have been under FFS reimbursement across all risk groups, but most practices saw the model payments as insufficient to support their care transformation efforts. Including estimated PAAs, Cohort 2 PCF practice revenues remained, on average, 33 percent greater than what they would have received under FFS. CPC+ participants were more likely than non-participants to report the payments as inadequate in large part because of their experience with care management fees provided under CPC+. This aligns with our findings for Cohort 1 in the first evaluation report (Conwell et al. 2022).

C. Next steps for the PCF evaluation

In 2024 we will reinterview Cohort 1 practices to analyze the trajectory of practice transformation after three years in PCF and deepen our understanding of practices' perceived benefits and drawbacks of the payments they receive from CMS and other payer partners. In interviews, we plan to assess how care delivery changes have evolved over time, whether the changes align with their initial plans, and whether new activities have been implemented. Practices have expressed concern over the adequacy of payments and, in particular, the fairness of the PAA; we will continue to elicit feedback on these topics. We will also take a deeper dive into understanding the degree to which PCF incentives align with other value-based payment programs, including those offered by PCF payer partners.

To complement the interview data, portal data will cover new and expanded topics and examine changes over time in responses to questions that have been in all rounds of portal data.

Behavioral health integration is now a PCF requirement, and we will ask about methods for integrating these services into their practices. Because of the prominent role of affiliation with a larger health care organization and prior transformation experience in PCF, we will ask about care delivery decision making processes in these affiliated practices and the overlap in changes implemented under PCF and other primary care transformation efforts. We will add questions about perceptions of model payment components (for example, the PBA and PAA) to complement the interview data and to analyze changes in how practices view the adequacy of the payments. Finally, to align with current CMMI strategic objectives, we will expand our analysis of health equity to include questions on this topic in the portal for the first time.

We will expand our impact analyses to include another year of data, additional outcomes, and additional sensitivity tests and supporting analyses. New outcomes will include primary care utilization measures, all-cause ED visits, and more granular expenditure measures. We will analyze at least two new subgroups—beneficiaries with behavioral health conditions and medically complex beneficiaries—to understand the effects on beneficiaries who might be more likely to benefit from changes PCF practices are making related to these two sets of clinical conditions. New sensitivity tests will examine, among other things, how robust the estimates are to alternative definitions of the baseline population. We will also conduct analyses to understand the effects of practice attrition from PCF and the relationship between the PBAs and outcomes. Since the start of PCF, 27 percent of Cohort 1 and 10 percent of Cohort 2 practices have withdrawn from the model. Our attrition analyses will examine whether withdrawn practices are systematically different than those that remain in the model and the effect of attrition on the impact estimates. Our PBA analysis will expand our payment calibration work to assess the alignment between practice performance on outcome measures of interest and the PBAs.

References

- Abadie, A., S. Athey, G.W. Imbens, and J.M. Wooldridge. "When Should You Adjust Standard Errors for Clustering?" *The Quarterly Journal of Economics*, vol. 138, no. 1, 2023, pp. 1–35.
- Billings, J., N. Parikh, and T. Mijanovich. "Emergency Department Use in New York City: A Substitute for Primary Care?" The Commonwealth Fund, 2000.
<https://www.commonwealthfund.org/publications/issue-briefs/2000/mar/emergency-department-use-new-york-city-substitute-primary-care>.
- Callaway, Brantly, and Pedro H.C. Sant'Anna. "Difference-in-Differences with Multiple Time Periods." *Journal of Econometrics*, vol. 225, no. 2, 2021, pp. 200–230.
- Centers for Medicare & Medicaid Services. "Primary Care First: Model Briefing." n.d.
<https://www.cms.gov/priorities/innovation/files/slides/pcf-info-webinar-series-slides.pdf>. Accessed October 16, 2023.
- Conwell, Leslie, Rhea Powell, Rachel Machta, Karen Bogen, Boyd Gilman, Linda Barterian, Nancy McCall, et al. "Evaluation of the Primary Care First Model: First Annual Report." *Mathematica*, December 2022. <https://www.cms.gov/priorities/innovation/data-and-reports/2022/pcf-first-eval-rpt>.
- de Chaisemartin, C., and X. D'Haultfoeuille. "Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects." *American Economic Review*, vol. 110, no. 9, 2020, pp. 2964–2996.
- Farley, J.F., A. Kumar, and B.Y. Urick. "Measuring Adherence: A Proof of Concept Study for Multiple Medications for Chronic Conditions in Alternative Payment Models." *Pharmacy*, vol. 7, no. 3, pp. 81.
- Gelman, A., J. Hill, and M. Yajima. "Why We (Usually) Don't Have to Worry About Multiple Comparisons." *Journal of Research on Educational Effectiveness*, vol. 5, no. 2, 2012, pp. 189–211.
- Gelman, A., X.L. Meng, and H. Stern. "Posterior Predictive Assessment of Model Fitness via Realized Discrepancies." *Statistica Sinica*, 1996, pp. 733–760.
- Gelman, A., and D.B. Rubin. "Inference from Iterative Simulation Using Multiple Sequences." *Statistical Science*, vol. 7, no. 4, 1992, pp. 457–472.
- Geyer, C.J. "Practical Markov Chain Monte Carlo." *Statistical Science*, vol. 7, no. 4, 1992, pp. 473–483. <https://doi.org/10.1214/ss/1177011137>.
- Goodman-Bacon, A. "Difference-in-Differences with Variation in Treatment Timing." *Journal of Econometrics*, vol. 225, no. 2, 2021, pp. 254–277.
- Haas, Ann, Marc N. Elliott, Jacob W. Dembosky, John L. Adams, Shondelle M. Wilson-Frederick, Joshua S. Mallett, Sarah Gaillot, Samuel C. Haffer, and Amelia M. Haviland. "Imputation of Race/Ethnicity to Enable Measurement of HEDIS Performance by Race/Ethnicity." *Health Services Research*, vol. 54, no. 1, 2019, pp. 13–23.

- Johnston, K.J., L. Allen, T.A. Melanson, and S.R. Pitts. "A 'Patch' to the NYU Emergency Department Visit Algorithm." *Health Services Research*, vol. 52, no. 4, 2017, pp. 1264–1275.
- Lipman, E.R., J. Deke, and M.M. Finucane. "Bayesian Interpretation of Cluster-Robust Subgroup Impact Estimates: The Best of Both Worlds." *Journal of Policy Analysis and Management*, vol. 41, no. 4, 2022, pp. 1204–1224.
- O'Malley A, Singh P, Fu N, et al. *Evaluation of the Comprehensive Primary Care Plus Initiative: Final Annual Report*. Princeton, NJ: Mathematica; 2023.
- O'Malley, A., P. Singh, N. Fu, N. Duda, N. McCall, K. Geonnotti, D. Petersen, and contributing authors. "Independent Evaluation of Comprehensive Primary Care Plus (CPC+): Final Annual Report." Princeton, NJ: Mathematica, 2023.
- Patton, M.Q. *Qualitative Evaluation and Research Methods*, 3rd ed. Thousand Oaks, CA: Sage, 2002.
- Peikes, D., G. Anglin, A. O'Malley, G. Peterson, S. Dale, N. Duda, R. Brown, et al. "Independent Evaluation of Comprehensive Primary Care Plus (CPC+): Draft Design Report." Mathematica, 2020.
- Perreira, T., L. Perrier, and M. Prokopy. "Hospital Physician Engagement: A Scoping Review." *Medical Care*, vol. 56, no. 12, December 2018.
- Perreira, T., L. Perrier, M. Prokopy, L. Neves-Mera, and D.D. Persaud. "Physician Engagement: A Concept Analysis." *Journal of Healthcare Leadership*, vol. 11, 2019, pp. 101–113.
- QualityNet. "Measure Methodology Reports: Readmissions Measures." 2023. <https://qualitynet.cms.gov/inpatient/measures/readmission/methodology>.
- Rubin, D.B. "Bias Reduction Using Mahalanobis-Metric Matching." *Biometrics*, vol. 36, no. 2, 1980, pp. 293–298.
- Rubin, D.B., and N. Thomas. "Matching Using Estimated Propensity Scores: Relating Theory to Practice." *Biometrics*, vol. 52, no. 1, 1996, pp. 249–264.
- Sekhon, J.S. "Multivariate and Propensity Score Matching Software with Automated Balance Optimization: The Matching Package for R." *Journal of Statistical Software*, vol. 42, no. 7, 2011, pp. 1–52.
- Shea, C.M. "A Conceptual Model to Guide Research on the Activities and Effects of Innovation Champions." *Implementation Research and Practice*, vol. 2, 2021. <https://doi.org/10.1177/2633489521990443>.
- Stan Development Team. *Stan Modeling Language Users Guide and Reference Manual*, 2.33. 2023. <https://mc-stan.org>.
- Sun, L., and S. Abraham. "Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects." *Journal of Econometrics*, vol. 225, no. 2, 2021, pp. 175–199.

- Timmins, Lori, Deborah Peikes, and Nancy McCall. "Pathways to reduced emergency department and urgent care center use: Lessons from the comprehensive primary care initiative." *Health Services Research* 55 (6): 1003-1012; 2020.
- Zeldow, B., and L.A. Hatfield. "Confounding and Regression Adjustment in Difference-in-Differences Studies." *Health Services Research*, vol. 56, no. 5, 2021, pp. 932–941.
- Zellner, A. and D.S. Huang. "Further Properties of Efficient Estimators for Seemingly Unrelated Regression Equations." *International Economic Review*, vol. 3, no. 3, 1962, pp. 300–313.

APPENDICES

Appendix A.1. Primary data collection methods and processes

A.1.1. Payer worksheet

We asked all 20 participating payer partners to complete a short worksheet with information about the approach they were developing or adapting to align with the Primary Care First (PCF) model. The worksheet contained pre-populated data from previously collected evaluation data or their applications, as applicable, that reduced the burden on the person completing the worksheet and that might be challenging or time consuming for a respondent to accurately recall during an interview, such as payment approaches and the number of attributed lives. We fielded the worksheet in fall 2022.

A.1.2. Payer interviews

In 2022, we interviewed Cohort 1 and 2 payers to understand why they participated, their payment approaches, their contracting with PCF practices, and the barriers and facilitators related to partnering in PCF. We invited all 20 participating payer partners (11 Cohort 1 payers and 9 Cohort 2 payers) to interview: 16 participated in an interview, three were unresponsive, and one declined.

Two-person teams conducted interviews via WebEx using semi-structured interview guides. When interviewing payers, we typically interviewed the respondent most familiar with payer's value-based program portfolio; these interviews occurred in November and December 2022.

We audio recorded, transcribed, and loaded the data into qualitative data analysis software for coding and analysis. Using inductive and deductive analysis strategies, analysts reviewed the data to identify hypothesized and emerging themes. As necessary, we used these data to clarify the data from the payer worksheets.

A.1.3. Payer exit interviews

We interviewed two payer partners who chose to end their PCF partnerships in 2022. Similar to the payer partner interviews, two-person interview teams conducted the exit interviews via WebEx using semi-structured interview guides. Interview topics included the payer's reasons for participating in PCF, their reasons for ending their PCF partnership, the barriers and facilitators to PCF implementation, and whether payers plan to continue primary care transformation work. We used the same analysis approach for the payer exit interviews as with the general payer interviews.

A.1.4. PCF Practice Portal data

To complement our rich interview findings, we analyzed the PCF Practice Portal data that practices reported to CMS. All participating PCF practices must complete this reporting and submit it to CMS annually, so the portal data allows a mechanism for tracking practices' efforts to implement the comprehensive primary care functions (that is, functions (that is, access and continuity, care management, planned care and population health, comprehensiveness and coordination, and patient and caregiver engagement and education).

A. Content

The PCF Practice Portal reporting content is broadly divided into two main sections:

- Care delivery (CD) questions were developed by the Centers for Medicare & Medicaid Services (CMS) Innovation Center to provide an annual self-assessment of practices’ current levels of care delivery capabilities.
- General model (GM) questions were developed by the Mathematica evaluation team on a broader set of topics such as reasons and goals for participation, planned and actual care delivery changes (as reported in a series of close-ended questions), planned and actual strategies to reduce avoidable hospitalizations or expenditures (as reported in an open-ended question and subsequently coded), confidence and challenges in reducing hospitalizations or costs, the role of practice leads or champions, practice site management, and other topics.

The full text of the of portal questions is available in Appendix B.7.

B. Data collection timing

For this second annual report, we primarily focus on GM portal data collected at the end of practices’ first year of PCF participation, which was collected starting in December 2021 for Cohort 1 and in October 2022 for Cohort 2, as shown in Exhibit A.1.4.1.

Exhibit A.1.4.1. Schedule for annual PCF Practice Portal data collection

Round	Cohort 1	Cohort 2
Baseline	March/April 2021	October/November 2021
PY 1	December 2021/January 2022	October 2022
PY 2	October 2022 (CD items only) ^a	October 2023
PY 3	October 2023	October 2024 ^b
PY 4	October 2024 ^b	October 2025 ^b
PY 5	October 2025 ^b	October 2026 ^b

Note: The green shaded row indicates the primary focus of Annual Report 2 portal data analysis.

^a Cohort 1 practices were inadvertently asked the incorrect set of GM questions in October 2022, so the GM data are not usable for Year 2 for Cohort 1. This issue did not affect the Year 2 CD items, nor did it impact Cohort 2 data.

^b This indicates a planned future round of data collection.

CD = care delivery; GM = general model; PY = performance year.

C. Data analysis inclusion criteria

To be included in our analysis of the PCF Practice Portal data, practices had to meet two criteria: (1) the practice was active in PCF as of the start of the data collection period for the respective cohorts and rounds, and (2) the practice answered at least one question, meaning it did not leave the portal reporting questions completely blank. Although PCF Practice Portal reporting is a mandatory part of participation in PCF, a few practices did not submit any responses in each round of data collection, as shown in Exhibit A.1.4.2.

For PY 1 GM item data, 785 Cohort 1 practices and 2,156 Cohort 2 practices were eligible for inclusion in our analysis with response rates of 97 percent and 99 percent, respectively. The total number of practices across both cohorts was 2,941, with a response rate of 99 percent. In nearly all instances in which an active practice did not answer any PY 1 portal reporting questions, the practice went on to subsequently drop out of PCF.²⁹

Exhibit A.1.4.2. PCF Practice Portal data analysis sample sizes and response rates, by PY and cohort

	Cohort 1	Cohort 2	Total
Baseline	March 2021	October 2021	
Number active as of the start of data collection	828	2,228	3,056
Number active that answered at least one question	GM: 814 CD: 828	GM: 2,198 CD: 2,211	GM: 3,012 CD: 3,039
Unweighted response rate	GM: 98% CD: 100%	GM: 99% CD: 99%	GM: 99% CD: 99%
PY 1	December 2021	October 2022	
Number active as of the start of data collection	807	2,178	2,985
Number active that answered at least one question	GM: 785 CD: 789	GM: 2,156 CD: 2,156	GM: 2,941 CD: 2,945
Unweighted response rate	GM: 97% CD: 98%	GM: 99% CD: 99%	GM: 99% CD: 99%

Note: Unweighted response rate = number answered at least one question / number active as of the start of data collection.
 CD = care delivery; GM = general model; PY = performance year.

D. Methods for quantitative data

We reviewed basic frequencies of all quantitative, closed-ended items in the portal in aggregate and also stratified by several key practice characteristics subgroups: cohort, risk group, CPC+ participation status, system affiliation, practice size, Medicare Shared Savings Program participation status, and national practice Social Vulnerability Index quartile. Exhibit A.1.4.3 provides definitions and data sources for the subgroups. When possible, we used practice characteristics as of the start of PY 1 data collection to align with our contemporaneous focus on the portal data as a snapshot of practices at one point in time; otherwise, we used baseline data.

²⁹ Across both cohorts, 44 practices left the GM section completely blank and were thus dropped from our analysis. In total, 42 of these practices have subsequently dropped out of PCF. There is no meaningful pattern of practice characteristics that describe the remaining two practices.

Exhibit A.1.4.3. Definitions and data sources for PY 1 key practice characteristics subgroup analysis

Practice characteristic	Definition	Source	Date
Cohort	Cohort 1 practices began their PCF participation in 2021; Cohort 2 practices began their PCF participation in 2022	PCF practice roster data	Cohort 1: December 2021 Cohort 2: October 2022
Risk group	PCF risk group (<i>data as of PY 1</i>)		
CPC+ participation status	Whether the practice is a former CPC+ participant (<i>historical/baseline data</i>)		
Practice size	Number of active providers for the practice site. Small = fewer than fewer providers; Medium = three to 10 providers; Large = 11 or more providers (<i>data as of PY 1</i>)		
Medicare Shared Savings Program participation	Whether the practice participated in the Medicare Shared Savings Program in any quarter during the year of data collection (<i>data as of PY 1</i>)		
System affiliation	Type of affiliation with larger system Independent = If practice is marked as independent; Hospital-based system (vertically integrated) = If practice is marked as being part of a system; Part of another type of health care delivery organization = If practice is not marked as independent or part of a system (<i>baseline data</i>)	IQVIA	Cohort 1: 2020 Cohort 2: 2021
SVI quartile	Mean of tract-level SVI based on the residence of assigned beneficiaries for the practice (<i>baseline data</i>)	VRDC	Cohort 1: 2020 Cohort 2: 2020

CPC+ = Comprehensive Primary Care Plus; PCF = Primary Care First; PY = performance year; SVI = Social Vulnerability Index; VRDC = Virtual Research Data Center.

When reviewing differences between subgroups, we focused on differences in which the proportion of practices that reported making that change differed by 10 percentage points or more compared with the other subgroups in a two-way comparison (such as participation versus non-participation in the Medicare Shared Savings Program) or compared with both other subgroups for that characteristic in a three-way comparison (such as small versus medium versus large practice size).

The full set of overall frequencies for both cohorts for closed-ended questions are in the following appendices: CD and GM questions asked at baseline are in Appendix B.10, CD and GM questions asked at the end of PY 1 are in Appendix B.8, and CD questions asked at the end of PY 2 are in Appendix B.11 (for Cohort 1 only).

E. Methods for analyzing open-ended responses

In this section, we describe how we analyzed the open-ended item included in the portal at the end of PY 1 and reported in Chapter 4: “What have been your practice site’s main strategies for reducing hospitalizations or costs during your first year of participation in PCF?”

Coding took place in two steps. First, we coded responses into eight domains, which were comprised of comprehensive primary care functions and other key practice activities (that is, access and continuity, care management, planned care and population health, comprehensiveness and coordination, patient

and caregiver engagement and education, staffing, preventive care, and other. Second, trained staff coded more specific sub-domain codes in each of the domains; for example, sub-domains within care management included episodic care management, longitudinal care management, risk stratification, and remote patient monitoring. Practices could provide multiple strategies in response to the open-ended question; we coded all of them, meaning a single response could be coded for multiple domains and sub-domains.

We coded all non-blank Cohort 1 cases at the domain level ($n = 616$), and then coded a random sample of Cohort 1 cases at the sub-domain level (n for each domain varied from 34 to 84). We coded a random sample of Cohort 2 cases at both the domain and sub-domain level ($n = 312$). To help ensure we selected a large enough sample of cases for our coding effort, we conducted a saturation assessment for each cohort. To do that, we randomly split the selected cases into two to three replicates, i.e., equal sized groups. We then compared the coding results between the different replicates. While there was some small variation in the results between replicates, the key takeaways in terms of which domain or sub-domains were more prevalent than others were the same regardless of replicate.

Unlike other questions in the portal data, this open-ended question was not required, so there were missing responses. 19-21% of each cohort left this question blank, so these practices were excluded from the qualitative analysis. Although non-responding practices did not differ from ones that responded in terms of key practice characteristics, the missing responses do still raise the possibility that non-responders for this question would have answered differently than those that responded.

F. Data interpretation guidance

There are several important caveats about interpreting data from the portal:

- Portal respondents, typically those affiliated with systems that have multiple practices in PCF, sometimes provided identical responses for more than one practice. This is particularly evident in the free text responses, when it was sometimes clear that the answer was copied and pasted repeatedly for different practices.
- We know from interviews that system-level respondents might not be in the same location as the practice sites for which they are answering questions and might have a perspective that differs from what is happening at an individual practice site.
- Some topics, such as longitudinal care management, are reported from three different items (the CD items, the GM close-ended evaluation questions, and the open-ended question), resulting in data that are not directly comparable. We do not attempt to reconcile any inconsistencies.
- The close-ended question format means that practices' answers to these questions do not allow for nuanced answers or provide much information on the intensity or breadth of a given care delivery activity.
- The open-ended responses are likely a good indicator of top-of-mind information (that is, what they thought of without prompting) and likely represent something quite salient.

A.1.5. Methods for identifying and interviewing a sample of practices participating in PCF

A. Introduction

In this appendix, we describe our methods for identifying and collecting data from a sample of practices as part of the second round of virtual site visits. The site visit interviews occurred between October 2022 and March 2023 and represent the second year of participation for Cohort 1 practices and the first year of participation for Cohort 2 practices.

The primary purpose of round-two data collection was to:

1. Describe the extent to which practices made changes in 2022 in three main strategies for reducing acute hospitalizations under PCF, either by expanding existing activities or implementing new ones.
2. Characterize the activities they implemented and the extent to which these activities were likely to move them along the hypothesized causal pathways to their intended outcomes.
3. Identify the internal and external factors that influenced the successful implementation of these functions and their effectiveness in reducing acute hospital utilization and total cost of care.
4. Evaluate practices' experiences with each component of the PCF payment methodology in 2022

Based on findings from round-one data collection and corroborated by our analysis of portal data, we focused our round-two interviews on two of the most frequently used primary care functions among practices in risk groups 1 and 2 to reduce acute hospital utilization: care management and comprehensiveness and coordination. Because of the variation in care management strategies (and the differences in how they are expected to affect outcomes), we sampled practices focused on longitudinal care management (for patients with chronic or complex medical conditions) versus those using episodic care management (for patients experiencing a care transition such as after a hospital discharge) separately. Comprehensiveness and coordination spans multiple strategies, including integrating behavioral health, addressing health-related social needs, and coordinating referral management with medical specialists. Because of the overlap in activities across these strategies and the similarities in how they are likely to affect outcomes, we sampled practices using comprehensiveness and coordination strategies to reduce acute hospital utilization as a group.

Although we sampled on these three strategies, we asked about activities related to the other primary care functions (access and continuity, patient and caregiver engagement, and planned care and population health) as well. Additionally, we interviewed a sample of Cohort 2 practices in risk groups 3 and 4 serving higher-acuity patients with more complex health needs. Finally, from among these practices, we interviewed a subset so that we could describe how practices perceived the benefits and challenges of the PCF payments methodology, including how practices are using PCF payments to support practice transformation.

B. Identifying and stratifying the sample frame

The first step in selecting practices in risk groups 1 and 2 for the round-two data collection sample was to identify the primary care function most central to their efforts to reduce acute hospital utilization. We started by identifying practices that reported on the close-ended questions in the portal related to changes they were implementing (round-2 data for Cohort 1) or planning to implement (round-1 data for Cohort 2) that aligned with longitudinal care management, episodic care management, or comprehensive and coordination (see Exhibit A.1.5.1). We flagged practices that responded to any of these response categories by reporting “Yes, change completed” or “Yes, in process, currently working on the change” (Cohort 1) and “Yes, change likely in the first year” (Cohort 2) as candidates for one (or more) of the three data collection samples.

Exhibit A.1.5.1 Portal questions used to identify practices with planned or implemented changes to longitudinal care management, episodic care management, or comprehensive and coordination

Portal content	Round 2 questions (Cohort 1)	Baseline questions (Cohort 2)
Root question	<p>8. Primary care practices started PCF with different capabilities to implement the model; there is no expectation that every practice will make the same or all these changes. So far in your first year of participation in PCF, have you made any of the following changes at your practice site?</p> <ul style="list-style-type: none"> – YES, change completed – YES, IN PROCESS, currently working on the change – NO, though change may be needed (insufficient resources or other barriers) – NO, because change not needed 	<p>2. In the first year of your participation in PCF, do you expect to make any of the following changes to care delivery at your practice site?</p> <ul style="list-style-type: none"> – YES, change likely in the first year – NO, change not needed in the first year – NO, though change may be needed (insufficient resources or other barriers) – DON'T KNOW/UNSURE
Longitudinal care management	i. Improved or expanded care management processes to help patients manage their medical conditions between visits	g. Expand our care management processes to help more patients manage their medical conditions between visits
Episodic care management	j. Improved or expanded ability to be notified when a patient has a hospital discharge or ED visit	h. Improve or expand ability to be notified when a patient has a hospital discharge or ED visit
	k. Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit	i. Improve or develop new processes to systematically follow up with patients after hospital discharge or ED visit
Comprehensiveness and coordination	c. Added behavioral health staff or in some other way enhanced behavioral health integration at our practice site	c. Add behavioral health staff or in some other way enhance behavioral health integration at our practice site
	m. Improved coordination with specialists	k. Increase coordination with specialists
	n. Improved coordination with other providers (for example, home health agencies, hospice agencies, pharmacists, durable medical equipment suppliers)	n. Increase coordination with other providers (for example, home health agencies, hospice agencies, pharmacists, durable medical equipment suppliers)

Portal content	Round 2 questions (Cohort 1)	Baseline questions (Cohort 2)
	p. Increased screening for patients’ social needs (for example, housing, transportation, food)	l. Increase screening for patients’ social needs (for example, housing, transportation, food)
	q. Improved coordination with community resources to meet patients’ social needs (for example, housing, transportation, food)	m. Improve coordination with community resources to meet patients’ social needs (for example, housing, transportation, food)

ED = emergency department, PCF = Primary Care First, SDOH = social determinants of health.

The next step was to review and code the open-ended responses among this subset of practices and identify those that, based on the presence of one or more key terms, were likely to be using longitudinal care management, episodic care management, or comprehensive and coordination as a main strategy for reducing acute hospitalizations. To check the interrater reliability of our coding efforts, we implemented a quality assurance process in which a second team member reviewed the first reviewer’s primary care function classification and both reviewers discussed unclear responses until agreement was reached.

Our final care delivery sampling frame for practices in risk groups 1 and 2 included a total of 975 practices: 155 practices in Cohort 1 (22 percent of all Cohort 1 practices) and 820 practices in Cohort 2 (37 percent of all Cohort 2 practices). We classified forty percent (62) of the Cohort 1 practices and 36 percent (297) of the Cohort 2 practices as pursuing more than one of the key strategies to reduce acute hospitalizations that would make them eligible for our sample. We excluded from the sampling frame practices that became inactive before October 2022, participated in round-one data collection (either directly as a practice or indirectly as part of a system that participated), or did not complete the General Model portal items. Additionally, fifty-four percent (1,133) of the remaining 2,108 practices could not be mapped to one of the three key strategies that would make them eligible for our sample based on the information in the portal data, either because they lacked sufficient detail to allow us to identify their strategy or appeared to be pursuing a different care delivery intervention. Our final sampling frame represented nearly half (46 percent) of all eligible practices.

Exhibit A.1.5.2 shows how we classified the 975 practices in the total risk group 1 and 2 sampling frame into each of the three primary care functions (as indicated in the practice portal data). Longitudinal care management has the largest number of practices (607) and comprehensive and coordination has the fewest (285). The responses obtained through interviews with these three practice groups might not reflect the experiences of practices we excluded from the analysis or were unable to categorize based on their portal data (because they provided insufficient detail or appeared to focus on a different primary care function). However, a comparison of portal data between practices we mapped into one or more of the groups versus those we could not suggests that we do not appear to be missing any new primary strategies that practices were implementing under PCF.

Exhibit A.1.5.2. Some practices were eligible for inclusion in multiple samples because they were pursuing more than one key strategy to reduce acute hospitalizations

Primary care function	Cohort 1 (N = 155)	Cohort 2 (N = 820)	Total (N = 975)
Longitudinal care management	112	495	607
Episodic care management	99	400	499
Comprehensiveness and coordination	19	266	285

Source: Mathematica's analysis of data from Primary Care First Practice Portal (2021 for Cohort 1 and 2022 for Cohort 2) and PCF participation roster as of October 2022.

Note: Only practices in risk groups 1 and 2 are eligible to participate in this sampling frame. We excluded practices that became inactive before October 2022 and those that participated in round-one data collection (either directly as a practice or indirectly as part of a system that participated). Of the 155 practices in the Cohort 1 sampling frame, we identified 53 as implementing longitudinal care management only, 38 as implementing episodic care management only, and two as implementing comprehensiveness and coordination only. Of the 820 practices in the Cohort 2 sampling frame, we identified 223 practices as implementing longitudinal care management only, 152 as implementing episodic care management only, and 148 as implementing comprehensiveness and coordination only.

C. Selecting practices for round-two data collection

We designed our care delivery sampling strategy (within each primary care function) with two goals in mind: first, to draw a stratified sample that would enable us to compare responses across practices based on a few key factors likely to influence implementation experience and performance; and second, to solicit feedback from a diverse set of practices with potentially different experiences implementing their primary care functions and support activities. We used a multi-step process to draw the final sample of practices for round-two data collection.

1. First, we divided all the risk group 1 and 2 practices in our sampling frame (975) into the three (non-mutually exclusive) groups based on their main strategies. Within each of these groups, we divided practices by cohort and, for Cohort 2, into those that did versus did not participate in CPC+. This resulted in a total of nine (potentially overlapping) groups based on their strategies, cohort, and CPC+ experience. For the complex patients risk group, we selected practices from Cohort 2 only and divided them into those with versus without CPC+ experience. We limited this group to Cohort 2 practices because we sampled nearly all Cohort 1 practices in risk groups 3 and 4 during the first round of data collection and wanted to avoid burdening them with a second round of interviews.
2. Third, we randomly selected 14 practices from each main strategy for risk groups 1 and 2, including six Cohort 1 practices, four Cohort 2 practices with CPC+ experience, and four Cohort 2 practices without CPC+ experience. Of these, we selected system-affiliated practices proportional to their representation among all participating practices in each group. We also randomly selected 8 practices in risk groups 3 and 4. Exhibit A.1.5.3 shows the number of selected practices in each group relative to the number of practices in the sampling frame. After we selected the primary sample members for each of the first three groups, we selected replacements from the same stratum, if necessary, to avoid having practices or systems appear under more than one strategy.

- Finally, we reviewed the selected practices (and made replacements if necessary) to ensure there was representation within each sample group based on system affiliation (that is, whether or not the practice was affiliated with a hospital-based health care system); practice setting (that is, whether the practice was located in a rural, urban, or suburban area); geographic region (based on the 10 HHS regions), and size (divided into three categories based on the number of practitioners working in each practice).

Exhibit A.1.5.3. Number of practices in care delivery sample frame and sample by sample group and strata

Sample group	Cohort	CPC+ experience	Number of practices in sample frame	Number of practices selected for data collection
Longitudinal care management	Cohort 1	n.a.	112	6
	Cohort 2	With CPC+ experience	321	4
		Without CPC+ experience	174	4
Episodic care management	Cohort 1	n.a.	99	6
	Cohort 2	With CPC+ experience	241	4
		Without CPC+ experience	159	4
Comprehensiveness and coordination	Cohort 1	n.a.	19	6
	Cohort 2	With CPC+ experience	173	4
		Without CPC+ experience	93	4
Complex patients	Cohort 1	n.a.	15	0
	Cohort 2	With CPC+ experience	12	4
		Without CPC+ experience	24	4

Source: Mathematica’s analysis of data from Primary Care First Practice Portal (2021 for Cohort 1 and 2022 for Cohort 2) and PCF participation roster as of October 2022.

Notes: Only practices in risk groups 1 and 2 were eligible to participate in the first three groups, and only those assigned to risk groups 3 and 4 were eligible to participate in the fourth group. We excluded practices that became inactive before October 2022 and those that participated in round-one data collection (either directly as a practice or indirectly as part of a system that participated).

CPC+ Comprehensive Primary Care Plus.

Exhibit A.1.5.4 shows the characteristics of the 50 practices in risk groups 1 and 2 selected to be interviewed. The practices selected for round-two interviews are generally representative of the larger group of practices participating in PCF based on the characteristics we considered. Of the original sample, nine practices declined to participate because of competing demands on their time, five were ineligible because they had withdrawn from PCF after we drew the sample, and 11 did not respond to our request for an interview. We replaced these 25 practices with practices from the same stratum whenever possible. We stopped data collection after completing 49 (of 50) interviews because the responses we were receiving indicated we had reached saturation.

Exhibit A.1.5.4. Comparison of practices selected for care delivery interviews with all practices participating in PCF

Practice characteristics	Practices selected for interviews (N = 50)		All participating practices (N = 2,717)	
	Number	Percent	Number	Percent
Cohort				
1	18	36%	654	24%
2	32	64%	2,063	76%
Risk group				
1 and 2	42	84%	2,664	98%
3 and 4	8	16%	53	2%
Hospital system^a				
Yes	31	62%	1,896	70%
No	19	38%	718	26%
Size				
Small (0–3 practitioners)	18	36%	1,028	38%
Medium (4–9 practitioners)	22	44%	1,327	49%
Large (10 or more practitioners)	10	20%	362	13%
Location^a				
Urban	42	84%	2,147	79%
Suburban	4	8%	322	12%
Rural	3	6%	145	5%

Source: Mathematica's analysis of data from Primary Care First Practice Portal (2021 for Cohort 1 and 2022 for Cohort 2); PCF participation roster as of October 2022; and IQVIA (2021 for Cohort 1 and 2022 for Cohort 2).

Note: Practices limited to active status as of October 2022. Of the original sample, nine practices declined to participate because of competing demands on their time, five were ineligible because they had withdrawn after we drew the sample, and 11 did not respond to our request for an interview. We replaced these 25 practices with practices from the same stratum whenever possible.

^a There are 103 active practices with missing hospital system and location information.

Among the 49 completed practice interviews, we selected a cross-section of 16 practices for the payment interviews. We selected these practices using a combination of the following characteristics: cohort, risk group, CPC+ experience, and performance-based adjustment results.

Exhibit A.1.5.5. Proposed distribution of practices for payment interviews

		Sample group	Cohort 1 (N = 10)
CPC+ experience	With CPC+ experience	0	4
	Without CPC+ experience	10	2
Risk group	Risk Group 1 and 2	10	0
	Risk Group 3 and 4	0	6
Performance-based adjustment results	n.a.	0	6
	Positive	4	0
	Neutral	3	0
	Negative	3	0

D. Data collection methodology

Participating practices must submit points of contact to CMS; the responsibilities and job titles of these people vary widely across organizations. For instance, for practices that were part of a larger health care organization, many of the points of contact often were staff at the system level. In our initial communications with the points of contact, we carefully described our data collection goals and the perspectives we hoped to gain, such as practice administrators, PCF champions or leads, front-line practitioners, care managers, or some combination of these. When a practice belonged to a larger health care system, we interviewed both practice and system representatives.

We conducted interviews toward the end of the second model year, starting in October 2022 and ending in March 2023. Two-person teams interviewed everyone using semistructured protocols, which we tailored to each respondent based on what we knew about their practice from sources such as their portal data or web searches. Interview teams typically asked all questions of all respondents based on time allowed and respondents' knowledge and expertise. We conducted a total of 158 telephone interviews across 49 primary care practices to identify changes to strategies to reduce acute hospitalizations; these interviews included administrative and clinical staff and, as applicable, leadership from the system with which they were affiliated. We conducted 14 interviews with respondents, including business managers and population health managers, to discuss their experiences with the PCF payment methodology.

We audio recorded and transcribed all interviews. We then imported the transcripts into a qualitative data analysis software package and coded the transcripts using a codebook and deductive content analysis techniques. Next, we generated analytic summaries for each coded data segment, taking into consideration the practice's characteristics, such as whether it was affiliated with a larger health care system or had previously participated in CPC+. We then synthesized the findings guided by the causal pathways. Analyses—including how our understanding of the causal pathway has evolved—were specific to each strategy. We also conducted crosscutting analyses that spanned all practices such as facilitators and barriers of implementation success. Analyses of the payment data were specific to the key concepts covered in those interviews.

A.1.6. Methods for identifying and interviewing a sample of parent organizations

A. Introduction

Although PCF is a practice-level intervention, our analysis of the applications for practices in Cohorts 1 and 2 indicated that more than 80 percent of practices active at the end of 2022 belonged to a larger health care organization. In our first-round practice interviews, we found that these larger health care organizations make many of the decisions about PCF implementation, including deciding which practices participate in the model. We also found that larger health care organizations often manage the administrative activities associated with PCF, such as fulfilling reporting requirements, coordinating billing and payment, collecting and analyzing data, and conducting quality improvement. In addition, we found that leaders from these organizations designed and managed many of the strategies implemented by the practices, including which strategies to pursue, how to staff new services, whether to provide additional corporate resources, whether and how to engage their practices, and whether to share the financial risks and benefits of the model with the practices. (Conwell et al. 2022)

In recognition of the role larger health care organizations play as decision makers for their practices, we interviewed leaders from a sample of larger health care organizations (referred to as parent organizations) in round two data collection. Our main purpose was to describe their role in implementing the model, including how they influence the strategies their participating practices adopted as well as the resources they provided to help implement it. Specifically, we sought their perspectives on six questions:

1. Why did the health care organization decide to participate in the PCF Model?
2. How did the health care organization select the practices to participate in the model?
3. What role does the health care organization play in selecting and implementing care delivery strategies under PCF?
4. What resources do health care organizations provide to support practices' implementation of care delivery strategies under PCF?
5. To what extent do health care organizations share the financial risks and rewards under PCF with practices and practitioners?
6. To what extent does being a larger health care organization help or hinder implementation of the PCF strategies at the practice level?

B. Data collection and analysis methods

We conducted and recorded semistructured telephone interviews with 26 people across the 12 sampled parent organizations (one to six people per parent organization) that were responsible for or familiar with decision making about PCF. Informants included clinical and administrative leaders. We interviewed people in February and March 2023. The interviews lasted about 60 minutes and had one lead interviewer and one notetaker to ensure coverage of key interview topics.

After transcribing the interview recordings, the interviewing team applied content codes to cluster passages about the same research question, combining two research questions into one code because

of the expansive nature of interview responses. Exhibit A.1.6.1 shows the codes that the team applied to each research question:

Exhibit A.1.6.1. Number of practices in larger health care organizations based on PCF application data

Research question	Code(s)
3. Why did the health care organization decide to participate in the PCF model?	Reason for Joining
4. How did the health care organization select the practices to participate in the model?	Participation Decisions
5. What role does the health care organization play in selecting and implementing care delivery strategies under PCF?	Resources, Implementation Decisions, and Change
6. What resources do health care organizations provide to support practices' implementation of care delivery strategies under PCF?	Resources, Implementation Decisions, and Change
7. To what extent do health care organizations share the financial risks and rewards under PCF with practices and practitioners?	Payment
8. To what extent does being a larger health care organization help or hinder implementation of the PCF strategies at the practice level?	PCF Overall

Source: Mathematica codebook.

A member of the research team then reviewed each code, summarizing themes across overall responses and for subgroups based on our sampling characteristics (vertical or horizontal organizational affiliation and number of practices participating in PCF). The remaining members of the research team reviewed these summaries for clarity and accuracy.

C. Identifying the sampling frame

The first step in data collection was creating a unique list of all parent organizations that had practices participating in PCF. Our goal in creating a list of parent organizations for round two data collection was to select a sample that reflected a mix of organizational structures and number of participating practices. To do this, we took the following three steps. First, we identified all PCF practices affiliated with a larger health care organization, based on a reconciliation of PCF application data with proprietary IQVIA OneKey data, the latter of which we used to create a matched comparison group. Second, we de-duplicated the list of participating practices affiliated with the same parent organization to obtain a unique list of organizations with practices in PCF. Third, we characterized the health care organizations based on their organizational structure and number of participating practices. We describe each of these steps below.

Identifying practices affiliated with a health care organization

We had two sources for identifying practices that were part of larger health care organization: (1) the practice's PCF application, completed by the practice (or, in some cases, its parent organization) before joining the model, and (2) the OneKey database, a proprietary data set created and updated monthly by IQVIA. Both sources enabled us to identify participating practices affiliated with larger health care organizations with a high degree of overall concordance, but they differed in their ability to characterize the type of organizational structure to which the practice belonged. We wanted to better understand these differences before selecting a dataset to develop our sampling frame. After comparing these two

datasets we ultimately used PCF application data for identifying organizations to interview because of its advantages for identifying different types of larger health care organizations.

The PCF application asked practices to indicate whether they were owned and operated by a larger health care organization, such as a health system or group practice. For those that were part of a larger health care organization, the application asked practices to identify the type of organization with which they were affiliated (using one of five response categories). The application did not define the categories practices were asked to use. We interpreted two response categories as representing a vertically integrated system (which we sometimes refer to as system): (1) part of a hospital system and (2) part of an integrated delivery system. We interpreted two other response categories as representing a horizontally integrated network (HIN): (1) part of a medical group practice and (2) part of a network of individual practices. Practices could also choose a fifth (other) category that we did not consider as either a system or a HIN. We considered practices that selected none of these categories to be independent.

Exhibit A.1.6.2 shows how we classified practices into systems and HINs based on their responses on the PCF application. Just over 80 percent of practices in Cohorts 1 and 2 reported being part of a larger health care organization on their PCF applications. Of these, nearly 80 percent of Cohort 1 practices reported being in a system, and 20 percent said they were in a HIN. The proportion of affiliated practices in a system declined from Cohort 1 to Cohort 2 (79 percent to 62 percent), while the proportion of those who reported being in a HIN rose (20 percent to 35 percent).

Exhibit A.1.6.2. Number of practices in larger health care organization based on PCF application data

Practice is part of:	Cohort 1		Cohort 2	
	Number	Percentage	Number	Percentage
All practices	855	100%	2,239	100%
Practices not in a larger health care delivery organization	131	15%	410	18%
Practices in a larger health care delivery organization	724	85%	1,829	82%
Of those in a larger health care organization:				
Practices in a vertically integrated health care system ^a	570	79%	1,135	62%
Practices in a horizontally integrated network ^b	147	20%	642	35%
Practices in another type of organization ^c	7	1%	52	3%

Source: Mathematica’s analysis of PCF application data, accessed in July 2021.

Note: Counts are based on unique practices, including those that were a single practice when submitting a PCF application but subsequently became two (or more) practices after joining the model. Counts also include practices that withdrew from the model in 2021 and 2022.

^a Vertically integrated health care systems include hospital-based systems and integrated delivery systems.

^b Horizontally integrated networks include medical group practices and networks of individual practices.

^c This includes practices that selected the “Other” organizational category on their PCF application.

PCF = Primary Care First.

IQVIA’s OneKey database also enabled us to identify practices that are part of larger health care organizations, but they offered less detail than the PCF application on the type of organizational structure. The OneKey database included a variable indicating whether a practice was independent. Among those that were not reported as independent, the database provided an additional variable for parent organization type. If parent organization type was reported as integrated delivery network, then

we classified the practice as being in a vertically integrated health care system. There was insufficient information on OneKey to identify the organizational structure for the remaining non-independent practices that had a parent organization type other than integrated delivery network.

Similar to the PCF applications, the OneKey database indicated that just over 80 percent of all practices in PCF had a corporate parent (that is, were part of a larger health care organization) (Exhibit A.1.6.3). A higher proportion of affiliated practices were part of a vertically integrated system in the OneKey database than in the application data (84 percent for both cohorts in OneKey versus 79 percent and 62 percent for Cohorts 1 and 2, respectively, in the application data). OneKey did not allow us to identify practices that were part of an HIN.

Exhibit A.1.6.3. Number of practices in larger health care organization based on OneKey data

Practice is part of:	Cohort 1		Cohort 2	
	Number	Percentage	Number	Percentage
All practices	845	100%	2,221	100%
Practices without a corporate parent (independent)	146	17%	380	17%
Practices with a corporate parent (system affiliated)	699	83%	1,841	83%
Among practices with a corporate parent:				
Practice is part of a health care system ^a	589	84%	1,548	84%
Practice is not part of a health care system ^b	110	16%	293	16%

Source: Mathematica’s analysis of OneKey data, accessed in October 2021.

Note: Counts exclude nine practices with missing data. Counts include practices that withdrew from the model in 2021 and 2022. Several practices that merged into a single practice after joining PCF were reported separately in OneKey. The total counts in Exhibit A.1.6.3 are slightly larger than the counts presented in Exhibit 2.6 because of the additional exclusion criteria (the practice had to have had at least some assigned beneficiaries and have been operational in 2020) applied in Chapter 2.

^a Health care system is defined as integrated delivery networks.

^b This includes practices that are not independent and had a parent organization type other than integrated delivery network.

PCF = Primary Care First.

Exhibit A.1.6.4 compares the organizational affiliation results of the PCF application data and the OneKey database for both cohorts combined. The two sources were similar on the number and percentage of PCF practices affiliated with larger health care organizations, but OneKey showed a higher proportion of practices in vertically integrated systems in total than the application data did (84 percent versus 68 percent). Most of the discrepancy is likely because of the OneKey database providing fewer details on organizational structure than the application. The comparison suggests that OneKey data overcounts the number of practices in a vertically integrated health care system. We could not classify 16 percent of system-affiliated practices in OneKey based on their organizational structure.

Exhibit A.1.6.4. Comparison of system-affiliation results from PCF application data versus the OneKey database

Practice is part of:	PCF application		OneKey	
	Number	Percentage	Number	Percentage
All practices	3,094	100%	3,066	100%
Practices that are part of a larger health care organization	2,494	81%	2,540	83%
Of those that are part of a larger health care organization:				
Practices that are part of a vertically integrated health care system	1,705	68%	2,137	84%
Practices that are part of a horizontally integrated network	789	32%	NA	NA
Not classified	0	0%	403	16%

Source: Mathematica’s analysis of PCF applications, accessed in July 2021, and OneKey data, accessed in October 2021.

Note: Totals from application and OneKey are not equal because (1) application data count unique practices, including those that were one practice when they submitted an application but became two (or more) practices after joining the model, and (2) OneKey excludes nine practices with missing data.

NA = not available; PCF = Primary Care First.

Of the 2,642 practices classified as affiliated with a larger health care organization in *either* OneKey or the application data, 90 percent were in agreement overall (Exhibit A.1.6.5). In all, 4 percent were identified as affiliated in the application data only, and 6 percent were identified as affiliated in the OneKey data only. The lack of concordance was in part because of missing data in OneKey and differences in when the information was reported.

Exhibit A.1.6.6 illustrates the concordance for *system affiliation* specifically between the two sources. Of the 2,219 practices reported as being in a vertically integrated health care system in *either* of the two sources, almost three-quarters (73 percent) were classified as such in both. Although 4 percent were reported as being part of a system in application data only, nearly one-quarter (23 percent) were reported as such in OneKey data only. As noted, the high number of practices classified as being in a health care system in OneKey likely stems from a lack of detail on the organizational structure of practices in this source. OneKey provides less specificity on the type of affiliation among practices in larger health care organizations. Of the 514 practices

Exhibit A.1.6.5. Concordance in the number of practices in a larger health care delivery organization

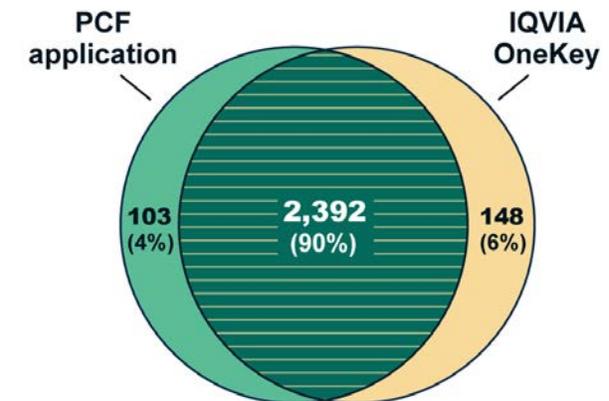
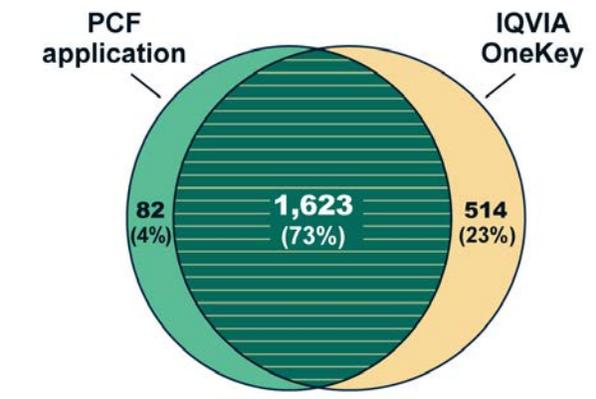


Exhibit A.1.6.6. Concordance in the number of practices in a health care system



reported as being part of a system in OneKey only, nearly 90 percent were classified as being in an HIN in the application data.

Linking practices affiliated with the same health care organization

After identifying practices owned and operated by a larger health care organization in the PCF application data, the second step in creating a list of larger health care organizations was to convert the practice-level file to an organization-level file using information on PCF applications. We used a combination of organization name (cleaned to link organizations with different capitalizations and punctuation), mailing address, and point-of-contact email domain and telephone number to match organizations. Practices provided the name of the health care organization on their application, but slight differences in the free text field required us to occasionally make subjective judgments to create an organization-level file. (For example, after reviewing the applications, we determined that Providence Health and Services, Providence Health Services, Providence St. Joseph Health, and Providence St. Joseph represented the same health care organization.)

We then assigned organization-level identifiers to each health care organization. If practices within the same organization provided mixed responses or selected “Other” as their organizational type, we excluded them from the sampling frame. To minimize burden, we also excluded from the sampling frame parent organizations that had a practice that participated in either of our round one or round two practice-level samples because, when applicable, respondents from parent organizations often participated in their practices’ interviews. In the end, we identified 160 unique health care organizations with at least one practice participating in PCF, which we used as our sampling frame for round two practice interviews.

Describing health care organizations with a practice participating in PCF

For each of the 160 organizations in our sampling frame, we created a database with five organizational characteristics likely to be associated with their experiences in PCF: organizational structure and number of affiliated practices as well as the cohort(s), risk group(s), and CPC+ experience of their affiliated practices. We selected organizational structure and size as sampling characteristics because of the potential effect on PCF experience. For example, practices in a vertically integrated system might have fewer incentives to reduce inpatient care in their member hospitals. Practices in vertically integrated systems might also have better access to patient data on emergency room visits and hospital admissions and discharges than practices in HINs. The size of a health care organization is also likely to influence practices’ experience in PCF. For example, larger organizations might have more resources than smaller organizations to invest in shared staffing, training, infrastructure, and protocols.

As Exhibit A.1.6.7 shows, more than half (56 percent) of the health care organizations with at least one affiliated practice participating in PCF were vertically integrated health care systems (that is, they included a hospital) at the time of application. The distribution of organizations is also heavily skewed toward a small number of participating practices, with 16 percent having just one practice participating in PCF. We decided to include these organizations in our sampling frame for two reasons. First, even though only one practice was participating in PCF, the organization likely had other (nonparticipating) practices and could leverage its corporate resources to facilitate changes within the single practice participating in the model. Second, knowing why only one practice (or a relatively small number of

practices) within a larger health care organization participated in the model could help us understand where and why improvements in outcomes are likely to be achieved. Most organizations in our sampling frame had some (or only) Cohort 2 practices, most had practices in risk groups 1 and 2 only, and most had practices with CPC+ experience.

Exhibit A.1.6.7. Number and percentage of health care delivery organizations with practices in PCF

Characteristics of health care organizations	Health care organizations with a practice in PCF	
	Number	Percentage
Number of organizations	160	100%
Type of organizational structure		
Vertically integrated system	89	56%
Horizontally integrated network	71	44%
Number of affiliated practices in PCF		
1 practice	25	16%
2 to 4 practices	36	23%
5 to 9 practices	46	29%
10 to 24 practices	36	23%
25 to 49 practices	13	8%
More than 49 practices	4	3%
PCF cohorts of affiliated practices		
Practices in Cohort 1 only	17	11%
Practices in Cohort 2 only	93	58%
Practices in Cohorts 1 and 2	50	31%
PCF risk groups of affiliated practices		
Practices in risk groups 1 and 2 only	139	87%
Practices in risk groups 3 and 4 only	6	4%
Practices in risk groups 1 to 4	15	9%
CPC+ experience of affiliated practices		
Organizations with practices that have CPC+ experience	142	89%
Organizations with no practices that have CPC+ experience	18	11%

CPC+ = Comprehensive Primary Care Plus; PCF = Primary Care First.

D. Selecting a sample of health care organizations to interview

We sought to interview leaders from a total of 12 health care organizations, stratified equally by organizational structure (vertically integrated system versus HIN) and size (based on the number of participating practices). We selected this target number of organizations because we believed, based on the previous year’s interviews, it would achieve thematic saturation by organizational type while minimizing the reporting burden on PCF organizations overall. The sample size, however, did not permit us to stratify on other characteristics that could have influenced practices’ experience (for example, CPC+ experience, cohort, or risk group). Exhibit A.1.6.8 describes the 12 health care organizations recruited for interviews.

Exhibit A.1.6.8. Number and characteristics of parent organizations interviewed, from November 2022 to March 2023

Characteristic	Number
Total	12
Vertically integrated system	6
Small (1 to 3 practices in PCF)	2
Medium (4 to 8 practices in PCF)	2
Large (9 or more practices in PCF)	2
Horizontally integrated network	6
Small (1 to 3 practices in PCF)	2
Medium (4 to 6 practices in PCF)	2
Large (7 or more practices in PCF)	2
Cohort	12
Practices in Cohort 1 only	0
Practices in Cohort 2 only	11
Practices in Cohorts 1 and 2	1
CPC+ experience	12
With CPC+ experience	12
Without CPC+ experience	0

Source: PCF application data, 2022.

Note: The number of PCF-affiliated practices in vertically integrated systems ranged from 2 to 17 (with an average of 8 practices per system). The number of PCF-affiliated practices in horizontally integrated networks ranged from 1 to 8 (with an average of 5 practices per network).

A.1.7. Practice exit interviews

From January to December 2022, a total of 395 practices withdrew (either voluntarily or through termination by CMS) from PCF; these practices were the sampling frame for our interviews. We then excluded the practices that CMS terminated for noncompliance (54) and the practices that closed (14), merged (50), or were acquired (five) by another practice or health care system. Finally, we excluded practices that withdrew because they did not meet the beneficiary threshold requirement (four) and one practice in Cohort 2 that withdrew before the Cohort 2 launch date and never officially participated in the model.

From the 266 practices remaining in our sample, we strove for a diversity of experiences and perspectives based primarily on the reason for withdrawal that practices reported to CMS. We grouped practices into strata that reported similar reasons for withdrawing and were thus likely to have similar perspectives.

There was a total of 121 sampling units (35 health care organization-level units and 86 practice-level units) because many of the 266 practices in our exit interview sample were affiliated with each other via the same vertically integrated health system or horizontally integrated network. Because these practices were not independent from one another (and likely had similar reasons for withdrawing), we grouped

them at the parent organization level and treated practices affiliated with the same parent organization as a single sampling unit.

In the end, we interviewed 12 of the 121 sampling units: seven at the parent organization level and five at the individual practice level. We contacted 40 practices to meet our targeted number of 12 completed interviews, which we believed would be a sufficient number of interviews to yield a range of perspectives on practices' decisions to withdraw. Interviews were generally 30 minutes, and we offered a \$100 gift card for participation.

Each interview consisted of a primary interviewer, notetaker, and respondents and was audio recorded. Immediately after the interview, the interview team met to discuss the major takeaways, after which the notetaker edited the detailed interview notes. The interview team used these notes to identify and summarize key themes across all respondents.

Appendix A.2. Additional methodological details of processing and analyzing secondary data

A.2.1. Attribution and assignment

Attribution is a methodology used to identify the group of beneficiaries served by a particular practitioner, practice, or health system. CMS attributes beneficiaries to each PCF practice to calculate population-based payments (PBPs) and to track PCF beneficiaries' utilization and costs for performance-based adjustments (PBAs). Similarly, for the evaluation, we attribute beneficiaries to each PCF practice and to comparison practices so that we can test whether beneficiaries served by PCF practices experience better care or have lower Medicare spending than beneficiaries served by comparison practices.

In this section, we first explain the purpose of beneficiary attribution for this evaluation, which is distinct from how beneficiaries are attributed to practices for the purpose of calculating payments to PCF practices (Section A). We then describe the steps we use to attribute beneficiaries to PCF and comparison practices and explain how quarterly attribution informs our evaluation's intent-to-treat (ITT) approach to assigning beneficiaries to the first practice to which they were attributed (Section B). In short, we *attribute* beneficiaries each calendar quarter to the practice where they received their most recent Medicare Annual Wellness Visit, including Welcome to Medicare Visits, or the practice where they received the plurality of their primary care services in the previous two years. We then *assign* beneficiaries to the practice to which they were first attributed during the baseline period (the two years before PCF launch) or the intervention period (starting with the PCF launch), depending on the analysis. In Section C, we compare how our evaluation attribution process differs from CMS' process of attributing beneficiaries for payment. Finally, in Section D, we explore differences between the samples of beneficiaries attributed to PCF practices using the two processes.

A. Description of beneficiary attribution

PCF provides each participating practice with PBPs and flat visit fees (FVFs) for its Medicare FFS beneficiaries. To determine the payments that practices receive, CMS attributes beneficiaries to determine the size and acuity of the Medicare FFS population receiving regular continuous care from the practice. The PCF payment attribution uses Medicare administrative data (including claims and enrollment data) to identify the Medicare FFS beneficiaries associated with each PCF practice.³⁰

As part of our evaluation of PCF, we use a similar claims-based attribution process to attribute Medicare beneficiaries, but our attribution methodology differs slightly from payment attribution so we can attribute beneficiaries not only to PCF practices but also to non-PCF practices that we include in the evaluation's comparison group. We attribute eligible Medicare beneficiaries to practices for each calendar quarter: for this report, this period includes eight baseline quarters each for Cohort 1 (2019 and 2020) and Cohort 2 (2020 and 2021) practices, eight intervention quarters for Cohort 1 practices (2021 and 2022), and four intervention quarters for Cohort 2 practices (2022).

³⁰ Please see CMS' PCF Payment and Attribution Methodologies for details on payment attribution, which includes voluntary alignment (Center for Medicare & Medicaid Innovation 2023). We summarize differences between this and our evaluation attribution methods in Exhibit A.2.1.4.

B. Attribution methodology

The PCF evaluation attribution process has six steps:

1. We identify the set of primary care practices that compete for beneficiaries in the attribution process.
2. Because Medicare claims report the practitioners (rather than the practice) who provided services, we group practitioners into the practices identified in the first step; we define a practice as being composed of a unique group of practitioners at a given point.
3. We identify the set of Medicare beneficiaries eligible for attribution.
4. We specify the set of primary care services considered when determining whether a beneficiary receives regular care from each practice.
5. We use the information from the above steps to attribute each eligible Medicare beneficiary to a single practice in each quarter.
6. We assign each beneficiary during the baseline and intervention periods to the first practice to which they were attributed.

Step 1. Identify primary care practices

We start with a roster of all practices in the United States with at least one practitioner (defined as a physician, nurse practitioner, physician assistant, or clinical nurse specialist) with a primary care specialty (defined for physicians as specializing in family practice, general practice, geriatrics, or internal medicine). Each practice is intended to be a single physical location or practice site. (For practice organizations with several sites, each site is considered a distinct practice.) We define each practice for attribution as comprising a unique group of practitioners who work at the address at a given point. We purchased yearly rosters from 2019 to 2022 from IQVIA, a commercial health care data vendor that maintains and verifies lists of practitioners who work in practices throughout the United States. The IQVIA OneKey database contains information about practices (such as name and physical location), the providers affiliated with the practice (such as name, specialty, and National Provider Identifier [NPI]), and corporate parents of the practices (including ownership type and name). We augment the OneKey data with practitioner specialty taxonomy codes and fill in missing NPIs by linking practitioner-level OneKey data with the National Plan and Provider Enumeration System (NPPES) NPI registry. We then identify PCF practices within the roster of OneKey practices using a combination of address, name, and practitioner information matched to CMS records on PCF participants. For PCF practices not found in the OneKey data, we append practice and practitioner information from those practices' PCF application data.

Although we had extensive validated information about PCF practices from their applications and subsequent roster files, for the purposes of our evaluation, we opted to identify practice and practitioner information—such as location and specialty—from the same OneKey data source for each year. As part of the evaluation, we constructed a matched comparison group of practices not participating in PCF, so we must rely on OneKey data for those practices' practitioner composition. By using OneKey data for all practices, we remove bias that could result from using different data sources for PCF versus non-PCF practices.

Step 2. Group practitioners into practices

To facilitate attribution for the evaluation, we construct a roster of practitioners working at primary care practices across the United States and their associated TINs (and CMS Certification Numbers [CCNs], when applicable).

Step 2.1. Create initial roster of NPIs from yearly OneKey rosters

As a starting point, we use practitioner rosters purchased from IQVIA for 2019 to 2022. (We use the 2019 roster to reflect practice composition for years 2017 to 2019.) The rosters link a unique practice identifier to a list of practitioners affiliated with the practice in each year. Providers can be affiliated with multiple practices in a given year in the OneKey data, so to better reflect PCF's participation rules, we choose a single practice for each practitioner for each year, preferring to keep a practitioner affiliated with a practice consistently over time.

We found about 71 percent of the practice–practitioner combinations from PCF application rosters in the rosters we created from OneKey data for 2022, which suggests that although OneKey data do not exactly reflect the practice–practitioner compositions listed in PCF rosters, our roster captures a high proportion of them.

Step 2.2. Assign TINs to each practice for each year.

Because OneKey data do not include TINs, we use claims data to assign a TIN to a practice for each year from 2018 to 2022.^{31,32} To do so, we select the TIN most frequently billed in Medicare claims data for primary care services by the NPIs of primary care practitioners in each practice. For each year, we assign the TIN based on claims in that year and then we maintain the TIN assigned to the practice based on claims occurring during the year before and year after that year.³³

Step 3. Identify Medicare beneficiaries eligible for attribution

We start with the list of beneficiaries who had at least one eligible primary care visit (see Step 4 for the list) with any NPI with a primary care specialty, as determined in Steps 1 and 2. Following the payment

³¹ We chose not to assign a TIN in 2017, which we needed to attribute beneficiaries in 2019, because the practice rosters would have been too out of date to reliably assign a TIN. Rather, we rely on our backdating of the 2018 TIN, which we describe in more detail later in the paragraph.

³² For PCF practices, we examined the overlap between the assigned TINs and reported TINs in the PCF application: for nearly 99 percent of practices, at least one assigned TIN was also on the PCF roster. Using the assigned TINs in attributing beneficiaries, rather than using TINs on the application, increases the risk of misattributing beneficiaries to PCF practices if we assigned an incorrect or invalid TIN to those practices.

³³ Specifically, we use these historical and backdated TINs to avoid cases in which TINs switched mid-year and we only capture one of the two TINs because we use a plurality approach to assigning TINs for a given year.

attribution methodology, we then limit the pool of beneficiaries who meet the following eligibility criteria in a given calendar quarter, as indicated by the Medicare enrollment database: (1) are enrolled in Medicare Part A and Part B at the start of the quarter, (2) have Medicare as their primary payer, (3) are not covered under a Medicare Advantage or other Medicare health plan, (4) are not incarcerated, (5) are not institutionalized, and (6) are alive at the start of the quarter. These criteria ensure we can reliably measure beneficiaries’ outcomes in the Medicare FFS claims data, unlike, for example, for beneficiaries enrolled in a Medicare Advantage plan.

Step 4. Identify primary care claims used in attribution

We next narrow the universe of all billed Medicare services to the primary care services used in beneficiary attribution. There are four criteria for a claim to be used in attribution for a given quarter: claim type, claim date, service type, and specialty of the practitioner who provided the service.

Claim type. For attribution, we use national Medicare FFS physician (Part B carrier) and outpatient claims. Most attribution-eligible visits are in the physician claims file, except claims submitted by critical access hospitals, which are in the outpatient file. Similar to CMS’ payment attribution approach, our approach excludes claims from Federally Qualified Health Centers (FQHCs) and Rural Health Clinics (RHCs).³⁴

Claim date. We use primary care services occurring during a two-year lookback period in the attribution process. This is the same as for the payment attribution, although we use a slightly different lookback period. For each quarter, our lookback period is the 24-month period that ends the day before the quarter (Exhibit A.2.1.1). For example, for the first quarter of 2019, we use claims from January 1, 2017, to December 31, 2018. (In contrast, for the payment attribution, the lookback period is lagged by three months to allow prospective payments. See Section C of this appendix for more detail.) We extracted the claims for this report between February 2022 and September 2023.

Exhibit A.2.1.1. Lookback periods used in attribution

Attribution quarter	Lookback period
Q1 2019	1/1/2017 to 12/31/2018
Q2 2019	4/1/2017 to 3/31/2019
Q3 2019	7/1/2017 to 6/30/2019
Q4 2019	10/1/2017 to 9/30/2019
Q1 2020	1/1/2018 to 12/31/2019
Q2 2020	4/1/2018 to 3/31/2020
Q3 2020	7/1/2018 to 6/30/2020
Q4 2020	10/1/2018 to 9/30/2020
Q1 2021	1/1/2019 to 12/31/2020
Q2 2021	4/1/2019 to 3/31/2021
Q3 2021	7/1/2019 to 6/30/2021

³⁴ This restriction means that, in payment and evaluation attribution, even if beneficiaries have most of their care or their most recent visits at an FQHC or RHC, they would not be attributed to that practice. Rather, they would be attributed to the practice that provided the plurality of their services if they had visits at a practice other than the FQHC or RHC during the lookback period or would not be attributed at all for that quarter if all of their visits were at the FQHC or RHC.

Attribution quarter	Lookback period
Q4 2021	10/1/2019 to 9/30/2021
Q1 2022	1/1/2020 to 12/31/2021
Q2 2022	4/1/2020 to 3/31/2022
Q3 2022	7/1/2020 to 6/30/2022
Q4 2022	10/1/2020 to 9/30/2022

Q = quarter.

Service type. We limit claims to eligible primary care services using the Current Procedural Terminology (CPT) code reported on each claim. Exhibit A.2.1.2 lists the CPT codes of services we consider to be related to primary care, which follows the list CMS uses for PCF payment attribution (Center for Medicare & Medicaid Innovation 2023). Annual Wellness Visits (AWVs), including Welcome to Medicare Visits, receive precedence in the attribution algorithm, as we describe in Step 5.

Exhibit A.2.1.2. Primary care services eligible for attribution

Service	CPT codes
Office or outpatient visit E&M	99201–99205, 99211–99215
Prolonged non-face-to-face E&M	99358
Home care	99324–99328, 99334–99337, 99339–99345, 99347–99350
Welcome to Medicare and Annual Wellness Visits	G0402, G0438, G0439
Advance care planning	99497
Collaborative care model	G0502–G0504, 99492–99494
Cognition and functional assessment for patient with cognitive impairment	G0505, 99483
Outpatient clinic visit for assessment and management (critical access hospitals only)	G0463
Transitional care management services	99495–99496
Chronic care management services	99490
Complex chronic care management services	99487
Assessment or care planning for patients requiring chronic care management services	G0506
Care management services for behavioral health conditions	G0507, 99484, 99491
Prolonged services without face-to-face contact	99358

CPT = Current Procedural Terminology; E&M = evaluation and management.

Specialty of practitioner who provided service. Only claims that have a practitioner with a primary or secondary specialty of primary care, based on NPPES specialty information, are included in attribution (Exhibit A.2.1.3). This differs slightly from payment attribution methodology, in which claims are considered for all practitioners in PCF practices regardless of their specialty.

Exhibit A.2.1.3. Practitioner primary care specialty codes

Specialty	Healthcare Provider Taxonomy Code
Family Medicine	207Q00000X
Adult Medicine	207QA0505X
Geriatric Medicine	207QG0300X
Hospice and Palliative Medicine	207QH0002X
General Practice	208D00000X
Internal Medicine	207R00000X
Geriatric Medicine	207RG0300X
Hospice and Palliative Medicine	207RH0002X
Clinical Nurse Specialist	364S00000X
Acute Care	364SA2100X
Adult Health	364SA2200X
Chronic Care	364SC2300X
Community Health/Public Health	364SC1501X
Family Health	364SF0001X
Gerontology	364SG0600X
Holistic	364SH1100X
Women's Health	364SW0102X
Nurse Practitioner	363L00000X
Acute Care	363LA2100X
Adult Health	363LA2200X
Community Health	363LC1500X
Family	363LF0000X
Gerontology	363LG0600X
Primary Care	363LP2300X
Women's Health	363LW0102X
Physician Assistant	363A00000X
Medical	363AM0700X

Note: Specialties in bold correspond to level II classification categories in the National Uniform Claim Code list, and specialties without bold are subcategories for areas of specialization.

Step 5. Running the attribution algorithm

After we identify eligible beneficiaries and their eligible primary care services, we apply the following algorithm to attribute beneficiaries based on AWWs, including Welcome to Medicare Visits, or the plurality of services (shown in Exhibit A.2.1.2). If a beneficiary had one or more AWWs during the two-

year lookback period, we attribute the beneficiary to the practice that provided the *most recent* visit. Otherwise, if the beneficiary had other eligible primary care services, we attribute the beneficiary based on the plurality of those services occurring at a practice during the two-year lookback period for that quarter.³⁵ This mirrors the algorithm used for PCF model payments as of 2023.

The payment attribution removes beneficiaries with end-stage renal disease (ESRD) or use of hospice services at this stage, as long as those beneficiaries were not previously attributed to a PCF practice. In the evaluation attribution algorithm, we instead impose a similar restriction as part of Step 6 (assignment), at which time we can determine whether a beneficiary had ESRD or used hospice services as of the start of that beneficiary's baseline or intervention periods. Exhibit A.2.1.4 of this appendix describes differences between the evaluation and payment attribution methodologies in more detail.

Step 6. Assigning beneficiaries based on attribution

For this report, we conducted assignment twice.

Reach analysis. For the analysis in Chapter 2, comparing PCF practices and applicants with other practices in their regions, we assigned beneficiaries during baseline (that is, before PCF began) to the practice to which they were attributed in the first quarter of 2020. For this assignment, we simply assigned beneficiaries to the practice to which they were attributed in the first quarter of 2020. This enables us a straightforward comparison between PCF practices and others in their regions.

Impact analyses. For the impact analyses shown in Chapters 5 and 6, we assigned beneficiaries during baseline (that is, before PCF began) and, separately, during the intervention period, to the first PCF or comparison practice to which they were attributed during the relevant period, following an ITT approach. Beneficiaries first attributed to a practice that is neither a PCF practice nor a selected comparison practice could later become assigned to a PCF or comparison practice if attributed there.

Through this assignment method, a beneficiary would continue to be assigned to the same practice for the entire period (either baseline or intervention), regardless of whether the beneficiary continued to receive care at that practice, as long as they were eligible in those subsequent quarters based on the eligibility criteria listed in Step 3. By tracking beneficiaries as part of their initial practice during either period, ignoring any practice switching, we remove potential contamination of the comparison group, particularly during the intervention period. For example, if a beneficiary switches from receiving care at a PCF practice to receiving care at a comparison practice, we continue to count the beneficiary among the group that might have benefitted from the intervention. To better reflect the care that beneficiaries receive over time, however, we allow beneficiaries to change practice assignment between baseline and intervention periods. We created additional assignment rules for calendar year 2021, which is both an intervention year for Cohort 1 practices and a baseline year for Cohort 2 practices. This is to prevent a situation in which a beneficiary might be simultaneously assigned to both a Cohort 1 PCF or comparison practice for the intervention period and a Cohort 2 practice for the baseline period and is then assessed for impacts twice. In these instances of assignment conflict, we preferentially assign beneficiaries to

³⁵ Ties are broken by choosing the practice that provided the most recent service to the beneficiary; if ties remain, the beneficiary is attributed to a OneKey practice over an NPI not in OneKey. Any remaining ties are attributed to one of the remaining practices at random.

Cohort 1 practices over Cohort 2 practices. This prevents a beneficiary from contributing to the baseline of a Cohort 2 practice while receiving the benefit of the PCF intervention from a Cohort 1 practice.

C. Differences between evaluation and payment beneficiary attribution methods

Our evaluation attribution method identifies Medicare beneficiaries attributed to any practice in each quarter using roughly the same claims-based attribution method that CMS uses to attribute beneficiaries for PCF payments. Our attribution approach for the evaluation, however, differs in the following ways (Exhibit A.2.1.4):

C.1. The evaluation approach uses practitioner rosters from OneKey data for PCF and non-PCF practices

Payment attribution uses rosters of practitioners that practices participating in PCF (or, until the end of 2021, participating in CPC+) submit to CMS to determine the composition of practices and their practitioner NPIs and TINs. To maintain consistency for all practices in our analytic population, including those not participating in PCF or CPC+, the evaluation uses a OneKey roster to identify the practitioners affiliated with a practice each year and assigns TINs to practices each year by selecting the most frequently billed TIN in Medicare claims for primary care services by those practitioners in the relevant year, the previous year, and the subsequent year.

C.2. The evaluation lookback period begins immediately before the start of the quarter

Because of the prospective nature of payment attribution, CMS attributes beneficiaries using a two-year lookback period that ends three months before the start of that attribution quarter. For example, CMS attributed beneficiaries for the first quarter of 2021, which started January 1, 2021, based on claims from October 1, 2018, to September 30, 2020. For the evaluation, however, the three-month gap between the lookback period and attribution quarter is unnecessary because we want to identify the most appropriate sample of beneficiaries attributed to PCF practices without a need for calculating payments, outcomes, or any other characteristic prospectively. For this reason, the evaluation attribution uses a two-year lookback period ending the day before the start of the attribution quarter. For example, we attribute beneficiaries for the first quarter of 2021 based on claims from January 1, 2019, to December 31, 2020.

Relatedly, the beneficiary eligibility requirements reflect the different timing of the two methods. For payment attribution, CMS checks for eligibility one month before the start of the attribution quarter, but for the evaluation, we determine eligibility at the beginning of the quarter. For example, for attributing beneficiaries in the first quarter of 2020, beneficiaries had to meet the eligibility requirements described in Step 3 as of December 2019 to be eligible for payment attribution, and those beneficiaries would have had to meet requirements as of January 2020 to be eligible to be attributed for the evaluation.

C.3. The evaluation approach does not consider voluntary alignment or, for the earliest quarters, give priority to chronic care management services

For payment attribution, CMS first attributes the beneficiaries who voluntarily attested that an eligible practitioner in a PCF (or, until the end of 2021, CPC+) practice is their primary care physician. Because potential comparison practices have no real incentive to encourage beneficiaries to use voluntary

alignment, we cannot replicate the voluntary alignment criterion adequately for the potential comparison group we constructed for the evaluation, so we do not include it in our attribution algorithm. Diagnostics from payment attribution indicate that few beneficiaries are attributed based on voluntary alignment: fewer than 0.5 percent of beneficiaries attributed to PCF practices in the first quarter of 2021 voluntarily attested to a practitioner; further, 80% of these voluntarily aligned beneficiaries would have been attributed to the same PCF practice based on claims.

In addition, CMS changed its attribution rules between the 2021 PCF performance year and the 2022 PCF performance year, and the evaluation approach adopted the 2022 change for all periods. Specifically, the payment attribution rules set forth in 2022 no longer attribute beneficiaries based first on the most recent chronic care management services received. (Instead, these services are treated like any other primary care service when calculating the plurality of services provided.) The evaluation applied this change for all attribution quarters to ensure a consistent definition of the study population over time.

Exhibit A.2.1.4. Similarities and differences between beneficiary attribution methods for payment and evaluation

	Payment attribution	Evaluation attribution
Similarities between methods		
Frequency of attribution	Quarterly	Same as payment attribution
Beneficiary eligibility criteria for observability	<ol style="list-style-type: none"> 1. Be enrolled in Medicare Part A and B 2. Not be covered under Medicare Advantage or other Medicare health plan 3. Not be incarcerated 4. Be alive 	Same as payment attribution
Criteria used to identify eligible services for attribution	Evaluation and management HCPCS codes (Exhibit A.2.1.2)	Same as payment attribution
Differences between methods		
Attribution algorithm for 2019 and 2020	Beneficiaries not attributed for payment for quarters before the start of the intervention	Attributed based on the following hierarchy: <ol style="list-style-type: none"> 1. Practice at which the beneficiary received most recent Annual Wellness Visit or Welcome to Medicare Visit 2. Practice at which the beneficiary received the plurality of their eligible primary care services

Appendix A.2. Additional methodological details of processing and analyzing secondary data

	Payment attribution	Evaluation attribution
Attribution algorithm for 2021	<p>Attributed based on the following hierarchy:</p> <ol style="list-style-type: none"> 1. Practice to which the beneficiary is voluntarily aligned 2. Practice at which the beneficiary received most recent chronic care management 3. Practice at which the beneficiary received most recent Annual Wellness Visit or Welcome to Medicare Visit 4. Practice at which the beneficiary received the plurality of their eligible primary care services 	Same as for 2019 and 2020
Attribution algorithm for 2022	<p>Attributed based on the following hierarchy:</p> <ol style="list-style-type: none"> 1. Practice to which the beneficiary is voluntarily aligned 2. Practice at which the beneficiary received most recent Annual Wellness Visit or Welcome to Medicare Visit 3. Practice at which the beneficiary received the plurality of their eligible primary care services (including chronic care management) 	Same as for 2019 to 2021
Criteria used to identify eligible practitioners for attribution	Practitioners in PCF and CPC+ rosters and those with NPPES primary or secondary specialty of primary care not in rosters (Exhibit A.2.1.3)	Practitioners affiliated with OneKey practices as well as those not in OneKey data, all restricted to those with NPPES primary or secondary specialty of primary care (Exhibit A.2.1.3)
Source for practice and practitioner rosters	PCF and (through 2021) CPC+ participation rosters, with all nonparticipating providers (all other NPI-TIN combinations observed in claims) competing as though they were single-provider practices	OneKey
Source for TINs	PCF and (through 2021) CPC+ participation rosters, with all nonparticipating providers (all other NPI-TIN combinations observed in claims) competing as though they were single-provider practices	Assigned TIN based on claims of practitioners affiliated with practices in OneKey

Appendix A.2. Additional methodological details of processing and analyzing secondary data

	Payment attribution	Evaluation attribution
Practices and practitioners with which PCF practices compete for beneficiaries	NPI-TIN combinations grouped as CPC+ practices in model rosters through 2021; NPI-TIN combinations not in PCF rosters or (2021 only) in CPC+ rosters but observed in claims	NPI-TIN combinations grouped as non-PCF practices in OneKey with an assigned TIN and at least one primary care provider; NPI-TIN combinations not in OneKey but observed in claims
Additional beneficiary eligibility criteria	<ol style="list-style-type: none"> 1. Cannot have ESRD or be in hospice when first attributed 2. Cannot be in a long-term care institution 3. Cannot be in a shared savings initiative other than the Medicare Shared Savings Program, primary care transformation efforts, or state-based reform efforts 	<ol style="list-style-type: none"> 1. Cannot have ESRD or be in hospice when first attributed during baseline or when first attributed during intervention 2. Cannot be in a long-term care institution in the quarter of attribution 3. No restrictions based on participation in other programs
Time frame of evaluating eligibility	One month before the start of the quarter	Day of the start of the quarter
Lookback period for claims	Two years ending three months before the start of the quarter	Two years ending the day before the start of the quarter
Tiebreaking for practices competing for attribution	Preference given to PCF and CPC+ practices over single NPIs not in PCF and CPC+ rosters	Preference given to OneKey practices over single NPIs not in OneKey, but no preference between PCF and non-PCF practices in OneKey

CPC+ = Comprehensive Primary Care Plus; ESRD = end-stage renal disease; HCPCS = Healthcare Common Procedure Coding System; NPI = National Provider Identifier; NPPES = National Plan and Provider Enumeration System; PCF = Primary Care First; TIN = Taxpayer Identifier Number.

D. Quantifying the overlap in beneficiaries using evaluation and payment beneficiary attribution methods

Overall, the beneficiary population attributed to PCF practices used for the evaluation has a high degree of overlap with the attributed beneficiary population CMS used to calculate PCF payments. Exhibit A.2.1.5 illustrates this by showing the overlap for one calendar quarter for pooled Cohort 1 and Cohort 2 practices. Specifically, we used beneficiaries attributed for the evaluation in the last quarter before PCF launched (2020 Q4 for Cohort 1 and 2021 Q4 for Cohort 2) and compared them with those attributed for payment in the first quarter of the PCF model (2021 Q1 for Cohort 1 and 2022

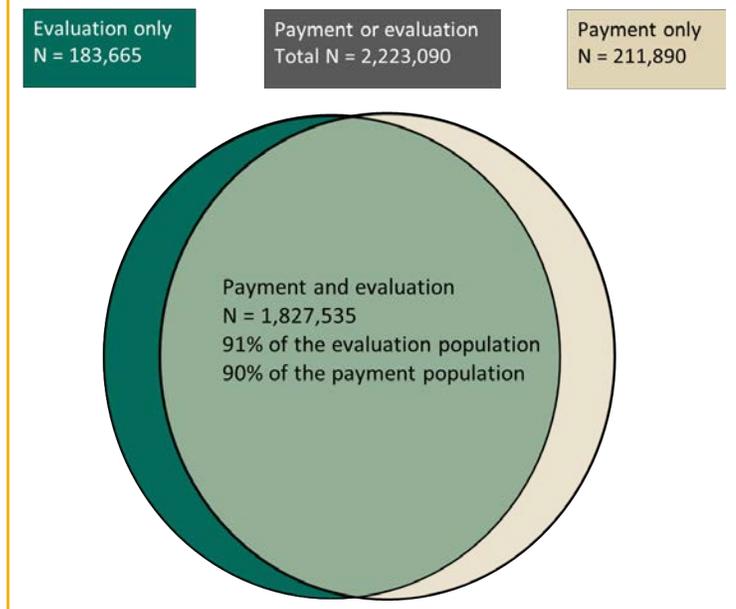
Q4 for Cohort 2). These groups were selected because the time periods used the same two-year lookback period for the respective claims-based attribution (October 1, 2018, to September 30, 2020, for Cohort 1 and October 1, 2019, to September 30, 2021, for Cohort 2). In this comparison, about 91 percent of beneficiaries in the evaluation population were attributed to PCF practices for payment, and about 90 percent of the payment population was attributed to PCF practices for the evaluation. Roughly 184,000 beneficiaries were attributed to PCF practices only by the evaluation, and about 212,000 beneficiaries were attributed to PCF practices only for payment.

For the evaluation, we are primarily concerned with the proportion of beneficiaries in the evaluation population who are also included in the payment population (that is, the 91 percent). Excluding 211,890 payment-attributed beneficiaries from the evaluation does not bias our estimates of model impacts, although it will somewhat reduce our statistical power to detect effects. In contrast, by including beneficiaries in the evaluation population for whom the practices do not receive payments, we might attenuate our impact estimates relative to PCF's true impact if the 183,665 affected beneficiaries are not all receiving the PCF intervention.

A.2.2. Methods to analyze practice participation in PCF

In this section, we summarize the methods and analysis samples used to analyze practice participation in PCF. We first describe the groups of primary care practices we study. Next, we outline the practice sample restrictions we make before conducting descriptive analyses. Lastly, we outline the analytic tools and measures used to characterize the practices.

Exhibit A.2.1.5. Overlap between beneficiaries attributed to PCF Cohort 1 and 2 practices for the evaluation and those attributed for payment



A. Identifying primary care practice groups of interest

We defined a primary care practice as a practice that had at least one physician with a primary care specialty (general practice, family medicine, internal medicine, or geriatric medicine) (see Appendix A.2.1 for details). All primary care practices were identified using OneKey data—a comprehensive national database of practitioners and their organizations—with practice name and address information. To study the characteristics of Medicare FFS beneficiaries across different practice groups, we linked beneficiaries to primary care practices based on the practice to which they were attributed in the first quarter of 2020.

In our descriptive analyses of practice characteristics, we studied the following groups of practices:

- **PCF practices.** A PCF practice is a primary care practice that joined Cohort 1 or Cohort 2 of the PCF model for at least one calendar quarter. We included PCF practices in our descriptive analyses even if they subsequently left the model. We identified PCF practices using CMS applications and OneKey data.
- **PCF practices, by risk group.** We studied the characteristics of PCF practices by the four risk groups using the risk group they were assigned when they started the PCF model (January 1, 2021, for Cohort 1 and January 1, 2022, for Cohort 2).
- **CPC+ participants versus non-participants.** We identified practices that participated in CPC+ using CMS Master Data Management (MDM) data. We considered CPC+ participants to be those practices that participated for at least one quarter of CPC+.
- **Withdrawn practices.** We studied the descriptive characteristics of PCF practices that remained active in the model as of January 1, 2023, and compared them with those that withdrew before January 1, 2023. We do not consider a practice that merged with other PCF practices as a withdrawn practice because its practitioners are still participating in the model.
- **Non-participating primary care practices in PCF regions.** We studied the characteristics of two groups of non-participating primary care practices within PCF regions: (1) practices that applied to PCF but did not participate and (2) practices that did not apply to PCF. We identified practices that applied to PCF using PCF application data. In Appendix B.2, we further stratify the descriptive characteristics of non-participating applicants by those that were deemed ineligible versus those that voluntarily declined.
- **Non-participating primary care practices in non-PCF regions.** We identified primary care practices outside of PCF regions using the practices' location information in OneKey (see Appendix B.2 for a complete list of PCF regions).

B. Analytic sample and practice exclusions

We analyzed a total of 2,967 PCF practices: 822 Cohort 1 practices and 2,145 Cohort 2 practices. Exhibit A.2.2.1 provides a list of the practice inclusion criteria and the sample size at each step of the required inclusion criterion. We excluded all practices that did not have any assigned Medicare beneficiaries, many of which were FQHCs and RHCs, and practices that did not have any primary care practitioners. In addition, we removed practices with missing OneKey data (for example, new practices that did not exist in 2020).

Exhibit A.2.2.1. Practice inclusions and sample sizes

Inclusion	Practices by region		Participating PCF practices			Non-participating practices in PCF regions	
	PCF region	Non-PCF region	PCF practices	Cohort 1	Cohort 2	Applicants	Non-applicants
Total practice-year combinations in OneKey	83,891	88,039	3,066	845	2,221	2,714	78,113
Inclusion criteria							
Practice exists in 2020	78,945	82,863	3,043	845	2,198	2,682	73,222
Keep if OneKey year is 2020 (that is, remove other years for an individual practice)	38,561	38,716	3,043	845	2,198	1,342	34,178
Practice has non-zero assigned Medicare FFS beneficiaries in baseline period	27,259	28,290	2,972	826	2,146	895	23,394
Practice has at least one primary care practitioner	27,085	28,117	2,969	824	2,145	893	23,225
Practice has non-missing OneKey information	27,085	28,116	2,969	824	2,145	893	23,225
Total practices analyzed ^a	27,085	28,114	2,967	822	2,145	893	23,225

Notes: Mathematica's analysis of OneKey and Medicare claims data.

^a We excluded two practices located in non-PCF regions that participated in PCF (these were practices that had participated in Independence at Home).

FFS = fee for service.

C. Analysis of practice characteristics

We focused on three types of practice characteristics:

- 1. Characteristics of the practice itself.** Examples include the number of practitioners and practice system affiliation.
- 4. Characteristics of the community in which the practice's beneficiaries reside.** Examples include median household income in the Public Use Microdata Areas (PUMA), poverty rate in the PUMA, and the Social Vulnerability Index (SVI) in the county.
- 5. Characteristics of the beneficiaries assigned to the practice.** Examples include demographic information, chronic conditions, and Medicare FFS expenditures and service utilization.

A description of the characteristics we studied and their data sources are available in Appendix A.2.5.

We measured all characteristics before the start of PCF to capture differences that are not caused by the model itself. For both cohorts, we used 2020 data whenever possible to establish uniformity across

measures, including all beneficiary characteristics. The exception was practice-specific characteristics, such as the count of primary care practitioners, where we used 2020 data for Cohort 1 and non-participating practices (but 2021 for Cohort 2 practices). In addition, a few community characteristics such as the SVI were not available in 2020, so, for all practices, we used the most recent point in time those data were available before 2020.

In analyzing characteristics across practice groups, we calculated the mean values for continuous variables (such as Medicare FFS expenditures) and the proportions in each category for categorical variables (such as counts of practitioners). We weighted practices by the number of assigned Medicare FFS beneficiaries in 2020 for all statistics related to the practices' beneficiaries or their residences.

A.2.3. Payment calibration analysis

In this section, we describe how we obtained the payment comparison results presented in Chapter 3. The goal of this analysis was to compare the total payments that PCF practices received under the model with reimbursements under standard Medicare FFS. To this end, we calculated how much each PCF practice would have received under the physician fee schedule for services had it not participated in the model. Specifically, we calculated how much each PCF practice would earn for a given set of services delivered if CMS reimbursed those services under the standard Medicare FFS physician fee schedule, and we compared that hypothetical payment with the payment amount each practice would receive for delivering the same set of services under the PCF model.

When comparing payments under the PCF model with how much a practice would have earned under the physician fee schedule, we opted to use the set of services provided before the implementation of PCF. It is likely that the new PCF payment structure could lead to changes in the number and types of services provided. For example, PCF practices might have more face-to-face visits but fewer intensive services during each visit than they would if they were being paid under the physician fee schedule. To avoid these behavioral changes, we instead used services that PCF practices provided to their attributed beneficiaries during a pre-implementation baseline year (but reflecting the post-implementation year's physician fee schedule payment rates for those services). Specifically, we used services provided in 2019 (that is, before the COVID-19 public health emergency) and priced them using the 2022 physician fee schedule. For this annual report, we only included Cohort 2 practices (see the First Annual Report for the equivalent Cohort 1 comparison). We also show detailed results by practice risk group below.

Construction of the practice-level analytical file for the payment comparison analysis proceeded as follows:

1. We pulled 2019 carrier claims for Medicare FFS beneficiaries attributed to a Cohort 2 PCF practice in 2019. We used the attribution algorithm described in Appendix A.2.1 to identify these beneficiaries and disregarded denied claims. Because PCF payments are determined quarterly, we conducted the steps below separately for each quarter of 2019.
2. Practices receive \$40.82 for each visit that falls under the FVF, with adjustments described in steps 6 and 7. In the carrier claims, we identified procedures with the following characteristics that match the model's payment methodology: the PCF practice would have received an FVF (that is, claim line records that have a Healthcare Common Procedure Coding System [HCPCS] code of 99201–99205,

99211–99215, 99324–99328, 99334–99337, 99341–99345, 99347–99350, 99354, 99355, 99415, 99416, 99495–99498, G0402, G0438, or G0439 evaluation and management [E&M] services);^{36,37} the performing provider number was on the provider roster for the practice to which the beneficiary was attributed; and the procedure is the first one on a given day. In addition, we identified procedures that satisfied these conditions but were not the first on a given day. Although the latter category of procedures is not reimbursed under PCF (practices receive at most one FVF per beneficiary per day), practices would have received payment for multiple procedures per day under Medicare FFS.

3. We also identified chronic care management–related services, which have an HCPCS code of 99339, 99340, 99487, 99489, 99491, G2211, or G2212, and a performing provider number belonging to a provider on the provider roster for the practice to which the beneficiary was attributed.³⁸ PCF practices are prohibited from billing chronic care management–related services but would be reimbursed for these services under Medicare FFS.
4. We then assigned a physician fee schedule payment to all procedures identified in steps 2 (regardless of how many services the practice provided on a given day) and 3. We used the most recent version of the 2022 physician fee schedule to assign payments.³⁹ These payments depend on the HCPCS code and locality of the provider (geographic adjustment), so we merged physician fee schedule payment data with claims data based on HCPCS codes and the provider’s zip code.⁴⁰ In addition, physician fee schedule payments depend on the place of service. If the place of service is 19–26, 31–34, 50–58, 61, 62, 65, 71, or 72, the facility practice expense payment applies.⁴¹ Otherwise, the non-facility practice expense payment applies. Physician fee schedule payments are 10 percent higher for services delivered in Health Professional Shortage Areas. We identified Health Professional Shortage Area claims through provider zip code, the modifier AQ, or a specific Health Professional Shortage Area code of 1, 3, 5, or 7 on the claim line.⁴² Finally, physician fee schedule payments are reduced by 15 percent if a nurse practitioner (provider specialty code 50), certified clinical nurse specialist (89), or physician assistant (97) provides the service instead of a physician.

³⁶ See Table 3-1 in PCF Payment and Attribution Methodologies PY 2022, Version II, December 2021.

³⁷ HCPCS code 99201 was removed in 2021, so we treated claim lines with the code 99201 as if the provider had billed a code of 99202.

³⁸ HCPCS code G2212 became effective in 2021, so we did not observe it in 2019 claims.

³⁹ Physician fee schedule data are available at <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-National-Payment-Amount-File>.

⁴⁰ The zip code to locality crosswalk is available at <https://www.cms.gov/files/zip/2021-end-year-zip-code-file-revised-05272022.zip>.

⁴¹ The place of service codes for facility payments correspond to Off Campus-Outpatient Hospital, Urgent Care Facility, Inpatient Hospital, On Campus-Outpatient Hospital, Emergency Room – Hospital, Ambulatory Surgical Center, Birthing Center, Military Treatment Facility, Skilled Nursing Facility, Nursing Facility, Custodial Care Facility, Hospice, Federally Qualified Health Center, Inpatient Psychiatric Facility, Psychiatric Facility-Partial Hospitalization, Community Mental Health Center, Intermediate Care Facility/ Individuals with Intellectual Disabilities, Residential Substance Abuse Treatment Facility, Psychiatric Residential Treatment Center, Non-residential Substance Abuse Treatment Facility, Non-residential Opioid Treatment Facility, Comprehensive Inpatient Rehabilitation Facility, Comprehensive Outpatient Rehabilitation Facility, End-Stage Renal Disease Treatment Facility, Public Health Clinic, Rural Health Clinic (https://www.cms.gov/Medicare/Coding/place-of-service-codes/Place_of_Service_Code_Set).

⁴² The list of Health Professional Shortage Areas is available at https://data.hrsa.gov/DataDownload/DD_Files/BCD_HPSA_FCT_DET_PC.csv. We used crosswalks from census tract, county subdivision, and county to zip code, available at [DATASETS | HUD USER](#), to match provider zip codes with Health Professional Shortage Areas.

5. We calculated the coinsurance amount practices would receive under PCF as 20 percent of the physician fee schedule payment for E&M and chronic care management–related services calculated in step 4.
6. We adjusted the physician fee schedule payments and the FVF payments to account for sequestration in 2022:
7. We adjusted the physician fee schedule payments and the FVF payments to account for sequestration in 2022:
 - a. There is no adjustment needed for 2022 Q1.
 - b. In 2022 Q2, we multiply the payment by 0.99.
 - c. In 2022 Q3 and Q4, we multiply the payment by 0.98.
8. We applied Merit-based Incentive Payment System (MIPS) adjustments to physician fee schedule payment amounts and to FVFs as follows:
 - a. We identified claim lines with positive or negative MIPS adjustments as indicated by a Line Other Applied Indicator Code of V or W and took the corresponding Line Other Applied Amount.
 - b. We subtracted this amount from the line payment amount if the MIPS adjustment was positive and added it if the adjustment was negative to obtain a MIPS-adjusted payment.
 - c. We calculated a MIPS adjustment factor by dividing the MIPS-adjusted payment by the original line payment amount. This adjustment factor is less than 1 for positive MIPS adjustments and more than 1 for negative MIPS adjustment.
 - d. We applied the MIPS adjustment factor based on 2019 claims to the 2022 physician fee schedule payment amounts by dividing the payment amount by the adjustment factor. This adjustment increases or lowers physician fee schedule payments according to practice’s 2019 MIPS adjustments.
 - e. We applied the same MIPS adjustment to the FVF that practices receive under PCF.

Although PCF practices will not receive MIPS adjustments if they qualify as advanced alternative payment model (APM) participants in future years of the PCF Model, the MIPS adjustments do apply for the first model year. CPC+ participants exempt from MIPS in 2020 because of participation in that model would receive no MIPS adjustment in 2022, their first year of PCF. If they qualified as advanced APM participants throughout the CPC+ model, however, they should also have received no MIPS adjustment to their 2019 claims, because MIPS adjustments roughly cancel out to 0 across PCF practices, on average, they are unlikely to meaningfully change our findings.

9. We geographically adjusted FVF amounts by multiplying them by the Geographic Adjustment Factor applicable for the county where the practice is located. We determine the Geographic Adjustment Factor as follows: Geographic Adjustment Factor =

$$0.50866 \times GPCI_{PW} + 0.44839 \times GPCI_{PE} + 0.04295 \times GPCI_{MP}, \text{ where } GPCI_{PW}, GPCI_{PE}, \text{ and}$$

$GPCI_{MP}$ are the Geographic Practice Cost Indices for physician work, practice expenses, and

malpractice insurance. We used the Geographic Practice Cost Indices from the 2022 physician fee schedule.⁴³

10. The payment accuracy adjustment factors into the payment calculation by filtering out services that are provided by a provider that is not on the roster of the practice to which the beneficiary was attributed. We identified procedures that are used to adjust payments. These are carrier claim line items with a HCPCS code of 99201–99205, 99211–99215, 99324–99328, 99334–99337, 99339–99345, 99347–99350, 99495–99497, G0402, G0438, or G0439 when the provider’s taxonomy code is 207Q00000X, 207QA0505X, 207QG0300X, 207QH0002X, 208D00000X, 207R00000X, 207RG0300X, 207RH0002X, 364S00000X, 364SA2100X, 364SA2200X, 364SC2300X, 364SC1501X, 364SF0001X, 364SG0600X, 364SH1100X, 364SW0102X, 363L00000X, 363LA2200X, 363LC1500X, 363LF0000X, 363LG0600X, or 363LP2300X; or with 99487, 99490, or 99491 when the provider has any taxonomy code (see Exhibit A.2.1.2. for a list of CPT codes and primary care services and Exhibit A.2.1.3. for a list of taxonomy codes and primary care specialties). In addition, the place of service has to be 02, 05–08, 10–20, 22, 33, 49, 50, 53, 60, 71, 72, or 99.⁴⁴
11. We rolled up the claim line data to the practice level by taking, for each practice, the sum of each of the following quantities appearing on the practice’s claims: (1) the physician fee schedule payments practices would have received for E&M and chronic care management–related services (sequestration and MIPS adjusted), (2) FVF payments (sequestration, MIPS, and geographically adjusted), (3) coinsurance payments, and (4) the number and payments of services beneficiaries received from the practice to which they were attributed and from other providers (for payment accuracy adjustment).
12. We calculated quarterly PBPs as the number of attributed beneficiaries times \$84 (for practices in risk group 1), \$135 (risk group 2), \$300 (risk group 3), or \$525 (risk group 4). We applied the geographic adjustment described in step 7 to these PBPs.
13. We calculated practice-level payment accuracy adjustments for each quarter by calculating the payment accuracy ratio (number of payment accuracy adjustment–eligible services attributed beneficiaries received outside the practice divided by total number of payment accuracy adjustment–eligible services) in the same quarter and calculated payment accuracy–adjusted PBP by multiplying total PBP by (1 – payment accuracy ratio).
14. We expressed all payments in dollars per beneficiary per month by dividing the quarterly payments by three times the number of attributed beneficiaries per practice.
15. We calculated weighted means for practice-level payments per beneficiary per month when we used the number of attributed beneficiaries as weights and combined payments from all four quarters. Under PCF, we considered PBP (with and without payment accuracy adjustment), FVF, and coinsurance payments. Under Medicare FFS, we considered payments based on the 2022 physician fee schedule, which consist of Medicare Part B payments and coinsurance (Exhibit 3.7 in Chapter 3).

⁴³ The Geographic Adjustment Factors are available at <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/Downloads/CountyGPCIsandGAFsMasterFile.zip>.

⁴⁴ See Table 2 to 4 and Appendices B and I in PCF Payment and Attribution Methodologies PY 2022, Version II, December 2021. The provider taxonomy codes refer to primary care specialties including nurse practitioners (except for acute care and women’s health nurse practitioners) and excluding physician assistants. The place of service codes refer to places where primary care services are usually provided, such as office, home, urgent care facility, and Federally Qualified Health Center.

We also considered the distribution of total payments under PCF and Medicare FFS separately for each risk group and displayed the distributions as box-and-whisker plots (Exhibit 3.8 in Chapter 3). In these plots, the boxes indicate the 25th percentile, median, and 75th percentile, and the whiskers indicate upper and lower adjacent values. The upper and lower adjacent values are defined as the observed payment amount closest to and at most as large as $x_{[75]} + 2 / 3(x_{[75]} - x_{[25]})$ (upper) or $x_{[25]} - 2 / 3(x_{[75]} - x_{[25]})$ (lower), where $x_{[25]}$ and $x_{[75]}$ are the 25th and 75th percentiles.

A.2.4. Constructing claims-based measures

In this section, we detail the measures used in this report that are based on Medicare claims and enrollment information. There are four main categories of measures: (1) beneficiary characteristics and health status, (2) primary outcomes (that is, expenditures and service utilization), (3) secondary outcomes (that is, potentially avoidable utilization), and (4) leading indicators. We generally report the service utilization measures as the annualized rate per 1,000 beneficiaries and expenditures as per beneficiary per month. The latter is the expenditures for the months a beneficiary was eligible for Medicare FFS during the year divided by the number of months the beneficiary was eligible for Medicare FFS.

A. Beneficiaries' characteristics and health status

Beneficiaries' demographics (age, race, and gender), original reason for Medicare eligibility (age, disability, or ESRD), and current reason for Medicare eligibility are based on information in the Medicare enrollment database. We calculated beneficiaries' age as of January 1, 2021, for Cohort 1 and January 1, 2022, for Cohort 2.

Dual-eligibility status, Part D enrollment, and Part D low-income subsidy eligibility come from information obtained from the Master Beneficiary Summary File from December 2020. We flagged a beneficiary as dually eligible for Medicare and Medicaid if they had full or partial dual-eligibility status during the month.

Hierarchical Condition Category (HCC) scores

We calculated HCC scores using CMS' HCC 2021 score software and algorithm based on information from Medicare claims and enrollment data from baseline years, and we adapted CMS' algorithm for the purpose of the impact analysis. Specifically, we used the following approach:

1. To calculate the HCC score, we used a 12-month lookback for Medicare claims to obtain diagnosis information. For example, to calculate the 2021 HCC score, we used Medicare claims in 2020.
2. The HCC algorithm also uses information on demographics, reason for Medicare eligibility, new enrollee status, dual-eligibility status (with the latest version of the model distinguishing between beneficiaries who have full versus partial dual-eligibility status), long-term nursing home care, kidney transplant, and dialysis status. To estimate and assign HCC scores for any year, we used information on these attributes from the prior year. For example, to calculate the 2021 HCC score, we used the following beneficiary information:

- Demographics from 2020
 - Medicare eligibility (eligible because of age or disability) from 2020
 - New enrollee status from 2020 (we flagged a beneficiary with less than five months of Medicare FFS enrollment during the year as a new enrollee)
 - Dual-eligibility status (full, partial, or nondual) during the any of the last three months of 2020
 - ESRD status during the last three months of 2020
 - Long-term institutionalization status during a 120-day period ending on December 31, 2020
 - The number of months since a kidney transplant, looking back from January 1, 2021
 - Whether the transplant was successful or the beneficiary was on dialysis as of the end of 2020
- 3.** The HCC algorithm estimates the following separate models reflecting different levels of health status: (1) ESRD (further differentiating by dialysis status and time since functioning kidney transplant), (2) long-term institutionalization, (3) community (further differentiating by dual status and aged versus disabled reason for Medicare entitlement), and (4) new enrollee. These models include different covariates and interaction terms and therefore lead to multiple values of the HCC scores for each beneficiary. We assign the beneficiary the score from the model reflecting the highest level of morbidity, following CMS' approach. For example, a beneficiary who has ESRD and is institutionalized would be assigned the score from the ESRD model. As part of this step, we multiply HCC scores for beneficiaries (1) with ESRD and on maintenance dialysis or (2) with a functioning kidney transplant by a CMS-published scaling factor that reflects the higher average medical costs of these two beneficiary groups compared with the average Medicare FFS population.
 - 4.** Finally, we normalize the HCC scores by dividing each individual HCC score calculated in step 3 by the mean of calculated HCC scores for all treatment and comparison beneficiaries in that year and PCF cohort. The normalization factor compensates for changes in coding practice and population demographics between different years of the baseline period by centering the average HCC score at 1.0 in each year for our population of treatment and comparison beneficiaries.

We derive the number of HCC categories and measures of chronic conditions, except for measures of hyperlipidemia and hypertension, from the individual variables generated by the HCC software as part of the construction of the HCC score.

Measures of hyperlipidemia and hypertension are based on the Chronic Condition Algorithm. The HCC algorithm does not include individual measures for these conditions. Because of the prevalence of these conditions in the Medicare population, however, we include them in our evaluation. The Chronic Condition Algorithm looks for (1) at least one qualifying diagnosis code on inpatient, skilled nursing facility, or home health claims or (2) at least two claims in the Hospital Outpatient or Carrier files with a qualifying diagnosis (CMS n.d.).

B. Primary outcomes

Total Medicare Part A and B expenditures

This measure reflects Medicare expenditures for services covered by Part A and Part B and includes Medicare payments for inpatient, outpatient, and physician and non-physician services as well as skilled nursing facilities, home health, hospice services, and durable medical equipment (DME) services. Medicare Part A and B expenditures also include QPP payments and exclude third-party and beneficiary liability payments. We do not include Part D expenditures because Medicare makes prospective payments to Part D prescription drug plans that are not directly related to each individual prescription filled by a beneficiary. Here, we detail the other components included in our total expenditure measure.

From 2019 to 2022, QPP payments included claims-based adjustments for the MIPS that are negative or positive adjustments to physician fees, Critical Access Hospital (CAH) claims, and advanced APM incentive payments based on performance two years prior. The MIPS adjustments are included in the payment amount in the 2019–2022 Medicare claims for performance in 2017, 2018, 2019, and 2020, respectively. APM incentive payments are NPI-level payments paid directly to eligible practitioners. We use an NPI-level payment file we received from CMS and a list of NPIs affiliated with each practice. For Track 2 CPC+ practices, CMS also provided alternative capitated payments, in the form of Comprehensive Primary Care Payments (CPCPs), which shifted a portion of the payments practices receive for services from FFS to prospective payments. Because these are payments for services, they are included in the Medicare expenditure measures.

Our goal is to estimate impacts for Medicare expenditures for FFS beneficiaries, so we do not include enhanced payments from other (non-Medicare) payers in our calculations. Enhanced payments are made *in addition to traditional payments for services and the QPP payments described in the previous paragraph*. Medicare enhanced payments include CMS' PBPs, which are monthly per-beneficiary payments paid directly to practices for Medicare FFS beneficiaries. PBAs are also applied beginning in the second performance year; they are quarterly positive or negative adjustments applied directly to the practices. Starting in Performance Year 2, 101 practices left and enrolled in ACO Reach. We continue to follow these practices, so we also incorporate the ACO model payments into our total expenditure calculations.

Acute hospitalizations

This measure includes short-stay acute inpatient and CAH facility stays. Transfers between facilities count as a single admission. Multiple claims representing transfers between hospitals are combined into a single record so that they count as one hospitalization. We categorized an inpatient stay as a short-stay acute inpatient hospital stay when the third to sixth digits of the provider number are equal to 0001 through 0899. If the third and fourth digits of the provider number are equal to 13, then it is a CAH stay.

C. Secondary outcomes

Unplanned readmissions

We calculate unplanned readmissions as the proportion of eligible acute inpatient discharges (index discharge) that were followed by an unplanned hospitalization within 30 days of the discharge. Our

definition of this measure is based on the Yale readmission measure developed by the Yale New Haven Health Services Corporation/Center for Outcomes Research & Evaluation (YNHHSC/CORE 2021) that is used in the Hospital Readmission Reduction Program under Section 3025 of the Affordable Care Act (QualityNet 2023). An unplanned readmission is as any acute hospitalization that does not continue care (examples of planned admissions include recurring admissions for chemotherapy and planned admission for transplant surgery). For an index discharge to qualify for inclusion in the readmission measure, the beneficiary must (1) be enrolled in Medicare FFS Part A and not in a health maintenance organization (HMO) at the time of the index admission, (2) be enrolled in Medicare FFS Part A during the month following discharge, (3) be alive at discharge, and (4) not be discharged against medical advice. In addition, certain inpatient stays were excluded from the universe of index discharges, including discharges with lengths of stay longer than one year; stays at cancer hospitals exempt from the prospective payment system; and stays for psychiatric conditions, rehabilitation, cancer, or COVID-19.

Readmissions after eligible acute inpatient discharges excluded planned readmissions. All qualifying hospital discharges with an unplanned readmission within 30 days were identified as having an unplanned readmission. Therefore, the measure provided an estimate of the proportion of acute hospital discharges with an unplanned readmission within 30 days.

Primary-care-substitutable ED visits

Primary-care-substitutable ED visits are a subset of outpatient ED visits and observation stays, identified in the outpatient file using revenue center codes 045X or 0981 (emergency room care), or 0760 or 0762 (treatment or observation room). We exclude claims with only laboratory or imaging services by removing all claims lines in which HCPCS procedure codes were 70000 to 79999 or 80000 to 89999. We further excluded claims leading to an inpatient admission.

We then identified a subset of these outpatient ED visits as potentially primary care substitutable using the New York Emergency Department Algorithm (NYU-EDA) (Billings et al. 2000) updated with the patch developed by Johnston et al. (2017). This algorithm classifies ED visits into one of four categories based on the primary diagnosis code from the claim: (1) nonemergent, (2) emergent but treatable in a primary care setting, (3) emergent with ED care required but preventable or avoidable if appropriate ambulatory care had been received, and (4) emergent with ED care required and not preventable or avoidable. We then define a primary care substitutable ED visit as belonging to either of the first two categories (that is, a nonemergent ED visit or an emergent ED visit treatable in a primary care setting). If a beneficiary had multiple ED visits on a given service date, we counted only the first claim in the file.

Potentially preventable ED visits

We classify a subset of outpatient ED visits as potentially preventable using the publicly available 2022 version of Quality Indicator (QI) software from the Agency for Healthcare Research and Quality (AHRQ). This software flags claims with Prevention Quality Indicators (PQIs) and Inpatient Quality Indicators (IQIs), which identify inpatient or ED encounters that could have been avoided through access to high-quality primary care from diagnosis and procedure codes. We defined potentially preventable ED visits as outpatient ED visits flagged with any of these quality indicators (Exhibit A.2.4.1).

Exhibit A.2.4.1. PQI and IQI flags for potentially preventable ED visits

PQI/IQI	Principal diagnosis
Diabetes related	
PQI #01	Diabetes with short-term complications
PQI #03	Diabetes with long-term complications
PQI #14	Uncontrolled diabetes
PQI #16	Lower-extremity amputation among patients with diabetes
Congestive heart failure	
PQI #08	Congestive Heart Failure
COPD	
PQI #05	COPD or asthma in older adults
Coronary artery disease	
PQI #07	Hypertension
IQI #15	Acute myocardial infarction
IQI #17	Stroke
Non-disease specific	
PQI #11	Community-acquired pneumonia
PQI #12	Urinary tract infection

COPD = chronic obstructive pulmonary disease; ED = emergency department; IQI = Inpatient Quality Indicator; PQI = Prevention Quality Indicator.

We used the AHRQ definitions to identify ED visits with principal diagnoses of stroke or acute myocardial infarction for IQI #15 and IQI #17, but we did not calculate mortality rates among these beneficiaries.

D. Leading indicators*Transitional care management*

We identified transitional care management services from claim lines in the carrier and outpatient files with an HCPCS code of 99495 or 99496 (Transitional care management services with moderate or high medical decision complexity, respectively).

Follow-up care after hospitalizations, ED visits or observation stays

We use this measure to identify acute hospitalizations, ED visits, or observation stays followed by an E&M visit with a primary care provider or specialist within seven days after discharge. We exclude hospitalizations, ED visits or observation stays that (1) ended with a patient's death or discharge against medical advice; (2) occurred for cancer treatment, psychiatric conditions, or rehabilitation, since these procedures are often specific to unique treatment facilities that are not comparable to acute care hospitals; or (3) terminated in a transfer to another institutional provider. We additionally exclude hospitalizations lasting longer than one year. We then define discharges as having follow-up care if the beneficiary had a primary care or specialist E&M visit in any setting up to 7 days after the discharge date. We exclude visits with behavioral health specialists from our definition of follow-up care.

Medication adherence for multiple chronic conditions

We report this measure (which is based on Farley et al. 2019) for beneficiaries with filled prescriptions for medications in three or more distinct diagnostic categories. We first separately determine the proportion of days covered (PDC) for 29 target medication classes under seven diagnostic categories using specifications and value sets from the Pharmacy Quality Alliance (PQA) for PDC in 2023. We limit the denominator for this measure to beneficiaries age 18 or older with continuous Medicare FFS enrollment for Part A, B, and D for the entire year. Beneficiaries must also have at least one dispensing event in the Part D file for an eligible medication in at least three distinct diagnostic categories (Exhibit A.2.4.2). Beneficiaries are excluded from the denominator of specific medication classes if they (1) have ESRD, (2) received hospice care in the year, (3) filled a prescription for insulin, (4) filled a prescription for sacubitril/valsartan (Entresto), or (5) were hospitalized for a psychiatric condition in the year.

Exhibit A.2.4.2. Diagnostic categories, medication classes, and exclusion criteria

Diagnostic category	Medication class	Exclusions
Diabetes	<ul style="list-style-type: none"> • Biguanides • Sulfonylureas • Thiazolidinediones • DPP-4 inhibitors • Meglitinides • SGLT2 Inhibitors • GLP-1 Receptor Agonists • Alpha-Glucosidase inhibitors 	<ul style="list-style-type: none"> • ESRD • Hospice care • Prescription for insulin
Hypertension	<ul style="list-style-type: none"> • ACE Inhibitor • Direct Renin Inhibitor • Angiotensin II Receptor Blocks (ARB) • Beta-blockers • Calcium channel blockers • Alpha-Beta Blockers • Selective aldosterone receptive antagonists 	<ul style="list-style-type: none"> • ESRD • Hospice care • Prescription for sacubitril/valsartan
Hyperlipidemia	<ul style="list-style-type: none"> • Antihyperlipidemics (including statins) • Antihyperlipidemics – bile acid sequestrants 	<ul style="list-style-type: none"> • ESRD • Hospice care
Asthma	<ul style="list-style-type: none"> • Inhaled Corticosteroids • Leukotriene Inhibitors 	<ul style="list-style-type: none"> • Hospice care
Depression	<ul style="list-style-type: none"> • Other Antidepressants • Serotonin-norepinephrine reuptake inhibitors (SNRIs) • Monoamine Oxidase Inhibitors (MAOIs) • Selective Serotonin Reuptake Inhibitors (SSRIs) 	<ul style="list-style-type: none"> • Psychiatric hospitalization

Diagnostic category	Medication class	Exclusions
Other mental health condition	<ul style="list-style-type: none"> • Antipsychotic – first and second generation • Antimanic agents • Antiparkinson’s agents • Epilepsy medications 	<ul style="list-style-type: none"> • Psychiatric hospitalization

We then calculate the number of eligible days for each diagnostic category as the number of days from the first dispensing event to the end of the measurement year. We also calculate the number of days’ supply for medications in each diagnostic category from all the dispensing events identified in the Part D prescription drug event data during the measurement year. We allow different medication classes from the same diagnostic category to count toward the number of days’ supply for that category. Finally, we divide the number of days’ supply by the number of eligible days to determine the proportion of days covered. If the proportion of days covered is greater than 0.80 for at least three diagnostic categories, the beneficiary is considered medication-adherent for multiple chronic conditions.

High-risk medication use in the elderly

We created this measure based on the 2022 specifications of the Healthcare Effectiveness Data and Information Set (HEDIS) High Risk Medications in the Elderly measure. We restrict the denominator to beneficiaries who were at least age 65 at the end of the measurement year and continuously enrolled in Medicare Part A, B, and D for the entire year. We also exclude beneficiaries who used hospice services at any time in the measurement year. We identify prescriptions filled for three classes of drugs in the Part D prescription drug event data: (1) high-risk medications with any dose or duration, (2) high-risk medications crossing a specified threshold for days’ supply, and (3) high-risk medications crossing an average daily dose threshold (Exhibit A.2.4.3). We classify beneficiaries as having high-risk medication use if they filled two or more prescriptions for medications with a high-risk designation in the same class within the measurement year.

Exhibit A.2.4.3. High-risk medication drug classes

Medication classes
High-risk medications at any dose or duration
Anticholinergics, first-generation antihistamines
Anticholinergics, anti-Parkinson agents
Antispasmodics
Antithrombotics
Cardiovascular, alpha agonists, central
Cardiovascular, other
Central nervous system, antidepressants
Central nervous system, barbiturates
Central nervous system, vasodilators
Central nervous system, other
Endocrine system, estrogens with or without progestins; includes only oral and topical patch products

Medication classes

Endocrine system, sulfonyleureas, long-duration

Endocrine system, other

Pain medications, skeletal muscle relaxants

Pain medications, other

High-risk medications if exceeding days' supply threshold

Anti-infectives, other

Nonbenzodiazepine hypnotics

High-risk medications if exceeding average daily dose threshold

Reserpine

Digoxin

Doxepin

Telehealth use

We identified a subset of ambulatory visits as non-face-to-face using three selection criteria:

- Visit procedure codes such as telephone and online E&M, telephone and online assessment and management, chronic care remote patient monitoring, and virtual check-ins
- Visits with a modifier value of 95, GT, GQ, or G0 indicating a telehealth visit or 93 (audio only)
- Visits identified on the carrier file that have the place of service equal to 02 (telehealth provided other than in a patient's home) or 10 (telehealth provided in a patient's home)

Urgent care visits

We identify urgent care center (UCC) visits from carrier claims with a place of service code of 20 and from claim lines in the outpatient file with a revenue code of 516 or 526. If there are multiple UCC visits with the same date of service, we count only the first UCC claim to appear in the file.

Observation stays

We define observation stays as ED visits that do not result in an inpatient stay, with eight or more billed hours of hospital observation services. We start from our overall measure of ED visits and observation stays, described in the primary-care-substitutable ED visit measure. We then identify a subset of these visits as observation stays if they have eight or more claim lines with a HCPCS procedure code of G0378 (hospital observation services per hour).

Behavioral health visits to behavioral health specialists in an ambulatory setting

We classify an encounter as a behavioral health visit in an ambulatory setting if it meets the criteria in one of the three scenarios:

1. Behavioral health visit in an office (a must be true and either b or c must be true):
 - a. A claim is in the carrier file and has a behavioral health procedure code in an ambulatory setting listed in Exhibit A.2.4.4
 - b. The performing provider has a behavioral health taxonomy code that is in Exhibit A.2.4.5

- c. If the NPPES taxonomy code is missing for the provider that appears in the Part B claim line file or if the performing provider field is missing in the Part B claim line, we use the HCFA specialty field in the Part B claim line (If HCFASPCL = 13, 14, 26, 27, 62, 68, 79, 80, 86, or C0, they are a behavioral health specialist)
- 6. Behavioral health visit in an FQHC or RHC (both a and b must be true):
 - a. A claim is in the Hospital Outpatient Hospital file where FQHCs/RHCs is defined through a combination of the facility type and type of service variables (FAC_TYPE=7 and TYPESRVC=1, 3, or 7) and has a revenue center code for FQHCs or RHCs (0521, 0522, 0527, or 0528), or HCPCS code G0512, or any of the HCPCS codes in Exhibit A.2.4.4 on any one of the claim lines
 - b. The rendering provider at the claim-line level has a behavioral health taxonomy code from Exhibit A.2.4.5 (If the rendering provider is missing in the outpatient hospital claim-line file, we use the attending operating and other provider fields)
- 7. Behavioral health visit in a critical access hospital (a, b, and c must be true):
 - a. A claim is in the Hospital Outpatient hospital file in which a CAH is defined through a combination of the provider field (last four digits of claim level field PROVIDER = 1300-1399), facility type (FAC_TYPE=8), and type of service (TYPESRVC=5)
 - b. The claim has revenue code 0961 or 0984 and a CPT/HCPCS code in Exhibit A.2.4.4 or G0463
 - c. The rendering provider at the claim-line level has a behavioral health taxonomy code from Exhibit A.2.4.5 (If the rendering provider is missing in the outpatient hospital claim-line file, we use the attending operating and other provider fields)

Exhibit A.2.4.4. CPT and HCPCS codes to identify behavioral health visits in ambulatory settings

CPT/HCPCS Codes	Description	CPT/HCPCS Codes	Description
90832–90839, 90845–90849, 90853	Psychotherapy	96136, 96138, 96146	Psychological or neuropsychological test administration
0364T, 0365T	Adaptive behavior treatment by protocol, administered by technician	96150–96155	Health and behavior assessment
90791–90792	Psychiatric diagnostic interview examination	97151–97152	Behavior Identification Supporting Assessment
90865	Narcosynthesis for psychiatric diagnostic and/or therapeutic purposes	97153–97158	Adaptive Behavior Treatment
90875–90876	Individual psychophysiological therapy incorporating biofeedback training by any modality (face-to-face with patient), with psychotherapy	94408–94409, G0396–G0397	Alcohol and/or substance (other than tobacco) abuse structured screening, and brief intervention services
90880	Medical hypnotherapy	G0409	Social work and psychological services, directly relating to and/or furthering the patient's rehabilitation goals
90899	Unlisted psychiatric service or procedure	G0443	Brief face-to-face behavioral counseling for alcohol misuse

Appendix A.2. Additional methodological details of processing and analyzing secondary data

CPT/HCPCS Codes	Description	CPT/HCPCS Codes	Description
96105	Assessment of Aphasia and Cognitive Performance Testing	G0445	High intensity behavioral counseling to prevent sexually transmitted infection
90870	Electroconvulsive therapy	G0446	Face-to-face intensive behavioral therapy for cardiovascular disease
96116	Neurobehavioral status exam	G0447, G0473	Face-to-face behavioral counseling for obesity
96125	Standardized cognitive performance testing	99406–99407	Smoking and tobacco use cessation counseling visit
96127	Brief emotional/behavioral assessment (e.g., depression inventory, attention-deficit/hyperactivity disorder scale)	99484	Care management services for behavioral health conditions
96130	Psychological testing evaluation services by physician or other qualified health care professional	99492–99494	Behavioral health care manager activities
96132	Neuropsychological testing evaluation services by physician or other qualified health care professional	G0502–G0504	Psychiatric collaborative care management
96156	Health behavior assessment or re-assessment – new in 2020	0360T	Observational behavioral follow-up assessment
96158, 96164, 96167, 96170	Health and behavior intervention	0702T, 0703T	Remote therapeutic monitoring of a standardized online digital cognitive behavioral therapy program
97129	Therapeutic interventions that focus on cognitive function	G2011	Alcohol and/or substance abuse structured assessment and brief intervention
G2076	Intake activities, including a physician assessment, - opioid treatment program	G2086–G2088	Office-based treatment for opioid use disorder

CPT = Current Procedural Terminology; HCPCS = Healthcare Common Procedure Coding System

Exhibit A.2.4.5. NPES behavioral health specialist taxonomy codes

Taxonomy code	Description	Taxonomy code	Description
102L00000X	Psychoanalyst	-	Psychiatry & Neurology
103T00000X	Psychologist	2084N0600X	Clinical Neurophysiology
103TA0400X	Addiction (Substance Use Disorder)	2084N0400X	Neurology
103TA0700X	Adult Development & Aging	2084N0402X	Neurology with Special Qualifications in Child Neurology
103TB0200X	Cognitive & Behavioral	207T00000X	Neurological Surgery
103TC1900X	Counseling	2084N0008X	Neuromuscular Medicine
103TE1000X	Educational	2084P0005X	Neurodevelopmental Disabilities
103TE1100X	Exercise & Sports	2084P0015X	Psychosomatic Medicine
103TF0000X	Family	2084P2900X	Pain Medicine

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Taxonomy code	Description	Taxonomy code	Description
103TF0200X	Forensic	2084S0010X	Sports Medicine
103TH0004X	Health	2084S0012X	Sleep Medicine
103TH0100X	Health Service	2084V0102X	Vascular Neurology
103TM1700X	Men & Masculinity	2084B0040X	Behavioral Neurology & Neuropsychiatry Specialty
103TM1800X	Mental Retardation & Developmental Disabilities	2084A2900X	Neurocritical Care
103TP0016X	Prescribing (Medical)	2084B0002X	Bariatric Medicine
103TP0814X	Psychoanalysis	2084P0301X	Brain Injury Medicine
103TP2700X	Psychotherapy	2084F0202X	Forensic Psychiatry
103TP2701X	Group Psychotherapy	2084H0002X	Hospice and Palliative
		2084P0800X	Psychiatry
103TR0400X	Rehabilitation	2084P0802X	Addiction Psychiatry
103TW0100X	Women	2084P0805X	Geriatric Psychiatry
103TC0700X	Clinical	2084B0040X	Behavioral Neurology & Neuropsychiatry Specialty
173F00000X	Sleep Specialist, PhD	2084D0003X	Diagnostic Neuroimaging
103TS0200X	School	2084A0401X	Addition Medicine
-	Therapist	-	Preventative Medicine
106H00000X	Marriage & Family Therapist	2083A0300X	Addiction Medicine
102X00000X	Poetry Therapist	-	Internal Medicine
222Q00000X	Developmental Therapist	207RA0401X	Addiction Medicine
225A00000X	Music Therapist	-	Family Medicine
225800000X	Recreation Therapist	207QS1201X	Sleep Medicine Specialization
225600000X	Dance Therapist	207QA0401X	Addition Medicine
221700000X	Art Therapist	-	Registered Nurse
225700000X	Massage Therapist	163WP0808X	Psychiatric/Mental Health
226000000X	Recreation Therapist	163WP0809X	Psychiatric/Mental Health, Adult
101Y00000X	Counselor	163WA0400X	Addiction (Substance Use Disorder)
101YM0800X	Mental Health	163WP0000X	Pain Management
101YA0400X	Substance Use Disorder/Addiction	-	Clinical Nurse Specialist
225C00000X	Rehabilitation Counselor	364SN0800X	Neuroscience
101YP1600X	Pastoral	364SP0808X	Psychiatric/Mental Health
101YP2500X	Professional	364SP0809X	Psychiatric/Mental Health, Adult
101YS0200X	School	364SP0811X	Psychiatric/Mental Health, Chronically Ill

Taxonomy code	Description	Taxonomy code	Description
-	Social Worker	364SP0812X	Psychiatric/Mental Health, Community
1041C0700X	Clinical	364SP0813X	Psychiatric/Mental Health, Geropsychiatric
1041S0200X	School	103G00000X	Clinical Neuropsychologist
-	Occupational Therapist	-	Nurse Practitioner
225XN1300X	Neurorehabilitation	363LP0808X	Psychiatric/Mental Health
225XM0800X	Mental Health Specialization		

Source: NPPES.

NPPES = National Plan and Provider Enumeration System.

A.2.5. Comparison Group Selection

This section describes the comparison group used to estimate impacts for Medicare beneficiaries at PCF practices in both cohorts. We selected a group of comparison practices that was as similar (or balanced) as possible to the PCF group in several practice, market, and beneficiary characteristics. This similarity helps support the parallel trends assumption underlying the difference-in-differences regression framework used to estimate PCF impacts, which says outcomes for PCF and comparison practices would follow the same trends in the absence of PCF. The assumption is necessary for our frequentist empirical strategy to produce an unbiased estimate of the effect of PCF (Appendix A.2.6).

In Exhibit A.2.5.1, we show the PCF practices included in the impact analysis (that is, the PCF practices that were not subject to any exclusion rules that we applied to get the best estimate of the impact of PCF) for which we selected our comparison group.

Exhibit A.2.5.1. The sample of PCF practices in the impact evaluation

	Cohort 1	Cohort 2	Overall
Full PCF sample	845	2,221	3,066
Exclusions before selecting the comparison group			
Not located in a PCF region (qualified for PCF through Independence at Home)	2	0	2
Glide path participation in PCF ^a	77	69	146
Rural Health Clinics ^b	0	1	1
Exclusions because of comparison group requirements			
No available valid comparison group within PCF region ^c	8	96	104
Resulting samples for comparison group selection			
Final ITT PCF practice sample	758	2,055	2,813
ITT PCF practice with assigned beneficiaries in the baseline (practices reflected in baseline diagnostics)	758	2,051	2,809

^a Practices with at least 100 attributed beneficiaries but fewer than 125 were allowed into PCF on a “glide path,” which refers to conditional acceptance to PCF pending updated beneficiary counts in the future. We did not include these practices in the impact evaluation because we did not think we could identify appropriate comparison practices for them; that is, we could not use baseline data to identify comparison practices that would grow to have more than 125 attributed beneficiaries in the future.

^b This includes any practices that were Rural Health Clinics in the two-year baseline period preceding PCF participation. CMS does not attribute beneficiaries to Rural Health Clinics, so we cannot identify a baseline population for them. This is the case for the single practice listed.

^c As described later in this appendix, some PCF practices had no available comparison practices in the state. This occurred when the propensity score of all available comparison practices was not within an acceptable range of the PCF practice's score.

ITT = intent-to-treat.

We selected our comparison group using a three-step process:

Step 1. Define the pool of eligible comparison practices

We defined practices eligible for the comparison group as primary care practice locations for which we observed full information in OneKey (a proprietary database of health care provider information) that are in the same *state* as a PCF practice.

We excluded the following practices from the pool of eligible comparisons because these practice types were not eligible to participate in PCF:

- FQHCs, RHCs, and concierge practices
- Participants in a no-overlap Innovation Center model: Direct Contracting, Accountable Health Communities, or Value in Opioid Use Disorder Treatment
- Practices with few Medicare FFS beneficiaries (no fewer than 60 assigned in data at the time of matching; see Appendix A.2.1)
- Practices with a low proportion of services billed for primary care (less than or equal to 40 percent)

We also excluded the following practices from the comparison pool to limit the risk that comparison practices might be affected by PCF:

- Practices that share a TIN with a PCF practice during the baseline period in data at the time of matching
- Practices that share an NPI with a PCF practice during the baseline period

Step 2. Select characteristics for practice-level matching

We determined the practice, market, and beneficiary characteristics we would require balance on for our comparison group before we did any matching. Exhibits A.2.5.2 and A.2.5.3 show the characteristics we selected.

Step 3. Match PCF practices to potential comparison practices

We created matched sets for PCF practices, which means we matched each PCF practice included in the impact evaluation (Exhibit A.2.5.1) with one or more comparison practices. Each PCF practice could have up to five matched comparison practices, and each comparison practice could have up to five matched PCF practices in cases in which no other comparison practice was available.

For each state and for each PCF cohort, we used optimal matching to select a comparison group with the smallest collective difference with the PCF group (Sekhon 2011). We measured differences between PCF practices and their matched comparisons by the combination of (1) a Mahalanobis distance (Rubin 1980), which represented the difference between practices in nine characteristics we determined as

having the highest priority, and (2) a measure of driving time, described below, between practices to encourage geographic proximity. Further, we allowed optimal matching to only select comparison practices that fell within a certain range of the PCF practice's propensity score, which is based on about 50 of the characteristics shown in Exhibits A.2.5.2 and A.2.5.3; a propensity score predicts participation in PCF based on the practices' characteristics (Rubin 1996). Finally, we reweighted the matched comparisons to account for (1) differences within matched sets in the number of comparison and PCF practices and (2) differences within states in the number of comparison and PCF beneficiaries.⁴⁵

There was one important limitation to this approach. We excluded 104 PCF practices from matching (and therefore the impact analyses) because there were no available comparison practices within range of their propensity score (we show these sample changes in Exhibit A.2.5.1).

After matching, we assessed balance on characteristics by examining the difference in the PCF and comparison groups' averages, weighted by each practice's assigned beneficiaries (these weights approximate the influence of each practice in our impact analysis). We show the balance results in Exhibits A.2.5.2 and A.2.5.3 for the first and second PCF cohort, respectively, as well as for CPC+ alumni and non-CPC+ alumni in Exhibits A.2.5.4 and A.2.5.5, respectively. We did not require PCF practices that participated in CPC+ to be matched only to comparison practices that participated in CPC+. We assessed the mean travel time in minutes between PCF practices and their matches in each PCF region with Google's automobile travel time, shown in Exhibit A.2.5.6. To estimate travel time, we approximated practice location based on a central location in the practice's Public Use Microdata Area (PUMA).⁴⁶ Because we approximated practices' locations in this way, two practices in the same PUMA are considered to have a travel time between them of 0 minutes. We believe the selected comparison group performed sufficiently well on all of these criteria to analyze the impact of PCF.

⁴⁵ Specifically: (1) We reweighted comparisons so that the sum of the weighted comparison practices equals the number of PCF practices in that matched set. For example, if we matched three comparison practices to a single PCF practice, we gave each of the three comparison practices a weight of 1/3. If we matched two PCF practices to a single comparison, we gave the comparison practice a weight of 2. (2) We then reweighted each comparison group practice so the number of weighted comparison beneficiaries in the state would equal the number of PCF beneficiaries in the state. For example, if a state had 100,000 PCF beneficiaries but only 80,000 matched comparison beneficiaries in a given cohort, we multiplied the weight for each comparison practice in the state and cohort by 5/4 (that is, 100,000/80,000). Therefore, on a reweighted basis, that state's PCF group and comparison group would both represent 100,000 beneficiaries. This ensured that the comparison group selected in each state had equal influence on the overall analysis as the PCF group in its state.

⁴⁶ PUMAs are defined by the U.S. Census Bureau as non-overlapping statistical geographic areas that partition each state into areas containing no fewer than 100,000 people each.

Exhibit A.2.5.2. Cohort 1 post-matching balance on characteristics and outcomes

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
CDC Social Vulnerability Index	Geographic area	ATSDR CDC	0.42	0.43	-0.01	-0.10
Hospital beds per capita in the county of practice location	Geographic area	ARHF	2,939	2,547	392	0.07
Hospital Herfindahl-Hirschman Index (measure of market concentration)	Geographic area	HCRIS	2,843	2,716	126	0.11
HRSA-designated health professional shortage score for mental health	Geographic area	HRSA	18	18	0	-0.09
HRSA-designated health professional shortage score for primary care	Geographic area	HRSA	17	16	0	0.03
Percentage in poverty	Geographic area	ACS 5-year sample	11%	11%	0%	-0.09
Unemployment rate	Geographic area	ACS 5-year sample	5%	5%	0%	0.03
Household income	Geographic area	ACS 5-year sample	\$86,357	\$85,398	\$958	0.04
Medicare Advantage market penetration rate	Geographic area	CMS Geographic Public Use File	43	43	1	0.05
COVID-19 cases in the county where the practice is located (per 100,000) in the year before PCF started	Geographic area, COVID	USAFACTS	1,380	1,364	16	0.03
COVID-19 deaths in the county where the practice is located (per 100,000) in the year before PCF started	Geographic area, COVID	USAFACTS	40	40	1	0.02
Pandemic Vulnerability Index	Geographic area, COVID	NIEHS	0.50	0.50	0.00	0.00
Percentage of adults 65 and older fully vaccinated for COVID-19 during the baseline period ^a	Geographic area, COVID	CDC	N.A.	N.A.	N.A.	N.A.
U.S. COVID Community Vulnerability Index	Geographic area, COVID	Surgo Ventures	0.60	0.60	0.00	0.02

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Percentage of assigned beneficiaries dually eligible for Medicare and Medicaid	Beneficiary demographics and Medicare enrollment characteristics	MBSF	14%	14%	0%	-0.03
Percentage of American Indian and Alaska Native beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	MBISG ^b	0%	1%	-1%	-1.09
Percentage of Asian beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	MBISG ^b	3%	4%	-1%	-0.08
Percentage of Black beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	MBISG ^b	6%	6%	0%	0.03
Percentage of Hispanic beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	MBISG ^b	4%	4%	0%	-0.01
Percentage of White beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	MBISG ^b	84%	83%	1%	0.08
Percentage of beneficiaries younger than age 50	Beneficiary demographics and Medicare enrollment characteristics	EDB	4%	4%	0%	-0.04
Percentage of beneficiaries ages 50 to 54	Beneficiary demographics and Medicare enrollment characteristics	EDB	2%	2%	0%	-0.05
Percentage of beneficiaries ages 55 to 59	Beneficiary demographics and Medicare enrollment characteristics	EDB	3%	3%	0%	-0.08
Percentage of beneficiaries ages 60 to 64	Beneficiary demographics and Medicare enrollment characteristics	EDB	6%	6%	0%	-0.02

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Percentage of beneficiaries ages 65 to 69	Beneficiary demographics and Medicare enrollment characteristics	EDB	25%	25%	0%	0.00
Percentage of beneficiaries ages 70 to 74	Beneficiary demographics and Medicare enrollment characteristics	EDB	23%	23%	0%	0.10
Percentage of beneficiaries ages 75 to 79	Beneficiary demographics and Medicare enrollment characteristics	EDB	17%	17%	0%	0.01
Percentage of beneficiaries ages 80 to 84	Beneficiary demographics and Medicare enrollment characteristics	EDB	11%	11%	0%	-0.01
Percentage of beneficiaries ages 85 to 89	Beneficiary demographics and Medicare enrollment characteristics	EDB	6%	6%	0%	0.00
Percentage of beneficiaries age 90 or older	Beneficiary demographics and Medicare enrollment characteristics	EDB	4%	4%	0%	0.00
Percentage of female beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	EDB	58%	58%	0%	0.00
Percentage of beneficiaries residing in rural areas	Beneficiary demographics and Medicare enrollment characteristics	ARHF (2020)	11%	14%	-2%	-0.09
Percentage of beneficiaries with an advance care plan	Beneficiary demographics and Medicare enrollment characteristics	MBSF	5%	5%	0%	0.02
Percentage of beneficiaries with old age and survivors' insurance as the original reason for their Medicare entitlement	Beneficiary demographics and Medicare enrollment characteristics	MBSF	81%	81%	1%	0.06

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Percentage of beneficiaries with disability insurance as the original reason for their Medicare entitlement	Beneficiary health	MBSF	18%	19%	-1%	-0.06
Beneficiary's HCC score in the first baseline year	Beneficiary health	Claims, EDB, MBSF	0.92	0.92	0.00	0.01
Percentage of beneficiaries with advanced cancer	Beneficiary health	Claims (HCC indicator)	13%	13%	0%	-0.01
Percentage of beneficiaries with Alzheimer's disease or dementia	Beneficiary health	Claims (HCC indicator)	4%	4%	0%	0.03
Percentage of beneficiaries with any arthritis	Beneficiary health	Claims (HCC indicator)	7%	7%	0%	0.00
Percentage of beneficiaries with chronic kidney disease	Beneficiary health	Claims (HCC indicator)	7%	7%	0%	0.02
Percentage of beneficiaries with chronic obstructive pulmonary disease	Beneficiary health	Claims (HCC indicator)	11%	12%	-1%	-0.14
Percentage of beneficiaries with diabetes	Beneficiary health	Claims (HCC indicator)	24%	25%	-1%	-0.11
Percentage of beneficiaries with heart failure	Beneficiary health	Claims (HCC indicator)	10%	10%	0%	-0.14
Percentage of beneficiaries with hyperlipidemia	Beneficiary health	Claims (CCW indicator)	65%	65%	0%	0.03
Percentage of beneficiaries with hypertension	Beneficiary health	Claims (CCW indicator)	66%	66%	0%	-0.04
Percentage of beneficiaries with ischemic heart disease	Beneficiary health	Claims (HCC indicator)	6%	6%	0%	0.02
Percentage of beneficiaries with any substance abuse disorder	Beneficiary health	Claims	3%	3%	0%	0.05
Percentage of beneficiaries with any anxiety	Beneficiary health	Claims	13%	13%	0%	-0.01
Percentage of beneficiaries with any depression	Beneficiary health	Claims (HCC indicator)	10%	9%	1%	0.12

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Percentage of beneficiaries with high fragmentation of ambulatory care	Beneficiary health	Claims	51%	46%	4%	0.39
Risk group 1 (projected ^c)	Beneficiary health	Claims	96%	97%	-1%	-0.06
Risk group 2 (projected ^c)	Beneficiary health	Claims	3%	2%	1%	0.07
Risk group 3 (projected ^c)	Beneficiary health	Claims	1%	1%	0%	-0.03
Risk group 4 (projected ^c)	Beneficiary health	Claims	0%	0%	0%	0.03
Acute hospitalizations, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	264	267	-3	-0.05
Acute medical hospitalizations, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	219	223	-3	-0.05
Acute surgical hospitalizations, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	94	93	0	0.02
Acute hospitalizations in the first year of the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	285	289	-4	-0.05
Acute hospitalizations in the second year of the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	245	247	-3	-0.04
Acute hospitalizations in the year before the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	284	286	-2	-0.02
Outpatient ED visits in the first year of to the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	495	512	-17	-0.10
Outpatient ED visits in the second year of the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	381	395	-15	-0.11

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Outpatient ED visits in the year before the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	497	512	-14	-0.08
Percentage of index discharges with a readmission within 30 days of discharge	Beneficiary service use and expenditures	Claims	15%	15%	0%	0.05
Percentage of index ED discharges with an unplanned acute care visit within 30 days of discharge	Beneficiary service use and expenditures	Claims	27%	27%	-1%	-0.10
Percentage of index hospital discharges with an unplanned acute care visit within 30 days of discharge	Beneficiary service use and expenditures	Claims	25%	25%	0%	0.01
Ambulatory telehealth visits with a primary care provider, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	865	823	42	0.09
Potentially preventable ED visits, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	41	44	-3	-0.13
Potentially preventable hospitalizations, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	51	53	-2	-0.08
Primary-care-substitutable ED visits, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	158	165	-7	-0.12
Primary care visits to non-behavioral health specialists in ambulatory settings, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	4,464	4,276	188	0.13
Urgent care center visits, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	166	166	-1	0.00

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Percentage of beneficiaries with Part D coverage with claims for high-risk medications	Beneficiary demographics and Medicare enrollment characteristics	MBSF	15%	15%	0%	0.00
Total inpatient expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$333	\$331	\$2	0.02
Acute hospitalization expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$314	\$316	-\$2	-0.02
Home health expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$52	\$50	\$2	0.04
Post-acute care expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$161	\$160	\$1	0.01
SNF expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$57	\$60	-\$3	-0.09
Total Medicare Part A and B expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$970	\$969	\$1	0.01
Total Medicare Part A and B expenditures in the first year of the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$993	\$989	\$4	0.02
Total Medicare Part A and B expenditures in the second year of the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$948	\$950	-\$1	-0.01
Total Medicare Part A and B expenditures in the year before the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$942	\$941	\$1	0.00
1 or 2 provider clinicians (any specialty)	Practice	OneKey	11%	24%	-13%	-0.40
3 or 4 provider clinicians (any specialty)	Practice	OneKey	36%	32%	3%	0.07
6 to 9 provider clinicians (any specialty)	Practice	OneKey	27%	23%	4%	0.09
10 or more provider clinicians (any specialty)	Practice	OneKey	26%	20%	6%	0.13

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Advanced APM participation for at least part of the two-year baseline	Practice	OneKey	78%	73%	5%	0.13
Advanced APM participation for the full two-year baseline	Practice	OneKey	21%	25%	-4%	-0.10
CPC+ participation	Practice	OneKey	<0%	3%	-3%	-0.48
Direct Contracting participation for the full two-year baseline	Practice	OneKey	0%	0%	0%	0.00
Final MIPS composite score for each practice, averaged across all assigned NPIs within the practice	Practice	OneKey	90	86	4	0.39
Independent ownership status	Practice	OneKey	13%	25%	-12%	-0.35
Number of assigned beneficiaries during the baseline period	Practice	Claims and PCF payment algorithm	1,385	1,159	226	0.18
Number of hours practice is open after 5 p.m. on weekdays and hours open Saturday or Sunday	Practice	OneKey	4	3	1	0.09
Number of providers (any specialty)	Practice	Claims	12	10	2	0.06
Number of primary care providers Number	Practice	Claims	6	5	1	0.12
Participation in a Medicare Shared Savings Program advanced APM track in the two years before baseline	Practice	MDM	14%	14%	0%	0.01
Participation in Medicare Shared Savings Program (any track) in the two years before baseline	Practice	MDM	50%	45%	5%	0.11
NCQA accreditation or certification	Practice	NCQA data extracts	23%	16%	7%	0.17
Percentage of charges that are primary care	Practice	OneKey	76%	78%	-2%	-0.13
Percentage of providers at the practice that are primary care providers	Practice	OneKey	67%	61%	5%	0.21
Percentage owned by a health system	Practice	OneKey	75%	67%	8%	0.19

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Multispecialty practice	Practice	OneKey	45%	40%	5%	0.09
Practice TIN bills hospital-based services	Practice	Claims	17%	15%	2%	0.04

Notes: All mean amounts are weighted by assigned beneficiaries during the two-year baseline at each practice. Per-beneficiary measures are defined over the assigned beneficiaries at each practice.

^a COVID-19 vaccination information was not available in the Cohort 1 baseline, which ended in 2020, before the widespread availability of COVID-19 vaccines.

^b Race values are MBISG probabilities filled with EDB and RTI race information when missing.

^c Risk groups are projected based on the mean HCC scores among assigned beneficiaries and might differ from CMS' risk groups. This is necessary to have a single risk group definition for PCF and non-PCF practices.

ACS = American Community Survey; ARHF = Area Health Resource File; APM = Alternative Payment Model; ATSDR = Agency for Toxic Substances and Disease Registry; CCW = Chronic Conditions Data Warehouse; CDC = Centers for Disease Control and Prevention; CPC+ = Comprehensive Primary Care Plus; ED = emergency department; EDB = enrollment database; HCC = hierarchical condition category; HCRIS = Healthcare Provider Cost Reporting Information System; HRSA = Health Resources and Services Administration; MBISG = Medicare Bayesian Improved Surname Geocoding; MBSF = Master Beneficiary Summary File; MDM = Master Data Management; MIPS = Merit-based Incentive Payment System; NCQA = National Committee for Quality Assurance; NIEHS = National Institute of Environmental Health Sciences; NPI = National Provider Identifier; PCMH = primary care medical home; RTI = Research Triangle Institute; SNF = skilled nursing facility; TIN = Taxpayer Identifier Number.

Exhibit A.2.5.3. Cohort 2 post-matching balance on characteristics and outcomes

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
CDC Social Vulnerability Index	Geographic area	ATSDR CDC	0.39	0.39	0.00	-0.03
Hospital beds per capita in the county of practice location	Geographic area	ARHF	1,941	1,766	176	0.07
Hospital Herfindahl-Hirschman Index (measure of market concentration)	Geographic area	HCRIS	2,661	2,784	-123	-0.10
HRSA-designated health professional shortage score for mental health	Geographic area	HRSA	18	18	0	-0.04
HRSA-designated health professional shortage score for primary care	Geographic area	HRSA	16	16	0	0.01
Percentage in poverty	Geographic area	ACS five-year sample	11%	11%	0%	-0.11
Unemployment rate	Geographic area	ACS five-year sample	5%	5%	0%	0.00
Household income	Geographic area	ACS five-year sample	\$86,582	\$84,509	\$2,074	0.10
Medicare Advantage market penetration rate	Geographic area	CMS Geographic Public Use File	43	43	1	0.06
COVID-19 cases in the county where the practice is located (per 100,000) in the year before PCF started	Geographic area, COVID	USAfacts	10,178	10,356	-178	-0.07
COVID-19 deaths in the county where the practice is located (per 100,000) in the year before PCF started	Geographic area, COVID	USAfacts	173	176	-4	-0.05
Pandemic Vulnerability Index	Geographic area, COVID	NIEHS	0.49	0.50	-0.01	-0.10
Percentage of adults age 65 and older fully vaccinated for COVID-19 during the baseline period ^a	Geographic area, COVID	CDC	86%	86%	0%	0.05
U.S. COVID Community Vulnerability Index	Geographic area, COVID	Surgo Ventures	0.52	0.51	0.01	0.04

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Percentage of assigned beneficiaries dually eligible for Medicare and Medicaid	Beneficiary demographics and Medicare enrollment characteristics	MBSF	11%	11%	-1%	-0.07
Percentage of American Indian and Alaska Native beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	MBISG ^a	0%	1%	0%	-0.30
Percentage of Asian beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	MBISG ^a	3%	3%	0%	0.01
Percentage of Black beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	MBISG ^a	5%	4%	1%	0.07
Percentage of Hispanic beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	MBISG ^a	3%	3%	0%	-0.07
Percentage of White beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	MBISG ^a	87%	87%	0%	-0.01
Percentage of beneficiaries younger than age 50	Beneficiary demographics and Medicare enrollment characteristics	EDB	3%	4%	0%	-0.06
Percentage of beneficiaries ages 50 to 54	Beneficiary demographics and Medicare enrollment characteristics	EDB	1%	1%	0%	-0.09
Percentage of beneficiaries ages 55 to 59	Beneficiary demographics and Medicare enrollment characteristics	EDB	2%	2%	0%	-0.06
Percentage of beneficiaries ages 60 to 64	Beneficiary demographics and Medicare enrollment characteristics	EDB	5%	5%	0%	-0.09

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Percentage of beneficiaries ages 65 to 69	Beneficiary demographics and Medicare enrollment characteristics	EDB	26%	26%	0%	0.05
Percentage of beneficiaries ages 70 to 74	Beneficiary demographics and Medicare enrollment characteristics	EDB	24%	24%	0%	0.07
Percentage of beneficiaries ages 75 to 79	Beneficiary demographics and Medicare enrollment characteristics	EDB	17%	16%	0%	0.05
Percentage of beneficiaries ages 80 to 84	Beneficiary demographics and Medicare enrollment characteristics	EDB	11%	11%	0%	-0.01
Percentage of beneficiaries ages 85 to 89	Beneficiary demographics and Medicare enrollment characteristics	EDB	6%	6%	0%	-0.03
Percentage of beneficiaries age 90 or older	Beneficiary demographics and Medicare enrollment characteristics	EDB	4%	4%	0%	0.00
Percentage of female beneficiaries	Beneficiary demographics and Medicare enrollment characteristics	EDB	58%	57%	0%	0.03
Percentage of beneficiaries residing in rural areas	Beneficiary demographics and Medicare enrollment characteristics	ARHF (2020)	14%	14%	0%	0.00
Percentage of beneficiaries with an advance care plan	Beneficiary demographics and Medicare enrollment characteristics	MBSF	5%	5%	0%	0.01
Percentage of beneficiaries with old age and survivors' insurance as the original reason for their Medicare entitlement	Beneficiary demographics and Medicare enrollment characteristics	MBSF	84%	83%	1%	0.08

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Percentage of beneficiaries with disability insurance as the original reason for their Medicare entitlement	Beneficiary health	MBSF	16%	17%	-1%	-0.09
Beneficiary HCC score in the first baseline year	Beneficiary health	Claims, EDB, MBSF	0.89	0.89	0.00	0.02
Percentage of beneficiaries with advanced cancer	Beneficiary health	Claims (HCC indicator)	13%	13%	0%	0.10
Percentage of beneficiaries with Alzheimer's disease or dementia	Beneficiary health	Claims (HCC indicator)	4%	4%	0%	0.01
Percentage of beneficiaries with any arthritis	Beneficiary health	Claims (HCC indicator)	7%	7%	0%	0.05
Percentage of beneficiaries with chronic kidney disease	Beneficiary health	Claims (HCC indicator)	8%	8%	0%	0.08
Percentage of beneficiaries with chronic obstructive pulmonary disease	Beneficiary health	Claims (HCC indicator)	11%	11%	0%	-0.08
Percentage of beneficiaries with diabetes	Beneficiary health	Claims (HCC indicator)	23%	23%	0%	-0.02
Percentage of beneficiaries with heart failure	Beneficiary health	Claims (HCC indicator)	10%	10%	0%	0.04
Percentage of beneficiaries with hyperlipidemia	Beneficiary health	Claims (CCW indicator)	64%	64%	1%	0.07
Percentage of beneficiaries with hypertension	Beneficiary health	Claims (CCW indicator)	65%	65%	0%	-0.02
Percentage of beneficiaries with ischemic heart disease	Beneficiary health	Claims (HCC indicator)	6%	6%	0%	-0.04
Percentage of beneficiaries with any substance abuse disorder	Beneficiary health	Claims	2%	2%	0%	-0.02
Percentage of beneficiaries with any anxiety	Beneficiary health	Claims	13%	12%	0%	0.06
Percentage of beneficiaries with any depression	Beneficiary health	Claims	10%	10%	0%	0.10
Percentage of beneficiaries with high fragmentation of ambulatory care	Beneficiary health	Claims	51%	47%	4%	0.34

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Risk group 1 (projected ^b)	Beneficiary health	Claims	98%	97%	0%	0.03
Risk group 2 (projected ^b)	Beneficiary health	Claims	2%	2%	0%	-0.01
Risk group 3 (projected ^b)	Beneficiary health	Claims	0%	1%	0%	-0.02
Risk group 4 (projected ^b)	Beneficiary health	Claims	0%	0%	0%	-0.04
Acute hospitalizations, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	233	231	2	0.03
Acute medical hospitalizations, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	194	191	2	0.03
Acute surgical hospitalizations, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	83	82	1	0.03
Acute hospitalizations in the first year of the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	229	227	2	0.03
Acute hospitalizations in the second year of the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	237	235	2	0.02
Acute hospitalizations in the year before the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	272	271	1	0.02
Outpatient ED visits in the first year of to the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	351	358	-7	-0.06
Outpatient ED visits in the second year of the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	384	401	-17	-0.13
Outpatient ED visits in the year before the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	462	477	-15	-0.09

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Percentage of index discharges with a readmission within 30 days of discharge	Beneficiary service use and expenditures	Claims	14%	14%	0%	0.10
Percentage of index ED discharges with an unplanned acute care visit within 30 days of discharge	Beneficiary service use and expenditures	Claims	26%	26%	0%	-0.02
Percentage of index hospital discharges with an unplanned acute care visit within 30 days of discharge	Beneficiary service use and expenditures	Claims	24%	23%	0%	0.02
Ambulatory telehealth visits with a primary care provider, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	1,154	1,102	52	0.08
Potentially preventable ED visits, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	32	33	-1	-0.09
Potentially preventable hospitalizations, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	43	43	0	0.01
Primary-care-substitutable ED visits, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	122	127	-5	-0.10
Primary care visits to non-behavioral health specialists in ambulatory settings, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	3,864	3,848	15	0.01
Urgent care center visits, annualized over the two-year baseline (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	172	177	-6	-0.05
Percentage of beneficiaries with Part D coverage with claims for high-risk medications	Beneficiary demographics and Medicare enrollment characteristics	MBSF	14%	14%	0%	-0.01

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Total inpatient expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$308	\$305	\$3	0.04
Acute hospitalization expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$291	\$288	\$3	0.03
Home health expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$38	\$37	\$1	0.03
Post-acute care expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$140	\$137	\$3	0.06
SNF expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$54	\$54	\$0	-0.01
Total Medicare Part A and B expenditures, annualized over the two-year baseline (per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$921	\$918	\$3	0.02
Total Medicare Part A and B expenditures in the first year of the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$857	\$849	\$8	0.04
Total Medicare Part A and B expenditures in the second year of the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$985	\$983	\$1	0.01
Total Medicare Part A and B expenditures in the year before the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$918	\$913	\$5	0.03
1 or 2 provider clinicians (any specialty)	Practice	OneKey	9%	21%	-12%	-0.42
3 or 4 provider clinicians (any specialty)	Practice	OneKey	27%	30%	-3%	-0.08
6 to 9 provider clinicians (any specialty)	Practice	OneKey	28%	22%	5%	0.11
10 or more provider clinicians (any specialty)	Practice	OneKey	37%	26%	10%	0.21
Advanced APM participation for at least part of the two-year baseline	Practice	OneKey	46%	66%	-19%	-0.38

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Advanced APM participation for the full two-year baseline	Practice	OneKey	52%	28%	24%	0.48
CPC+ participation	Practice	OneKey	65%	20%	45%	0.95
Direct Contracting participation for the full two-year baseline	Practice	OneKey	0%	0%	0%	0.02
Final MIPS composite score for each practice, averaged across all assigned NPIs within the practice	Practice	OneKey	89	90	-1	-0.06
Independent ownership status	Practice	OneKey	15%	26%	-11%	-0.31
Number of assigned beneficiaries during the baseline period	Practice	Claims and PCF payment algorithm	1,339	1,141	198	0.20
Number of hours practice is open after 5 p.m. on weekdays and hours open Saturday or Sunday	Practice	OneKey	4	3	0	0.06
Number of providers (any specialty)	Practice	Claims	12	9	3	0.16
Number of primary care providers	Practice	Claims	6	4	2	0.27
Participation in a Medicare Shared Savings Program advanced APM track in two years before baseline	Practice	MDM	13%	12%	1%	0.02
Participation in Medicare Shared Savings Program (any track) in two years before baseline	Practice	MDM	41%	41%	-1%	-0.02
NCQA accreditation or certification	Practice	NCQA data extracts	29%	24%	5%	0.10
Percentage of charges that are primary care	Practice	OneKey	76%	76%	0%	0.01
Percentage of providers at practice that are primary care providers	Practice	OneKey	63%	62%	1%	0.04
Percentage owned by a health system	Practice	OneKey	68%	61%	6%	0.14
Multispecialty practice	Practice	OneKey	44%	40%	4%	0.08
Practice TIN bills hospital-based services	Practice	Claims	15%	12%	2%	0.07

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Notes: All mean amounts are weighted by assigned beneficiaries during the two-year baseline at each practice. Per-beneficiary measures are defined over the assigned beneficiaries at each practice.

^a Race values are MBISG probabilities filled with EDB and RTI race information when missing.

^b Risk groups are projected based on the mean HCC among assigned beneficiaries and might differ from CMS' risk groups. This is necessary to have a single risk group definition for PCF and non-PCF practices.

ACS = American Community Survey; ARHF = Area Health Resource File; APM = Alternative Payment Model; ATSDR = Agency for Toxic Substances and Disease Registry; CCW = Chronic Conditions Data Warehouse; CDC = Centers for Disease Control and Prevention; CPC+ = Comprehensive Primary Care Plus; ED = emergency department; EDB = enrollment database; HCC = hierarchical condition category; HCRIS = Healthcare Provider Cost Reporting Information System; HRSA = Health Resources and Services Administration; MBISG = Medicare Bayesian Improved Surname Geocoding; MBSF = Master Beneficiary Summary File; MDM = Master Data Management; MIPS = Merit-based Incentive Payment System; NIEHS = National Institute of Environmental Health Sciences; NPI = National Provider Identifier; NCQA = National Committee for Quality Assurance; PCMH = primary care medical home; RTI = Research Triangle Institute; SNF = skilled nursing facility; TIN = Taxpayer Identifier Number.

Exhibit A.2.5.4. CPC+ alumni post-matching balance on high priority characteristics and outcomes

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
CDC Social Vulnerability Index	Geographic area	ATSDR CDC (2018)	0.38	0.39	-0.01	-0.07
Percentage of beneficiaries residing in rural areas	Beneficiary demographics and Medicare enrollment characteristics	ARHF (2020)	13%	14%	0%	-0.01
Beneficiary HCC score in the first baseline year	Beneficiary health	Claims, EDB, MBSF	0.88	0.89	-0.01	-0.07
Number of assigned beneficiaries during the baseline period	Practice	Claims and PCF payment algorithm	1,367	1,179	188	0.19
Number of providers (any specialty)	Practice	Claims	11	9	2	0.17
Percentage owned by a health system	Practice	OneKey	14%	10%	4%	0.12
Practice TIN bills hospital-based services	Practice	Claims	38%	41%	-3%	-0.06
Participation in a Medicare Shared Savings Program advanced APM track in two years before baseline	Practice	MDM	71%	63%	8%	0.17
Participation in Medicare Shared Savings Program (any track) in two years before baseline	Practice	MDM	14%	13%	1%	0.04
Acute hospitalizations in the first year of the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	226	229	-3	-0.05
Acute hospitalizations in the second year of the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	233	237	-4	-0.07
Acute hospitalizations in the year before the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	269	273	-4	-0.07
Total Medicare Part A and B expenditures in the first year of the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$837	\$841	-\$5	-0.03

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Total Medicare Part A and B expenditures in the second year of the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$958	\$976	-\$17	-0.10
Total Medicare Part A and B expenditures in the before the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$898	\$908	-\$9	-0.06

Notes: All mean amounts are weighted by assigned beneficiaries during the two-year baseline at each practice. Per-beneficiary measures are defined over the assigned beneficiaries at each practice.

APM = Alternative Payment Model; ARHF = Area Health Resource File; ATSDR = Agency for Toxic Substances and Disease Registry; CDC = Centers for Disease Control and Prevention; CPC+ = Comprehensive Primary Care Plus; EDB = enrollment database; HCC = hierarchical condition category; MBSF = Master Beneficiary Summary File; MDM = Master Data Management; TIN = Taxpayer Identifier Number.

Exhibit A.2.5.5. Non-CPC+ alumni post-matching balance on high priority characteristics and outcomes

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
CDC Social Vulnerability Index	Geographic area	ATSDR CDC (2018)	0.41	0.41	0.00	-0.02
Percentage of beneficiaries residing in rural areas	Beneficiary demographics and Medicare enrollment characteristics	ARHF (2020)	13%	14%	-1%	-0.04
Beneficiary HCC score in the first baseline year	Beneficiary health	Claims, EDB, MBSF	0.91	0.90	0.01	0.08
Number of assigned beneficiaries during the baseline period	Practice	Claims and PCF payment algorithm	1,337	1,120	217	0.19
Number of providers (any specialty)	Practice	OneKey	13	10	3	0.09
Percentage owned by a health system	Practice	OneKey	13%	15%	-2%	-0.06
Practice TIN bills hospital-based services	Practice	Claims	47%	44%	4%	0.09
Participation in a Medicare Shared Savings Program advanced APM track in two years before baseline	Practice	MDM	69%	63%	6%	0.13
Participation in Medicare Shared Savings Program (any track) in two years before baseline	Practice	MDM	16%	13%	3%	0.08
Acute hospitalization utilization in the first year of the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	261	255	5	0.06
Average acute hospitalization utilization in the second year of the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	244	240	5	0.06
Average acute hospitalization utilization in the year before the two-year baseline period (per 1,000 beneficiaries per year)	Beneficiary service use and expenditures	Claims	282	277	5	0.05
Total Medicare Part A and B expenditures in the first year of the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$945	\$922	\$22	0.09

Appendix A.2. Additional methodological details of processing and analyzing secondary data

Measure	Characteristic type	Source	PCF mean	Comparison mean	Difference	Standardized difference
Total Medicare Part A and B expenditures in the second year of the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$990	\$973	\$17	0.06
Total Medicare Part A and B expenditures in the year before the two-year baseline period (dollars per beneficiary per month)	Beneficiary service use and expenditures	Claims	\$949	\$931	\$18	0.07

Notes: All mean amounts are weighted by assigned beneficiaries during the two-year baseline at each practice. Beneficiary measures are defined over the assigned beneficiaries at each practice.

APM = Alternative Payment Model; ARHF = Area Health Resource File; ATSDR = Agency for Toxic Substances and Disease Registry; CDC = Centers for Disease Control and Prevention; CPC+ = Comprehensive Primary Care Plus; EDB = enrollment database; HCC = hierarchical condition category; MBSF = Master Beneficiary Summary File; MDM = Master Data Management; TIN = Taxpayer Identifier Number.

Exhibit A.2.5.6. Distribution of PCF practices across PCF regions and their average travel time (in minutes) to matched comparison practices in each region

PCF regions	Cohort 1			Cohort 2		
	Number of PCF practices	Number of assigned baseline beneficiaries	Mean travel time	Number of PCF practices	Number of assigned baseline beneficiaries	Mean travel time
Arizona	13	17,090	17	99	166,042	11
California	88	163,876	22	92	251,081	15
Colorado	10	7,941	21	114	165,742	18
Delaware	12	25,341	14	4	17,045	20
Florida	96	320,946	17	76	205,983	17
Hawaii	3	1,408	8	40	52,800	6
Louisiana	3	7,156	4	11	26,533	23
Massachusetts	58	105,859	33	42	141,919	28
Maine	43	40,456	30	18	15,859	37
Michigan	36	40,816	16	266	366,524	17
Kansas City	8	8,825	18	86	105,206	42
Montana	0	0	N.A.	25	22,613	96
North Dakota	0	0	N.A.	16	27,196	27
Nebraska	13	18,213	12	20	82,601	14
New Hampshire	5	28,205	16	8	34,421	22
New Jersey	65	102,023	21	246	474,945	16
New York (Hudson Valley and Greater Buffalo regions)	29	26,501	27	94	112,802	39
Ohio and northern Kentucky	81	70,646	36	389	329,641	34
Oklahoma	26	34,797	37	90	95,036	16
Oregon	14	15,149	21	77	118,167	18
Greater Philadelphia	56	57,603	37	155	272,733	35
Rhode Island	0	0	N.A.	34	61,757	13
Tennessee	36	54,514	17	23	58,440	11
Virginia	54	131,189	25	12	27,817	7

Notes: To speed computation, we approximated practices' locations based on a central location of their Public Use Microdata Area. These areas are defined by the U.S. Census Bureau to be non-overlapping statistical geographic areas that partition each state into geographic areas containing no fewer than 100,000 people each. Because we approximated practices' locations as a central location within the Public Use Microdata Area, two practices in the same Public Use Microdata Area are considered to have a travel time of 0 minutes between them.

A.2.6. Empirical strategy of the frequentist (main) regression analyses

This section describes the regression approach used to produce frequentist impact estimates for Medicare claims-based outcomes. We used a difference-in-differences regression model to estimate impacts during the first two performance years of the model for PCF practices relative to their matched comparisons. In brief, this method estimated impacts of PCF as the difference in outcomes observed between PCF and comparison practices, minus any difference in outcomes that existed between those same practices before PCF started, adjusting for differences in practice characteristics (such as practice size or medical complexity of the patient panel). This section describes the method in detail. We first describe the study population and unit of observation in the regression models (section 1) and then discuss details of the regression specification and estimation approach (section 2). Next, we describe control variables included in the regressions (section 3). Finally, we describe the practice-level subgroup analyses (section 4).

A. Study population and unit of observation in the regression analysis

Population covered

The analysis of Medicare outcomes included beneficiaries with Parts A and B coverage for whom Medicare is the primary payer, including beneficiaries dually eligible for Medicaid. We used a cross-sectional approach to define the study population, with different—but highly overlapping—cross-sections in each baseline and performance year (Exhibit A.2.6.1). Using these definitions, it was possible for a beneficiary to be in the study population (1) only during the baseline years (for example, if the beneficiary died during the baseline years or was no longer attributed to a PCF or comparison practice during the performance years) or (2) only during the performance years—which occurred if the beneficiary was first attributed to an intervention or comparison practice during one of the performance years (for example, when new to Medicare).

Exhibit A.2.6.1. Population covered under the cross-sectional study design

Cross-section	Time period covered	Study population definition
First baseline year	Cohort 1: January 1, 2019, to December 31, 2019 Cohort 2: January 1, 2020, to December 31, 2020	Beneficiaries assigned to the intervention or comparison practices based on attribution during the year
Second baseline year	Cohort 1: January 1, 2020, to December 31, 2020 Cohort 2: January 1, 2021, to December 31, 2021	Beneficiaries assigned to the intervention or comparison practices based on attribution during the second baseline year or the previous year
First performance year	Cohort 1: January 1, 2021, to December 31, 2021 Cohort 2: January 1, 2022, to December 31, 2022	Beneficiaries assigned to the intervention or comparison practices based on attribution during the year
Second performance year	Cohort 1: January 1, 2022, to December 31, 2022	Beneficiaries assigned to cohort 1 intervention or comparison practices based on attribution during the year or the previous performance year

Unit of observation

Although the population covered for the analysis of claims-based outcomes was a cross-section of beneficiaries, the unit of observation in the regression models was the *practice-year*. Specifically, we aggregated beneficiary-year observations to (weighted) practice-year averages. The weights incorporated assigned beneficiary counts each year so we could interpret impact estimates as effects of PCF on the average beneficiary, not as effects on the average practice. As a result, practices had observations for as many years as they had at least one assigned beneficiary. For observations for calendar year 2020 (a baseline year for both cohorts), we included only outcomes measured during the last two quarters of the year because the outcomes from the first two quarters of the year were highly unusual as a result of delayed service use during the COVID-19 pandemic. Because this approach resulted in a baseline “year” that reflects only 6 months of data, we combined the baseline years into a single baseline period for purposes of estimating impacts (more details below).

For outcomes defined at the discharge level— proportion of inpatient stays with unplanned 30-day readmission and proportion of inpatient discharges, ED visits, or observation stays with follow-up billable service within seven days—we estimated impacts of PCF on the proportion of index events (such as inpatient hospitalization) that were followed by a qualifying follow-up event, such as an unplanned readmission within 30 days of the inpatient discharge. Before rolling up to the practice level, we limited the study population for each measure to only the subset of the study population that had at least one index event during the measurement period. Instead of cross-sections of beneficiaries, the data for the analysis comprised cross-sections of index events in each observation period, with the possibility of some overlap within and across periods among beneficiaries who had those index events. For example, someone who had two index events in the first performance year would have two observations that got rolled up to the practice level in the first performance year (one for each index event).

B. Model specification and interpretation of key coefficients

With the study population and unit of observation defined above, we estimated a linear difference-in-differences regression model for each claims-based outcome specified as follows:

$$(1) \quad \bar{y}_{jt} = \rho_j + \alpha_t + \sum_c \sum_{\tau \neq -1} \delta_{c,\tau} PCF_j * 1\{C_j = c\} * 1\{t - C_j = \tau\} + \beta_t X_j + \beta_t \bar{X}_{jt} + \varepsilon_{jt}$$

- \bar{y}_{jt} represents a claims-based outcome (averaged across beneficiaries at the practice) measured for practice j in year t . Years were defined so that $t = 0$ corresponds to the single reference period before the intervention (since we combined all the baseline years into a single baseline period) and $t = 1$ corresponds to the first performance year.
- ρ_j denotes practice fixed effects that control for practice characteristics—observed or unobserved—that are constant over time. Inclusion of these characteristics was intended to improve the precision of the impact estimates and to net out effects of differences in characteristics between the intervention and comparison groups that remained despite matching.

- α_t denotes calendar year fixed effects, intended to control for characteristics that are constant across practices but vary across calendar years (such as any nationwide trends in the outcome).
- The model includes a three-way interaction between the treatment indicator PCF_j , cohort indicators $1\{C_j = c\}$, where c corresponds to the year when the cohort starts the intervention, and relative-time indicators indexed by τ so that $\tau = -1$ corresponds to the reference baseline period before the intervention. $\delta_{c,\tau}$ represents the average treatment effect for cohort c for each relative year.
- X_j represents practice characteristics, such as health system affiliation, measured during the baseline years and interacted with year dummies to allow the association between practice characteristics and outcomes to vary over time. These variables adjust for cross-practice differences in characteristics that are plausibly correlated with intervention status and outcome trends. We describe the list of practice characteristics in more detail below.
- \bar{X}_{jt} denotes practice averages of beneficiary characteristics. \bar{X}_{jt} varies with t because the beneficiary population included in the practice average could change over time, even though all characteristics were measured at the start of the period (baseline or intervention). Beneficiary characteristics included demographics (age, race, and gender), variables capturing Medicare and Medicaid eligibility (that is, original reason for Medicare eligibility, and dual Medicare-Medicaid status), chronic condition flags, and HCC score. As with the practice characteristics described previously, we interacted these characteristics with year indicators to account for possible changes in the relationship between the characteristic measured at the start of the baseline or performance years and outcomes. We describe beneficiary characteristics covariates in more detail below.
- ε_{jt} is an idiosyncratic error term that represents unexplained variation in the outcome variable for each practice j in year t .

Accounting for possible contamination because of a staggered intervention start for Cohort 1 and Cohort 2

There is a growing literature that studies difference-in-differences models used to estimate dynamic treatment effects in settings where cohorts are exposed to an intervention at different times. This literature has focused largely on models that adjust for unit (such as practices) and time fixed effects (also referred to as two-way fixed effects models or TWFE models). Importantly, this literature has identified that these TWFE models *do not* generally recover the average treatment effect of an intervention in each relative period unless the assumption of treatment-effect homogeneity holds (that is, unless treatment effects are the same across cohorts in every relative period, including baseline years) (de Chaisemartin and D'Haultfoeuille 2020; Callaway and Sant'Anna 2021; Goodman-Bacon 2021; Sun and Abraham 2021). We did not necessarily expect the assumption of treatment-effects homogeneity to hold in the PCF setting because we expected that CPC+ participants might not be affected by PCF in the same way as other intervention practices, and nearly 60 percent of Cohort 2 practices were CPC+ participants compared with 0 percent in Cohort 1.

Based on the concerns identified in the literature, we implemented the regression-based method introduced by Sun and Abraham (2021). The Sun and Abraham method produces average treatment effects that are robust to contamination from treatment-effect heterogeneity in a setting with staggered intervention start dates. The Sun and Abraham procedure works as follows:

1. **Estimate cohort-specific average treatment effects for each year relative to the PCF start date.** Assuming parallel outcome trends between PCF and comparison practices if not for the model and no anticipatory treatment effects, the coefficients on the three-way interactions in Equation 1, $\hat{\delta}_{c,\tau}$, represent consistent estimates for the cohort-specific average treatment effect in each relative year, conditional on covariates.
8. **Calculate cohort shares in each relative year.** The cohort shares are equivalent to the (weighted) shares of assigned beneficiaries in Cohort 1 PCF practices and Cohort 2 PCF practices relative to the total number of assigned beneficiaries to PCF practices in the same relative year. For example, if in relative year t there were 1 million beneficiaries assigned to Cohort 1 PCF practices and 2 million beneficiaries assigned to Cohort 2 PCF practices, the cohort shares for relative year t equal one-third for Cohort 1 and two-thirds Cohort 2.
9. **Estimate the overall (combined) treatment effect in each relative year by combining cohort-specific estimates from step 1 within each relative year, using cohort shares in step 2 as weights.** Aggregating the coefficients $\hat{\delta}_{c,\tau}$ yields a consistent estimator of the average treatment effect for each relative year.

Accounting for non-independence

An important consideration for the regression models was how to account for non-independence of observations. For example, we expected correlations between the same practice observation over time. We selected a model with practice-level fixed effects and practice-level cluster-robust standard errors based on testing conducted as part of the evaluation of CPC+. The testing showed this specification had excellent performance in terms of the mean squared error of the difference-in-differences point estimate and the coverage of the confidence interval around this estimate—that is, it accurately reflected the uncertainty of the impact estimate (Peikes et al. 2020).

Interpretation

We used regression output to calculate p -values for statistical inference and used two-tailed tests with $p < 0.10$ as the threshold of statistical significance. To minimize the probability of mistaking noise for signal when examining impacts, we combined evidence from p -values with evidence from the hybrid-Bayesian analysis (described in more detail in Appendix A.2.7), subgroup analyses, related outcomes, sensitivity tests, and the implementation analysis to reinforce or discount the interpretation of observed results.

C. Regression model controls

The regression models for most outcomes controlled for (1) practice-level averages of beneficiary characteristics, (2) practice characteristics, (3) practice fixed effects, and (4) calendar-year fixed effects. We described controls (1) and (2) in more detail below.

Practice-level averages of beneficiary characteristics

Exhibit A.2.6.2 shows control variables measured at the beneficiary level and then rolled up to practice-level averages for the analysis of Medicare claims-based outcomes. These control variables included demographics (proportion of beneficiaries in age, race/ethnicity, and gender categories), original reason for Medicare entitlement, dual eligibility status, and HCC scores. For comprehensive risk adjustment, the regressions also controlled for the proportion of assigned beneficiaries with select chronic conditions (individual HCCs) that were prevalent in our sample (collapsing categories when appropriate).

For the performance years, the beneficiary-level control variables were defined at the start of PCF (January 1, 2021, for Cohort 1 and January 1, 2022, for Cohort 2). For observations in the baseline years, beneficiary-level control variables were measured at the start of the first baseline year (January 1, 2019, for Cohort 1 and January 1, 2020, for Cohort 2). For all controls, we included interactions between the individual variable and each performance year in the second year (or the second baseline year for the baseline-period observations). Because we used a difference-in-differences model, we did not control for Medicare service use or Part A and B expenditures during the baseline years as is common in a cross-sectional analysis. These baseline outcomes were the dependent variable for the baseline observations in our model and, therefore, cannot be viewed as independent of the error term.

Exhibit A.2.6.2. Beneficiary control variables for the analysis of Medicare claims-based outcomes

Domain	Variables
Demographics	<ul style="list-style-type: none"> • Proportion of assigned beneficiaries within the following age categories: <ul style="list-style-type: none"> – < 50 – 50–54 – 55–59 – 60–64 – 65–69 (reference category) – 70–74 – 75–79 – 80–84 – 85–89 – ≥ 90 • Proportion of assigned beneficiaries within the following race and ethnicity categories, based on MBISG probabilities: <ul style="list-style-type: none"> – Non-Hispanic White (reference category) – Non-Hispanic Black – American Indian/Alaska Native – Asian American and Native Hawaiian or other Pacific Islander – Hispanic – Multiracial – Missing MBISG flag (race category filled using RTI or EDB data)^a • Proportion of assigned beneficiaries who are female • Age, race and ethnicity, and gender variables separately interacted with second performance year (or second baseline year)
Original reason for Medicare eligibility	<ul style="list-style-type: none"> • Proportion of assigned beneficiaries with original reason for Medicare eligibility being age, and this proportion interacted with second performance year (or second baseline year)
Dual eligibility	<ul style="list-style-type: none"> • Proportion of assigned beneficiaries that are dually eligible (that is, those with full or partial Medicaid benefits according to the CMS Master Beneficiary Summary File), and this proportion interacted with the second performance year (or second baseline year)

Domain	Variables
Health status ^b	<ul style="list-style-type: none"> • Average HCC score among assigned beneficiaries, and this score interacted with the second performance year (or second baseline year) • Proportion of assigned beneficiaries with a new enrollee HCC score (that is, HCC score that was calculated based on demographic characteristics only), and this proportion interacted with the second performance year (or second baseline year) • Proportion of assigned beneficiaries with the following chronic conditions (and this proportion interacted with the second performance year or second baseline year): <ul style="list-style-type: none"> – HCC 8 – Metastatic Cancer and Acute Leukemia – HCC 18 – Diabetes with Chronic Complications – HCC 21 – Protein-Calorie Malnutrition – HCC 22 – Morbid Obesity – HCC 23 – Other Significant Endocrine and Metabolic Disorders – HCC 85 – Congestive Heart Failure – HCC 96 – Specified Heart Arrhythmias – HCC 106 – Atherosclerosis of the Extremities with Ulceration or Gangrene – HCC 111 – Chronic Obstructive Pulmonary Disease – HCC 173 – Traumatic Amputations and Complications – HCC 186 – Major Organ Transplant or Replacement Status – HCC 40 or 47 – Rheumatoid Arthritis and Inflammatory Connective Tissue Disease or Disorders of Immunity – HCC 46 or 48 - Severe Hematological Disorders, or Coagulation Defects and Other Specified Hematological Disorders – HCC 51 or 52 – Dementia – HCC 54 or 55 – Drug/Alcohol Psychosis or Dependence – HCC 57 or 58 – Schizophrenia or Major Depressive, Bipolar, and Paranoid Disorders – HCC 70 or 71 – Quadriplegia or Paraplegia – HCC 80 or 82 – Coma, Brain Compression/Anoxic Damage or Respirator Dependence/Tracheostomy Status – HCC 86, 87, or 88 – Acute Myocardial Infarction, Unstable Angina and Other Acute Ischemic Heart Disease, or Angina Pectoris – HCC 99 or 100 – Cerebral Hemorrhage, or Ischemic or Unspecified Stroke – HCC 107 or 108 – Vascular Disease, with Complications – HCC 157 or 158 – Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone; or of Skin with Full Thickness Skin Loss

Notes: Beneficiary-level control variables were measured directly at the start of PCF (for the performance-period observations) or directly at the start of the baseline (for the baseline-year observations).

^a For beneficiary records with missing MBISG race data, we filled in race categories using binary race data gathered from RTI or EDB data.

^b For control variables that reflect chronic conditions, we selected a small subset of the HCCs created by the HCC model. We selected conditions for inclusion based on the relative weight of specific HCCs in HCC score calculation as well as their prevalence in our analysis sample.

CMS = Centers for Medicare and Medicaid Services; EDB = Medicare enrollment database; HCC = Hierarchical Condition Category; MBISG = Medicare Bayesian improved surname geocoding; PCF = Primary Care First; RTI = Research Triangle Institute.

Practice-level averages of beneficiary characteristics

Exhibit A.2.6.3 shows the practice characteristics we included for the analysis of Medicare claims-based outcomes. We did not incorporate changes over time in observed practice characteristics among our control variables because the intervention could affect practice characteristics. To further adjust for confounding on observable control variables (and to avoid collinearity with the practice fixed effects), we interacted each practice characteristic with time (Zeldow and Hatfield 2021).

Exhibit A.2.6.3. Practice characteristics included in the analysis of Medicare claims-based outcomes

Domain	Variables
Health system affiliation	Indicator for practice affiliation with a health system (that is, a larger health care delivery organization that includes a hospital) based on data from OneKey
Independent	Indicator for whether practice is independent based on data from OneKey
Practice size	Categorical variable for practice size, defined by quartiles of number of NPIs at a practice in OneKey based on distribution among PCF practices
Multispecialty	Indicator for whether practice is a multispecialty practice based on data from OneKey
Any participation in CPC+	Indicator for whether PCF practice is a CPC+ participant. or, if it is a comparison practice, whether it is matched to CPC+ participant
Participated in Medicare Shared Savings Program during baseline years	Indicator for whether practice participated in Medicare Shared Savings Program (any track) during the PCF baseline based on data from the CMS Master Data Management system
Experience with another advanced APM during baseline years	Categorical measure of participation (zero, low, and high) based on the distribution of PCF provider participation across the following models: Next Generation ACO; BPCI Advanced; Tracks 2, 3, E or Enhanced of SSP, and non-SSP CPC+
Urbanicity	Categorical variable for whether practice site is in rural, suburban, or urban area based on data from 2020–2021 Area Health Resource File
PVI	County-level COVID-19 PVI measured in 2020 and produced by the National Institute of Environment Health Sciences
Social Vulnerability Index	County-level SVI measured in 2020 and produced by the Centers for Disease Control and Agency for Toxic Substances and Disease Registry

ACO = accountable care organization; APM = alternative payment model; BPCI = Bundled Payments for Care Improvement; CMS = Centers for Medicare & Medicaid Services; CPC+ = Comprehensive Primary Care Plus; NPI = national provider number; PCF = Primary Care First; PVI = pandemic vulnerability index; SSP = Shared Savings Program.

Additional control variables for event-level outcomes

Our analytic sample for proportion of inpatient stays with unplanned 30-day readmissions and proportion of inpatient discharges, ED visits, or observation stays with follow-up billable service within seven days were constructed from discharge-level observations. The regression models for the former outcome included additional control variables (each interacted with relative year) intended to risk-adjust for reason for admission, including (i) proportion of inpatient discharges with indicators for 31 conditions identified in inpatient episodes of care during the 12 months before the inpatient admission

as well as those present at admission⁴⁷ and (ii) the proportion of inpatient discharges with a principal diagnosis or procedure associated with the inpatient discharge best classified as (1) medicine, (2) surgery, (3) cardiorespiratory or cardiovascular, or (4) neurology. For proportion of inpatient discharges, ED visits, or observation stays with follow-up billable service within seven days, we separately controlled for the proportion of qualifying discharges from inpatient settings versus ED settings.

Weighting

We weighted the practice-year observations in the regression models by an *enrollment weight* and a *matching weight*. The enrollment weight equaled the total number of days in the year that assigned beneficiaries were eligible for the analytic population. This ensures that practices with a larger number of assigned beneficiaries contributed more to our estimation than practices with fewer assigned beneficiaries. Beneficiaries were eligible in any month that they were alive and enrolled in Medicare FFS (enrolled in both Part A and Part B and not in a Medicare Advantage plan) with Medicare as the primary payer. The matching weight equaled 1 for all observations in the intervention group. For observations in the comparison group, the matching weight equaled 1 divided by the number of comparison practices in the matched set. For example, for a PCF practice matched to three comparison practices, the observations from those comparison practices received a matching weight of 1/3. This accounts for the fact that not all matched sets had the same number of comparison practices and that many PCF practices were matched to more than one PCF practice.

The final weight we used for frequentist analysis was the product of the enrollment weight and the matching weight. For regressions on *discharge-level* measures, the final weight was the product of the matching weight and the total number of discharges within a practice-year observation. The enrollment weight is unnecessary because these regressions only include observations based on beneficiaries that are already enrolled in Medicare FFS with Medicare as the primary payer during the full month following the discharge. We rescaled the final weight so that the sum of the final weight among comparison practices equaled the sum of the final weight of the PCF practices in the same region, year, and cohort to align with the approach used to assess balance between the PCF and comparison group.

D. Subgroup analyses

The impacts of PCF could differ for different types of practices. Therefore, for selected outcomes, we estimated the effects of PCF by subgroups of different *types of practices based on characteristics defined at baseline*. For subgroup analyses, we include in the regression models interactions of variables denoting subgroup membership with (1) the indicator for PCF versus comparison status, (2) indicators for years relative to the intervention start, and (3) the PCF indicator interacted with year indicators. The rest of the estimation process followed the Sun and Abraham procedure discussed earlier.

Exhibit A.2.6.4 shows the practice-level subgroups for which we estimated differential effects as well as our rationale for including each subgroup. Because there is likely to be substantial correlation among practice characteristics (such as between Medicare Shared Savings Program participation and system

⁴⁷ The 31 condition categories for the Medicare analysis included a range of diagnoses or risk factors, such as severe infection, metastatic cancer/acute leukemia, diabetes mellitus, end-stage liver disease, drug and alcohol disorders, congestive heart failure, chronic obstructive pulmonary disease, ulcers, cardiorespiratory failure or cardiorespiratory shock, acute renal failure, transplants, hip fracture/dislocation, and more. Our approach was based on reviewing standard models in the literature for risk-adjusting the likelihood of readmission.

affiliation), we might not unmask the real drivers of impacts when testing for differential effects for each characteristic separately. Therefore, we included interactions with subgroup indicators for *all* practice subgroup characteristics (but not all beneficiary subgroup characteristics) in a single regression model to disentangle the characteristics that influence program impacts.

Exhibit A.2.6.4. Practice subgroups

Subgroup definitions	Rationale for inclusion
Whether practice participated in CPC+ before PCF	Many PCF practices participated in CPC+ and had substantial prior transformation experience that they might have brought to PCF. These practices might have greater readiness to make changes that could improve outcomes early in the model, but they also might have less room for improvement, potentially resulting in smaller impacts.
Whether practice participated in the Medicare Shared Savings Program at the start of PCF	Participants in the Medicare Shared Savings Program had experience in value-based models that they might have brought to PCF, potentially resulting in smaller but more immediate impacts on outcomes.
Whether practice was affiliated with a hospital-based health system at the start of PCF	Our research indicates PCF participation is often implemented at the system level for many practices, which can help progress change activities through access to additional resources but reduce local practice control over care changes, potentially resulting in more immediate and differential impacts compared with non-affiliated practices.

CPC+ = Comprehensive Primary Care Plus; PCF = Primary Care First.

A.2.7. Details of the hybrid frequentist-Bayesian methodological approach

A. Motivation

We supplement the main impact estimates described above with Bayesian impact estimates. We used a Bayesian approach to estimate impacts on primary and secondary outcomes for the PCF population overall and for select subgroups, as described in more detail in the following sections.

Bayesian models offer two main advantages over the frequentist models used for the main impact analysis. First, Bayesian analysis enables us to draw probabilistic conclusions through statements such as, “There is a greater than 99 percent chance that PCF increased Medicare Part A and B expenditures.” Frequentist analysis does not support statements like this. Instead, the p -value from a frequentist analysis represents the probability that an estimate as extreme as the one observed could have arisen by chance, if the null hypothesis were true—a statement that is hard to express in plain language and often does not align with the research question of interest. Second, Bayesian analysis enables us to borrow strength across related subgroups (that is, learn about a single subgroup from patterns across subgroups), which heightens the precision of impact estimates by subgroup.

The advantages of Bayesian methodology typically come at high computational cost; Bayesian models require much more computational effort and time to estimate than frequentist models do. For PCF, we refined a hybrid frequentist-Bayesian methodology, hereafter called the hybrid Bayesian approach, designed to reduce computation time by building directly on the impact estimates from the primary frequentist analysis.

B. Hybrid Bayesian methodology

Following Lipman et al. (2022), we used a two-stage modeling strategy that paired a frequentist difference-in-differences regression model with a Bayesian meta-regression model. In the first stage, we fit a frequentist difference-in-differences regression to practice-level data, as described in Section A.2.6. This regression analysis adjusted for covariates, applied matching and eligibility weights, used cluster-robust standard errors and, via seemingly unrelated regression (Zellner and Huang 1962), estimated the error covariance between different impact estimates. In the second stage, we fit a Bayesian meta-regression to the subgroup-specific impact estimates and their estimated variance-covariance matrix, separately by outcome. This meta-regression explored variation in impacts between cohorts, across subgroups, and over time.

Compared to the approach of fitting a completely separate Bayesian impact regression, as Mathematica has done for past evaluations, building on frequentist impact estimates substantially improves alignment between the Bayesian and frequentist results while also increasing efficiency. Because Bayesian models are so computationally intensive, it is typically not feasible for them to mirror the primary frequentist approach exactly.⁴⁸ Changes to the regression specification intended to improve tractability could lead to differences in impact estimates. Even with a modified regression specification, Bayesian models take longer to run than frequentist models and are consequently more difficult to refine. Constructing Bayesian models atop the foundations laid by the frequentist approach leads to a more consistent message and a more efficient process.

By adjusting the frequentist impact estimates using a Bayesian meta-regression, we gain the advantages of the Bayesian framework. Namely, we can borrow strength across subgroups to improve the precision and plausibility of the impact estimates, while simultaneously adjusting for multiple comparisons (Gelman et al. 2012). Because frequentist approaches consider each subgroup in isolation, they often produce extreme and highly uncertain estimates. The Bayesian approach of borrowing strength and considering all subgroups simultaneously allows for more precision, without overinterpreting noise in the data. The built-in multiple comparison adjustment also avoids a common double-bind in frequentist analyses, when failing to account for multiple comparisons could lead researchers to identify spurious impacts but correcting for multiple comparisons using traditional strategies could lead researchers to fail to identify true impacts.

Data. We estimated hybrid Bayesian models for the two primary evaluation outcomes, total Medicare Part A and B expenditures and acute hospitalizations, and for the three secondary evaluation outcomes, primary-care-substitutable ED visits, potentially preventable ED visits, and 30-day unplanned hospital readmissions. We estimated impacts for the overall sample and for practice-level subgroups of interest: CPC+ participants, system-affiliated practices, and Medicare Shared Saving Program participants. We estimated impacts for each cohort for each available performance year—that is, Performance Years 1 and 2 for Cohort 1 and Performance Year 1 only for Cohort 2.

⁴⁸ For past evaluations, the most consequential difference was that, to reduce sample size and thereby improve computation, we fit Bayesian regressions at the practice level rather than the beneficiary level. Even with the practice-level approach we have taken for PCF, it is still generally not possible to produce an exact Bayesian analogue of the frequentist specification. For example, frequentist regressions often use cluster-robust standard errors, which are not compatible with a Bayesian approach.

The input data to the hybrid Bayesian meta-regression model were impact estimates and the corresponding variance-covariance matrix for each outcome. We converted all of these inputs to the percentage impact scale to make them comparable both across outcomes and with prior evidence. We rescaled the data by dividing the impact estimate by the estimated counterfactual: that is, the overall average outcome mean in the PCF group in the performance period, minus the impact estimate. Impact estimates represented all available combinations of the outcomes, cohorts, subgroups, and performance years listed in the previous paragraph.

Modeling approach. The hybrid Bayesian model took the form of a meta-regression, in which the response variable was the set of impact estimates from the frequentist difference-in-differences regression models and the predictor variables represent dimensions along which the impact estimates vary: the cohort, subgroup, and performance year. We fit separate meta-regressions for each outcome to guard against anticonservative standard errors, which would result from summarizing across outcomes in a single meta-regression without appropriately accounting for both error and signal correlations among them.⁴⁹

For each outcome, the meta-regression took the following form:

$$y_g \square MVN(\theta_g, V)$$

$$\theta_g = \alpha + \theta_{c[g]}^{Cohort} + \theta_{t[g]}^{Year} + W_g \cdot \theta^{Subgroup} + W_g \cdot \theta_{t[g]}^{SubgroupYr} + W_g \cdot \theta_{c[g]}^{SubgroupChrt} + \theta_g^{Finding}$$

$$\theta_g^{Finding} \square N(0, \sigma_\theta^2)$$

In this model, y_g^k represents the frequentist impact estimate for a certain combination g of subgroup, cohort, and performance year for outcome k . In the equation we drop the superscript k for simplicity, since all models are fit separately by outcome. We assume the frequentist impact estimates have a multivariate normal distribution centered on a vector of true underlying effects θ_g , with error covariance matrix V estimated as part of the frequentist regression analysis. We model the true underlying effects θ_g as a sum of an overall effect α and offsets representing the contributions to the effect of each cohort (θ^{Cohort}), subgroup ($\theta^{Subgroup}$), and performance year (θ^{Year}), and relevant interactions.

When estimating the relationship between each subgroup’s impact estimate and the overall impact estimate, we accounted for sample overlap across subgroups. To do this, we relied on a matrix of weights W that describes the composition of each subgroup in terms of the other subgroups—for example, the proportion of system-affiliated CPC+ participant practices. This approach extends Lipman et al. (2022) by streamlining the set of frequentist impact estimates required as input while capturing

⁴⁹ Error correlation between outcomes arises from sample overlap—that is, because we use the same sample of beneficiaries to estimate impacts on both Medicare Part A and B expenditures and acute hospitalizations. We could account for this type of correlation through the variance-covariance matrix V in the equation. Signal correlation, by contrast, represents the conceptual overlap between two outcomes: the extent to which they represent different dimensions of the same underlying construct. For example, we might think of both Medicare Part A and B expenditures and acute hospitalizations as reflecting a latent patient health outcome. To the extent that a pair of outcomes is correlated in this way, treating them as distinct observations in our meta-regression will lead us to overstate the precision of our estimates and thus reach overconfident conclusions. The literature does not yet offer methods that account for signal correlations across outcomes; indeed, handling them is an active topic of inquiry. To avoid overstating our confidence, we estimate separate meta-regressions for each outcome.

correlations across subgroups and ensuring our impact estimates are coherent across subgroups and the overall sample.

In addition to the main effects of cohort, subgroup, and performance year already described, we also modeled the interactions between subgroup and performance year and between subgroup and cohort. We did not model interactions between cohort and performance year because, with only one performance year of data available for Cohort 2, we lacked adequate data to identify these interactions. For this reason, we also did not include the three-way interaction of subgroup, cohort, and performance year. We did, however, include a finding-level random effect, $\theta_g^{Finding}$, which captures any variation in true effects at the level of the cohort-subgroup-year impact estimate, thereby implicitly incorporating higher-level interactions. We assume this term is normally distributed with variance σ_θ^2 .

To promote model stability, we imposed sum-to-zero constraints on some pairs of parameters—for example, the main effects of each cohort and performance year. These constraints ensure cohort- or performance year-specific impact estimates average to the overall impact estimate, strengthening the logical coherence of the parameter estimates.

Prior distributions. In the Bayesian paradigm, we must also provide prior distributions that describe the likely distributions of each model parameter. When possible, we followed the best practice in the literature of grounding our prior distributions in real-world evidence. To that end, we conducted a literature review of evaluations of health care policy interventions similar to PCF (Exhibit A.2.7.1) and estimated a meta-regression that synthesizes their findings. As in our main analysis, we conducted the meta-analysis on the percentage impact scale, to facilitate comparisons across studies and outcomes.

Exhibit A.2.7.1. Health policy interventions included in the PCF literature review

Intervention name
Comprehensive Primary Care Plus (both tracks)
Comprehensive Primary Care initiative
Multi-Payer Advanced Primary Care Demonstration
Medicare Shared Savings Program
Federally Qualified Health Center Advanced Primary Care Practice Demonstration
ACO Investment Model
Advance Payment ACO Model
Medicare Advantage Value-Based Insurance Design
Million Hearts Cardiovascular Disease Risk Reduction Model
Next Generation ACO Model
Vermont All-Payer Accountable Care Organization Model
Health Care Innovation Awards—Round 1 (selected awardees)
Health Care Innovation Awards—Round 2 (selected awardees)

We used the findings of the meta-regression to inform the priors for several parameters in our analysis of PCF data. First and foremost, we used the meta-regression to inform the prior distribution of the overall intercept term, denoted α . Because the PCF impact analysis is outcome-specific, we used the evidence base meta-regression to derive a different prior distribution for each outcome, reflecting the impacts observed on that outcome in past interventions that are similar to PCF.

When an outcome analyzed for PCF appeared in the meta-regression, we used information about the average impact for this outcome to develop a prior for the intercept term in that regression (Exhibit A.2.7.2). However, the PCF impact analysis includes many more outcomes than we could include in our evidence base. In these cases, we first relied on the average impact estimated for outcomes in the same domain—one of expenditures, hospitalizations, ED visits, and readmissions—and increased the prior’s standard deviation to reflect variation across the effects of specific outcomes within a domain.

Second, we used the meta-regression to inform prior distributions that describe the amount of variation we expect to see across impacts for cohorts, performance years, and subgroups for a single outcome. These parameters are the crux of the Bayesian models, determining how much strength to borrow. But with so few cohorts, performance years, and subgroups included in this report, we lack direct data to estimate them accurately. For this reason, it is especially important to draw on evidence from the literature, both to stabilize our estimates and to maximize the usefulness of the Bayesian approach.

Exhibit A.2.7.2. Prior distributions used in the hybrid Bayesian analysis

Model parameter	Location ^a	Scale ^b
Intercept terms (normally distributed)		
Acute hospitalizations	-0.0030	0.0533
Medicare Part A and B expenditures	0.0152	0.0531
Primary-care-substitutable ED visits	-0.0050	0.0536
Potentially preventable ED visits	-0.0096	0.0532
Proportion of index discharges with unplanned 30-day readmission	-0.0045	0.0534
Variance components (Gamma-distributed)		
Variation across impacts by cohort, performance year, and subgroup	5.2066	0.0055

Note: All prior distributions are on the scale of percentage impacts, so the prior mean of -0.003 for acute hospitalizations represents an expected decrease of 0.3 percent. The standard deviations of roughly 5 percent indicate that 95 percent of interventions are expected to have impacts within +/- 10 percent.

^a For intercept terms, the location parameter is the mean of the distribution; for the variance component, it is the shape of the distribution.

^b For intercept terms, the scale parameter is the standard deviation of the distribution; for the variance component, it is the scale of the distribution.

ED = emergency department.

Model fit. In general, a complex Bayesian model like the one implemented in the hybrid Bayesian approach does not have a solution that can be calculated exactly from an equation. Instead, we simulated from the model using a class of techniques known as Markov Chain Monte Carlo (MCMC), using a recently developed probabilistic programming language called Stan (Stan Development Team 2023). We ran the simulation for 4,000 iterations for each outcome. Even with many iterations under the most current techniques, MCMC provides an approximation to the solution, so it is important to evaluate the simulation’s accuracy and stability. To accomplish this, we checked two common

diagnostics. The first of these is the Gelman-Rubin statistic (Gelman and Rubin 1992), which assesses whether the model has converged. The second is the effective sample size (Geyer 1992), which reflects the degree of uncertainty in our parameter estimates that arises from the simulation. In our analysis, all diagnostics indicated that models had converged and had sufficient effective sample size.

To gauge model fit, we performed posterior predictive checks (Gelman et al. 1996). These checks exploit the notion that a well-fit Bayesian model should describe the process that generated the input data; thus, samples drawn from the posterior, the probability distribution implied by the model, should align with the input data. We took samples from our model and compared the distribution of the samples with the distribution of the frequentist impact estimates we used as inputs. We found that data sets generated from our models aligned well with descriptive statistics—minimum, mean, maximum, and standard deviation—of the input data, by cohort and performance year.

Calculating impact estimates. From the hybrid Bayesian model we obtained an estimate of PCF’s impact on each outcome in each subgroup, cohort, and performance year. Mirroring the frequentist approach, we applied cohort-share weights to aggregate estimates across cohorts in the first performance year; estimates in the second performance year reflect Cohort 1 data only.

C. Interpreting and communicating results

In the results supplement (Appendix B.13), we present posterior means and standard errors for PCF’s impact on the primary and secondary outcomes in the first two performance years, for the overall sample and subgroups of interest in this report. In addition, in Chapter 6, for each outcome we present the probability of a favorable impact in the overall sample in each performance year, that is, the probability that PCF led to a reduction in outcomes in that year.

Appendix B.1. Additional payer data

We fielded a worksheet for PCF payer partners to complete in fall 2022. We received 18 responses out of 22 total fielded surveys. Results are displayed in Exhibits B.1.1 to B.1.7.

Exhibit B.1.1. Partnership details

Question	Response	Count	Percentage
For each of the following lines of business (LOBs), please indicate whether your organization offers the LOB or not, regardless of whether you include it in PCF.			
	Commercial: fully insured	12	67%
	Commercial: self-insured	13	72%
	Health Insurance Marketplace	11	61%
	Medicare Advantage	12	67%
	Medicaid FFS	4	22%
	Medicaid managed care	8	44%
For each LOB your organization offers, please indicate whether you include this LOB in PCF.			
	Commercial: fully insured	10	56%
	Commercial: self-insured	7	39%
	Health Insurance Marketplace	9	50%
	Medicare Advantage	7	39%
	Medicaid FFS	4	22%
	Medicaid Managed Care	5	28%
To what extent did the following reasons influence your organization's decision to partner in PCF?			
The PCF model aligns with our organization's goals to move away from FFS	Did not influence our decision at all	1	6%
	Somewhat influenced our decision	6	33%
	Strongly influenced our decision	11	61%
We are interested in continuing the momentum of primary care transformation from Comprehensive Primary Care Plus (CPC+)	Did not influence our decision at all	5	28%
	Somewhat influenced our decision	4	22%
	Strongly influenced our decision	9	50%
We believe practice transformation will be more successful in partnership with CMS	Did not influence our decision at all	2	11%
	Somewhat influenced our decision	6	33%
	Strongly influenced our decision	10	56%
The chance to partner and potentially align with other payers in the region	Did not influence our decision at all	4	22%
	Somewhat influenced our decision	6	33%
	Strongly influenced our decision	8	44%
For practices that are affiliated with a larger organization, please indicate the level at which PCF payments are predominantly paid.			
	Corporate level	11	79%
	Individual practice level	8	73%

Exhibit B.1.2. Alternative payments

Question	Response	Count	Percentage
Does your organization offer any of the following alternative payment approaches for PCF practices?			
	Full primary care capitation (up-front payment for all primary care services except for key carve-outs)	5	28%
	Partial primary care capitation (up-front payment for a portion of FFS revenue)	7	39%
	Capitation for primary care episodes (up-front payment for primary care-specific episodes, such as urinary tract infection, low back pain)	0	0%
For the following categories, please indicate how many practices receive payments using an alternative payment approach (other than FFS).			
Practices your organization contracts with that are participating in CMS' PCF model	Some	4	22%
	Most	1	6%
	All	5	28%
	Skipped	8	44%
Practices your organization contracts with that are NOT participating in CMS' PCF model	Some	6	33%
	Most	3	17%
	All	1	6%
	Skipped	8	44%
Comparing your organization's alternative approach with the standard FFS approach, which payment model pays more in total payments to practices?			
	Our alternative payment model is calibrated to pay more to practices than standard FFS	7	39%
	Both models are calibrated to pay about the same to practices	2	11%
	Our alternative payment model is calibrated to pay less to practices than standard FFS	1	6%
	Skipped	8	44%
Are the payments your organization makes using an alternative payment approach (other than FFS) risk-adjusted to account for factors such as health status, patient demographics, or patients' prior cost or service use?			
	Yes	10	56%
	Skipped	8	44%

Appendix B.1. Additional payer data

Question	Response	Count	Percentage
Select the factors your organization uses to risk-adjust payments made using an alternative payment approach. Select all that apply.			
<i>Please note: payers were asked to select all applicable options. For this reason, percentage totals in this section will not equal 100.</i>			
	Health status	9	53%
	Patients' demographics	9	53%
	Patients' prior cost or service use	6	43%
Has your organization modified its alternative payment approach (other than FFS) as a result of your partnership in PCF?			
	Yes	5	28%
	No	5	28%
	Skipped	8	44%
Did your organization experience any of the following barriers to offering alternative payments (other than FFS) to PCF practices? Select all that apply.			
<i>Please note: payers were asked to select all applicable options. For this reason, percentage totals in this section will not equal 100.</i>			
	Concerns about practices' readiness to accept capitated payments	10	56%
	Concerns about practices' willingness to accept capitated payments	10	56%
	Concerns about your internal capabilities (such as ability to process or calculate capitated payments)	9	50%
	Too few PCF practices in region	11	61%
	Regulatory challenges	3	17%

Exhibit B.1.3. Payments to reward performance

Question	Response	Count	Percentage
Do you make performance adjustments to any of your payments to PCF practices? <i>Select all that apply.</i>			
<i>Please note: payers were asked to select all applicable options. For this reason, percentage totals in this section will not equal 100.</i>			
	Yes, to our alternative payment approach (other than FFS)	6	43%
	Yes, upside adjustments to practices	14	78%
	Yes, downside adjustments to practices	8	44%
	No	4	33%
Do maximum performance adjustments vary by LOB?			
	Yes	3	17%
	No	11	61%
	Skipped	4	22%
For the following categories, please indicate how many practices are eligible for performance adjustments:			
Practices your organization contracts with that are participating in CMS' PCF model	None	1	6%
	Some	4	22%
	All	8	44%
	Skipped	4	22%
	Missing	1	6%
Practices your organization contracts with that are NOT participating in CMS' PCF model	None	2	11%
	Some	5	28%
	Most	3	17%
	All	4	22%
	Skipped	4	22%
Please indicate which, if any, of the measures your organization uses to adjust payments. <i>Select all that apply.</i>			
<i>Please note: payers were asked to select all applicable options. For this reason, percentage totals in this section will not equal 100.</i>			
	Diabetes Hemoglobin A1c Poor Control	13	77%
	Colorectal Cancer Screening	13	77%
	Controlling High Blood Pressure	13	77%
	Advance Care Planning	3	43%
	Patient Experience of Care	6	60%
	Acute Hospital Utilization	12	77%
	Total Per Capital Cost	7	64%
After joining PCF, did you add or remove measures your organization uses to adjust payments to practices as part of your partnership in PCF? <i>Select all that apply.</i>			
<i>Please note: payers were asked to select all applicable options. For this reason, percentage totals in this section will not equal 100.</i>			
	Yes, we added measures	5	56%
	Yes, we removed measures	5	56%

Exhibit B.1.4. Care management fees

Question	Response	Count	Percentage
Does your organization offer care management fees to PCF practices (separate from capitated payments)?			
	Yes	9	50%
	No	9	50%
For the following categories, please indicate how many practices receive care management fees:			
Practices your organization contracts with that are participating in CMS' PCF model	Some	2	11%
	Most	1	6%
	All	6	33%
	Skipped	9	50%
Practices your organization contracts with that are NOT participating in CMS' PCF model	None	1	6%
	Some	5	28%
	All	3	17%
	Skipped	9	50%
Has your organization modified its approach to providing care management fees as part of your partnership in PCF?			
	Yes	5	28%
	No	13	72%

Exhibit B.1.5. Non-financial supports

Question	Response	Count	Percentage
Does your organization currently share data on cost, service use, or quality with PCF primary care practices?			
	Yes	15	83%
	No	3	17%
What format does your organization use for sharing data feedback with practices? <i>Select all that apply.</i>			
<i>Please note: payers were asked to select all applicable options. For this reason, percentage totals in this section will not equal 100.</i>			
	Static reports (for example, PDFs, Excel worksheets, Word files)	13	81%
	Interactive reports (for example, Excel Power Pivot, Tableau)	6	67%
	Online interactive tool (for example, a business intelligence application)	7	70%
	Claims-based cost measures	10	71%
	Claims-based utilization measures	14	78%
	Cost for primary care specific episodes	4	50%
	Electronic clinical quality data measures (eCQMs)	3	43%
	Patient experience measures	7	64%
	Specialists cost data	7	64%
	Hospital cost data	6	60%
How frequently does your organization provide data feedback?			
	Monthly or more frequently	10	56%
	Quarterly	4	22%
	Skipped	3	17%
	Missing	1	6%
Please indicate the level at which you are reporting metrics in your data feedback. <i>Select all that apply.</i>			
<i>Please note: payers were asked to select all applicable options. For this reason, percentage totals in this section will not equal 100.</i>			
	Patient level	12	80%
	Practitioner level	13	81%
	Practice level	13	81%
	Multisite practice or system level	10	77%
Is your organization currently working with any other payers in your PCF region on data aggregation (for example, combining data from multiple payers into a single platform)?			
	Yes, we planning for data aggregation efforts in our region	2	11%
	Yes, we are part of active data aggregation efforts in our region	3	17%
	No, not at this time	10	56%
	Skipped	3	17%

Appendix B.1. Additional payer data

Question	Response	Count	Percentage
How often does your organization share information related to attribution with practices?			
	Practices receive a list of prospectively attributed members at least quarterly	2	11%
	Practices receive a list of prospectively attributed members at least monthly	12	67%
	Other (specify)	1	6%
	Skipped	3	17%

FFS = fee for service; LOB = line of business.

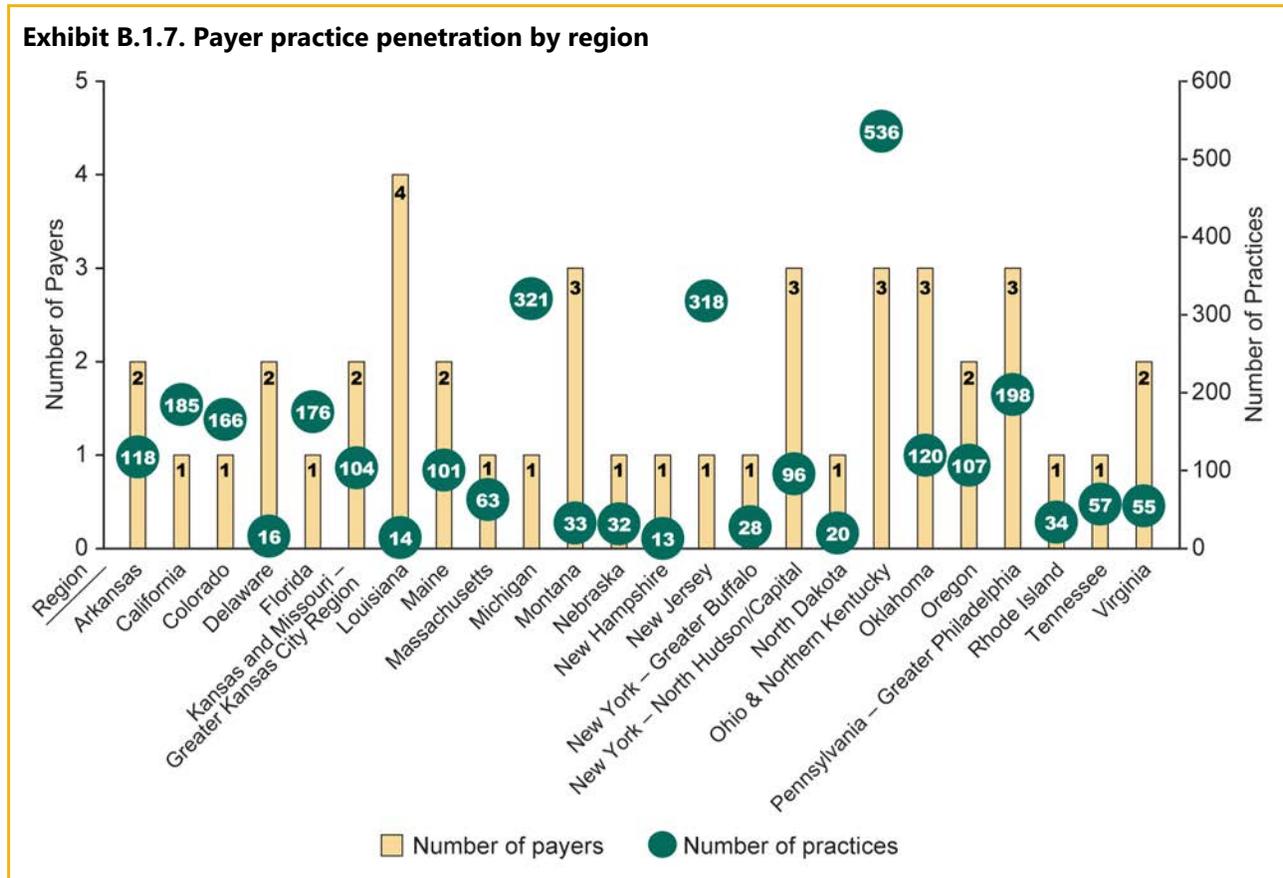
Exhibit B.1.6. List of PCF payer partners, by payer type

Payer type	Line of business	Cohort 1 (2021 start) N = 13	Cohort 2 (2022 start) N = 10
Commercial	<ul style="list-style-type: none"> • Commercial: fully insured • Commercial: self-insured Health Insurance Marketplace • Medicare Advantage • Medicaid managed care 	<ul style="list-style-type: none"> • AIDs Healthcare Foundation^a • Arkansas BCBS • BCBS Kansas City • Highmark BlueShield of Northeastern NY • Community Care • AllCare • Care First BCBS • Humana • Aetna • AmeriHealth Caritas Louisiana • Independent Health Association^a 	<ul style="list-style-type: none"> • Louisiana Healthcare Connections • California Physician's Services (Blue Shield California) • Allegiance Benefit Plan Management • Blue Cross and Blue Shield of Montana • Capital District Physicians Health Plan • MVP Health Care • BCBS Oklahoma • Independence Blue Cross
State Medicaid Programs	<ul style="list-style-type: none"> • Medicaid • Medicaid managed care 	<ul style="list-style-type: none"> • Louisiana Medicaid • Office of MaineCare Services 	<ul style="list-style-type: none"> • Montana Department of Public Health and Human Services (Medicaid)^a • Ohio Department of Medicaid

Source: Mathematica’s analysis of PCF payer partner applications, interviews with payer partners, payer worksheet data, and communications with CMS.

^a Payer withdrew from PCF.

Exhibit B.1.7. shows practices that are participating in PCF and payers that are partnering with CMS, by region. This does not represent contracts between practices and payers.



Appendix B.2. Additional results on practice participation in PCF

B.2.1. Reach of PCF within PCF regions

To better understand the reach of PCF within the 26 regions in which the model was offered, we calculated the percentage of primary care practices that either applied to or joined PCF (in either cohort) in each region. Non-participating applicant practices include practices that were deemed ineligible as well as those that were eligible but subsequently declined (see Appendix A.2 for more details). There was substantial regional variation in the reach of PCF across regions. For example, 40 percent of primary care practices in the Greater Buffalo and 44 percent the Greater Kansas City regions applied or participated in PCF, but less than 6 percent of practices in Louisiana and California did so (see Exhibit B.2.1).

Exhibit B.2.1. Numbers and proportions of primary care practices that participated in and/or applied to PCF in 2021 or 2022, by PCF region

Region Name	Number of PCF practices (Cohorts 1 and 2)	Number of non-participating applicants	Total number of practices	Reach of PCF (% of practices in region that were participants or applicants)
Alaska	0	1	119	1%
Arkansas	118	51	574	29%
California	188	43	5,579	4%
Colorado	163	47	773	27%
Delaware	18	20	208	18%
Florida	174	73	4,492	5%
Greater Buffalo region	32	47	200	40%
Hawaii	46	21	311	22%
Greater Kansas City region	103	6	247	44%
Louisiana	17	25	783	5%
Massachusetts	102	6	1,140	9%
Maine	64	0	250	26%
Michigan	311	92	2,109	19%
Montana	31	14	149	30%
North Dakota	19	6	105	24%
Nebraska	33	36	318	22%
New Hampshire	13	3	237	7%
New Jersey	318	95	1,982	21%
North Hudson-Capital region (NY)	94	38	375	35%

Region Name	Number of PCF practices (Cohorts 1 and 2)	Number of non-participating applicants	Total number of practices	Reach of PCF (% of practices in region that were participants or applicants)
Ohio and Northern Kentucky	519	93	2,214	28%
Oklahoma	122	43	750	22%
Oregon	105	27	594	22%
Greater Philadelphia region	216	60	863	32%
Rhode Island	34	2	221	16%
Tennessee	61	28	1,110	8%
Virginia	66	16	1,382	6%
Total	2,967	893	27,085	14%

Source: Mathematica’s analysis of PCF participation data and OneKey data (2020 and 2021).

Notes: The reach of PCF in a region is calculated as the percentage of primary care practices in the region that either applied to or joined PCF. The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. PCF practices comprise those practices that ever joined the Model, even if they subsequently withdrew. Note that we exclude two PCF practices that were not in PCF regions (Brooklyn and Washington D.C.) which were former Independence at Home practices.

B.2.2. Comparison of PCF regions with non-PCF regions

Approximately half of all primary care practices and half of all Medicare FFS beneficiaries nationwide are located in PCF regions. To understand the representativeness of the 26 regions from which CMS selected to draw PCF practices, we analyzed the characteristics of primary care practices in PCF regions, as well as those of the beneficiaries and communities they serve, in the period prior to PCF (2020 for most measures) and compared these characteristics with those in other regions nationwide (“non-PCF regions”) [Exhibit B.2.2].

Medicare FFS beneficiaries in PCF and non-PCF regions had similar characteristics, such as racial and ethnic composition, Medicare expenditures, and hospitalizations. Median household income is the lone exception, where PCF regions had beneficiaries residing in communities with somewhat higher income (about \$85,000 in PCF regions versus \$80,000 in non-PCF regions). Despite differences in income, PCF and non-PCF regions did not display differences in other socioeconomic indicators, such as unemployment, poverty, and social vulnerability.

Overall, primary care practices in PCF regions were similar to primary care practices in non-PCF regions. For example, primary care practices had similar rates of being independently owned practices— 49 percent of practices in PCF regions were independent compared with 45 percent of practices in non-PCF regions, and similar rates of previous participation in a Medicare Shared Savings Program: 34 percent of practices in PCF regions compared with 39 percent of practices in non-PCF regions.

Exhibit B.2.2. Characteristics of Medicare fee-for-service beneficiaries and primary care practices in PCF and non-PCF regions, before the start of PCF

Characteristic	PCF regions n = 27,085	Non-PCF regions n = 28,116
Beneficiary characteristics		
Non-Hispanic White (%)	83%	84%
Non-Hispanic Black (%)	6%	7%
Hispanic (%)	5%	5%
Total Medicare FFS expenditures (mean)	\$910	\$876
Acute hospitalizations (mean)	238	233
Beneficiary community characteristics (mean)		
Median household income	\$84,589	\$80,085
Poverty rate	12%	12%
Social Vulnerability Index	0.44	0.45
Practice characteristics (%)		
Part of a health system with a hospital	34%	40%
Part of another type of healthcare delivery organization	17%	15%
Independent	49%	45%
Rural location	7%	12%
Participation in the Medicare Shared Savings Program	34%	39%

Source: Mathematica’s analysis of Medicare FFS claims and enrollment data in 2020, OneKey data (2020 and 2021) and supplemental data (see Appendix A.2 for more details on data sources).

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Practice characteristics are measured in 2020, with the exception of PCF Cohort 2 practices where data are from 2021. For beneficiary characteristics, data are from 2020 for all practices. Race and ethnicity come from the MBISG probabilities (see Appendix B.3 for more information on this approach).

MBISG = Medicare Bayesian Improved Surname Geocoding; n = number of practices; PCF = Primary Care First.

B.2.3. Additional characteristics of primary care practices in PCF regions.

In Exhibits B.2.3 to B.2.10, we present additional characteristics of practices in PCF regions not shown in Chapter 2, including stratifying non-participating applicants based on whether they were ineligible (versus eligible and declined participation), presenting characteristics by PCF risk group, and stratifying PCF practices based on previous CPC+ participation.

Exhibit B.2.3. Characteristics of primary care practices in PCF regions, before the start of PCF

Characteristic	PCF practices		Practices not participating in PCF		
	Cohort 1 n = 822	Cohort 2 n = 2,145	Applicants that were eligible but declined n = 505	Applicants that were ineligible n = 388	Non- applicants n = 23,225
Practice size					
Number of practitioners (mean)	7	9	6	6	6
Small (1 or 2 practitioners) (%)	23%	20%	29%	46%	47%
Medium (3 to 9 practitioners) (%)	41%	34%	34%	31%	28%
Large (10 or more practitioners) (%)	36%	46%	37%	23%	26%
Practice specialty					
Multispecialty (%)	38%	36%	29%	32%	36%
Number of primary care practitioners (mean)	4	5	3	3	2
Practice affiliation (%)					
Part of a health system with a hospital	71%	70%	45%	34%	29%
Part of another type of health care delivery organization	13%	13%	22%	15%	17%
Independent	16%	17%	33%	51%	54%
Practices with select transformation experience (%)					
PCMH with NCQA recognition	21%	28%	32%	17%	10%
Participation in Medicare Shared Savings Program	55%	49%	53%	47%	31%
Participation in CPC+	0%	59%	54%	19%	3%
Participation in an advanced APM	68%	94%	94%	85%	69%

Source: Mathematica's analysis of OneKey data (2020 and 2021) and supplemental data (see Appendix A.2 for more details on data sources).

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Characteristics are measured before the start of PCF for all practices (data are from 2020, with the exception of PCF Cohort 2 practices where data are from 2021). Percentages might not sum to 100 because of rounding.

CPC+ = Comprehensive Primary Care Plus; n = number of practices; NCQA = National Committee for Quality Assurance; PCF = Primary Care First; PCMH = Patient-Centered Medical Home; APM = Alternative Payment Model.

Exhibit B.2.4. Community characteristics of the practice and beneficiaries in PCF regions, before the start of PCF

Characteristic	PCF practices		Practices not participating in PCF	
	Cohort 1 n = 822	Cohort 2 n = 2,145	Non-participating applicants n = 893	Non-applicants n = 23,225
Beneficiary community characteristics (mean)				
Median household income	\$86,713	\$86,422	\$80,731	\$84,263
Poverty rate	11%	11%	12%	12%
Unemployment rate	5%	5%	5%	5%
Practice community characteristics (mean)				
Medicare Advantage penetration rate	43%	44%	40%	42%
Centers for Medicare & Medicaid Services price index	1.09	1.07	1.06	1.10

Source: Mathematica’s analysis of supplemental data (see Appendix A.2).

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Characteristics are measured before the start of PCF for all practices. Household income and poverty data are sourced from the ACS 5-yr sample from 2019; Social Vulnerability Index is sourced from the Agency for Toxic Substances and Disease Registry (ATSDR) from 2018.

CPC+ = Comprehensive Primary Care Plus; n = number of practices; NCQA = National Committee for Quality Assurance; PCF = Primary Care First; PCMH = Patient-Centered Medical Home.

Exhibit B.2.5. Characteristics of Medicare fee-for-service beneficiaries in PCF regions, 2020

Characteristic	PCF practices		Practices not participating in PCF		
	Cohort 1 n = 822	Cohort 2 n = 2,145	Applicants that were eligible but declined n = 505	Applicants that were ineligible n = 388	Non- applicants n = 23,225
Age categories (%)					
18 to 64	13%	9%	9%	11%	10%
65 to 74	49%	51%	51%	47%	49%
75 to 84	28%	29%	29%	30%	30%
85 or older	10%	11%	11%	12%	11%
Sex (%)					
Female	58%	58%	58%	58%	58%
Race (%)					
White	84%	87%	88%	81%	81%
Black	6%	5%	4%	8%	6%
Asian	3%	3%	3%	4%	4%
Hispanic	4%	3%	3%	5%	6%
American Indian/Alaska Native	0%	0%	0%	0%	1%
Multi-racial/Other/unknown	2%	2%	2%	2%	2%
Poverty indicators					
Partial or full dual eligibility (%)	13%	10%	10%	15%	14%
Part D low-income subsidy (%)	15%	12%	12%	17%	16%
Number of Hierarchical Condition Categories (%)					
0	25%	27%	27%	24%	26%
1 or 2	42%	42%	42%	42%	42%
3 or 4	19%	18%	19%	20%	19%
5 or more	14%	12%	12%	14%	13%
Medicare FFS expenditures (\$ per beneficiary per month)					
Total Medicare expenditures	\$919	\$859	\$828	\$955	\$924
Expenditures for acute inpatient care	\$297	\$279	\$256	\$317	\$302
Service use (annualized per 1,000 beneficiaries)					
Acute hospitalizations (short-stay acute care and critical access hospitals)	240	231	221	270	239
Outpatient ED visits	373	358	353	388	369
Primary care substitutable ED visits	131	123	122	137	129
Primary care visits in all settings	13,295	12,207	12,091	14,131	13,630

Appendix B.2. Additional results on practice participation in PCF

Characteristic	PCF practices		Practices not participating in PCF		
	Cohort 1 n = 822	Cohort 2 n = 2,145	Applicants that were eligible but declined n = 505	Applicants that were ineligible n = 388	Non- applicants n = 23,225
Beneficiary community characteristics (mean)					
Median household income	\$86,713	\$86,422	\$80,562	\$81,120	\$84,263
Poverty rate	11%	11%	12%	12%	12%
Unemployment rate	5%	5%	5%	5%	5%
Practice community characteristics (mean)					
Medicare Advantage penetration rate	43%	44%	40%	41%	41%
Centers for Medicare & Medicaid Services price index	1.10	1.07	1.05	1.07	1.08

Source: Mathematica's analysis of Medicare FFS claims and enrollment data in 2020.

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Characteristics are measured before the start of PCF (2020 for all beneficiaries). Race and ethnicity come from the MBISG probabilities (see Appendix B.3 for further context on the MBISG approach). Percentages might not sum to 100 because of rounding.

ED = emergency department; FFS = fee for service; MBISG = Medicare Bayesian Improved Surname Geocoding; n = number of practices; PCF = Primary Care First.

Exhibit B.2.6. Characteristics of Cohort 1 PCF practices by risk group, in 2020

Characteristic	Cohort 1 total n = 822	Risk group			
		1 n = 741	2 n = 53	3 n = 21	4 n = 7
Practice size					
Number of practitioners (mean)	7	7	7	9	9
Small (1 or 2 practitioners) (%)	23%	23%	23%	29%	14%
Medium (3 to 9 practitioners) (%)	41%	43%	28%	24%	0%
Large (10 or more practitioners) (%)	36%	34%	49%	48%	86%
Practice type					
Multispecialty (%)	38%	37%	53%	43%	43%
Number of primary care practitioners (mean)	4	4	4	3	1
Practice affiliation (%)					
Part of a health system with a hospital	71%	74%	42%	33%	14%
Part of another type of healthcare delivery organization	13%	12%	21%	24%	29%
Independent	16%	14%	38%	43%	57%
Practices with select transformation experience (%)					
PCMH with NCQA accreditation	21%	21%	19%	0%	0%
Participation in the Medicare Shared Savings Program	55%	56%	60%	38%	14%
Participation in CPC+	0%	1%	0%	0%	0%
Participation in an advanced APM	68%	67%	72%	71%	71%
PCF region (practice counts)					
Alaska	0	0	0	0	0
Arkansas	17	15	1	1	0
California	95	82	10	1	2
Colorado	12	11	0	0	1
Delaware	14	11	2	1	0
Florida	101	85	11	4	1
Greater Buffalo region	12	11	1	0	0
Greater Kansas City region	8	7	1	0	0
Greater Philadelphia region	60	54	4	1	1
Hawaii	5	2	2	1	0
Louisiana	6	3	0	2	1
Maine	45	44	1	0	0
Massachusetts	59	57	1	1	0
Michigan	37	31	1	4	1

Appendix B.2. Additional results on practice participation in PCF

Characteristic	Cohort 1 total n = 822	Risk group			
		1 n = 741	2 n = 53	3 n = 21	4 n = 7
Montana	0	0	0	0	0
Nebraska	13	11	2	0	0
New Hampshire	5	5	0	0	0
New Jersey	78	71	4	3	0
North Dakota	0	0	0	0	0
North Hudson-Capital region (NY)	17	13	4	0	0
Ohio and Northern Kentucky	99	97	2	0	0
Oklahoma	32	30	1	1	0
Oregon	15	15	0	0	0
Rhode Island	0	0	0	0	0
Tennessee	37	36	1	0	0
Virginia	55	50	4	1	0

Source: Mathematica's analysis of OneKey data (2020) and supplemental data (see Appendix A.2 for more details on data sources).

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. We excluded the two Cohort 1 PCF practices not in PCF regions (in Washington, D.C. and Brooklyn, NY).

Characteristics are measured in 2020 for all practices. Percentages might not sum to 100 because of rounding.

CPC+ = Comprehensive Primary Care Plus; n = number of practices; NCQA = National Committee for Quality Assurance; PCF = Primary Care First; PCMH = Patient-Centered Medical Home; APM = Alternative Payment Model.

Exhibit B.2.7. Characteristics of Cohort 2 PCF practices by risk group, 2021

Characteristic	Cohort 2 total n = 2,145	Risk group			
		1 n = 1,940	2 n = 170	3 n = 26	4 n = 9
Practice size					
Number of practitioners (mean)	9	8	8	11	20
Small (1 or 2 practitioners) (%)	20%	18%	36%	15%	0%
Medium (3 to 9 practitioners) (%)	34%	35%	26%	31%	44%
Large (10 or more practitioners) (%)	46%	47%	38%	54%	56%
Practice type					
Multispecialty (%)	36%	36%	32%	58%	89%
Number of primary care practitioners (mean)	5	5	4	5	4
Number of beneficiaries					
Number of Medicare beneficiaries (mean)	671	691	498	427	389
Practice affiliation (%)					
Part of a health system with a hospital	70%	72%	58%	38%	11%
Part of another type of healthcare delivery organization	13%	13%	19%	19%	22%
Independent	17%	16%	23%	42%	67%
Practices with select transformation experience (%)					
PCMH with NCQA accreditation	28%	28%	23%	19%	0%
Participation in the Medicare Shared Savings Program	49%	48%	61%	50%	44%
Participation in CPC+	59%	61%	48%	38%	0%
Participation in an advanced APM	94%	94%	94%	100%	100%
PCF region (practice counts)					
Alaska	0	0	0	0	0
Arkansas	101	92	9	0	0
California	93	74	15	4	0
Colorado	151	145	5	1	0
Delaware	4	0	4	0	0
Florida	73	57	12	3	1
Greater Buffalo region	20	18	2	0	0
Greater Kansas City region	95	93	2	0	0
Greater Philadelphia region	156	141	12	2	1
Hawaii	41	41	0	0	0
Louisiana	11	9	1	1	0
Maine	19	18	1	0	0

Appendix B.2. Additional results on practice participation in PCF

Characteristic	Cohort 2 total n = 2,145	Risk group			
		1 n = 1,940	2 n = 170	3 n = 26	4 n = 9
Massachusetts	43	37	5	1	0
Michigan	274	239	30	3	2
Montana	31	31	0	0	0
Nebraska	20	20	0	0	0
New Hampshire	8	8	0	0	0
New Jersey	240	207	22	7	4
North Dakota	19	19	0	0	0
North Hudson-Capital region (NY)	77	69	8	0	0
Ohio and Northern Kentucky	420	390	26	3	1
Oklahoma	90	80	9	1	0
Oregon	90	90	0	0	0
Rhode Island	34	32	2	0	0
Tennessee	24	20	4	0	0
Virginia	11	10	1	0	0

Source: Mathematica's analysis of OneKey data (2021) and supplemental data (see Appendix A.2 for more details on data sources).

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Characteristics are measured before Cohort 2 practices started the PCF Model (data are from 2021, with the exception of prior transformation variables where data are from 2020).

CPC+ = Comprehensive Primary Care Plus; n = number of practices; NCQA = National Committee for Quality Assurance; PCF = Primary Care First; PCMH = Patient-Centered Medical Home; APM = Alternative Payment Model.

Exhibit B.2.8. Characteristics of Medicare fee-for-service beneficiaries assigned to Cohort 1 PCF practices by risk group, in 2020

Characteristic	Cohort 1 total n = 822	Risk group			
		1 n = 741	2 n = 53	3 n = 21	4 n = 7
Age categories (%)					
18 to 64	13%	13%	12%	9%	12%
65 to 74	49%	50%	39%	22%	21%
75 to 84	28%	28%	32%	35%	31%
85 or older	10%	9%	16%	34%	36%
Sex (%)					
Female	58%	58%	61%	65%	66%
Race (%)					
White	84%	85%	74%	79%	78%
Black	6%	6%	12%	6%	8%
Asian	3%	3%	7%	9%	5%
Hispanic	4%	4%	5%	4%	6%
Other/unknown	2%	2%	2%	2%	2%
Poverty indicators					
Partial or full dual eligibility (%)	13%	12%	19%	26%	40%
Part D low-income subsidy (%)	15%	14%	21%	28%	42%
Number of Hierarchical Condition Categories (%)					
0	25%	26%	13%	8%	4%
1 or 2	42%	42%	38%	31%	21%
3 or 4	19%	19%	26%	29%	29%
5 or more	14%	13%	23%	31%	46%
Chronic conditions/Frailty (%)					
Alzheimer's disease and related dementia	5%	5%	10%	26%	42%
Cancer	15%	15%	17%	16%	11%
Chronic obstructive pulmonary disease	12%	12%	15%	17%	26%
Chronic kidney disease	9%	9%	14%	14%	12%
Congestive heart failure	12%	11%	16%	22%	36%
Diabetes	26%	25%	35%	31%	34%
Frailty (%)	34%	33%	43%	59%	74%
Any durable medical equipment use (%)	29%	29%	33%	41%	47%

Appendix B.2. Additional results on practice participation in PCF

Characteristic	Cohort 1 total n = 822	Risk group			
		1 n = 741	2 n = 53	3 n = 21	4 n = 7
Medicare FFS expenditures (\$ per beneficiary per month)					
Total Medicare expenditures	\$919	\$890	\$1,157	\$1,626	\$2,421
Expenditures for acute inpatient care	\$297	\$288	\$367	\$500	\$741
Service use (annualized per 1,000 beneficiaries)					
Acute hospitalizations (short-stay acute care and critical access hospitals)	240	233	298	424	602
Outpatient ED visits	373	367	421	519	605
Primary care substitutable ED visits	131	129	149	165	186
Primary care visits in all settings	13,295	12,852	17,837	21,829	29,065

Source: Mathematica's analysis of Medicare FFS claims and enrollment data in 2020.

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Characteristics are measured in 2020 for all practices. Race and ethnicity come from the MBISG probabilities (see Appendix B.3 for further context on the MBISG approach). Percentages might not sum to 100 because of rounding.

ED = emergency department; FFS = fee for service; MBISG = Medicare Bayesian Improved Surname Geocoding; n = number of practices; PCF = Primary Care First.

Exhibit B.2.9. Characteristics of Medicare fee-for-service beneficiaries assigned to Cohort 2 PCF practices by risk group, in 2020

Characteristic	Cohort 2 total n = 2,145	Risk group			
		1 n = 1,940	2 n = 170	3 n = 26	4 n = 9
Age categories (%)					
18 to 64	9%	9%	14%	11%	15%
65 to 74	51%	52%	43%	29%	19%
75 to 84	29%	29%	30%	34%	26%
85 or older	11%	10%	14%	27%	40%
Sex (%)					
Female	58%	58%	60%	64%	70%
Race (%)					
White	87%	88%	78%	76%	77%
Black	5%	4%	11%	6%	13%
Asian	3%	3%	4%	10%	2%
Hispanic	3%	3%	4%	5%	6%
Other/unknown	0%	0%	0%	0%	0%
Poverty indicators					
Partial or full dual eligibility (%)	10%	9%	19%	27%	31%
Part D low-income subsidy (%)	12%	11%	22%	29%	35%
Number of Hierarchical Condition Categories (%)					
0	27%	28%	18%	9%	3%
1 or 2	42%	43%	40%	32%	23%
3 or 4	18%	18%	24%	29%	28%
5 or more	12%	11%	19%	30%	45%
Chronic conditions/Frailty (%)					
Alzheimer's disease and related dementia	4%	4%	7%	16%	37%
Cancer	14%	14%	15%	16%	10%
Chronic obstructive pulmonary disease	11%	11%	16%	20%	27%
Chronic kidney disease	9%	8%	13%	14%	9%
Congestive heart failure	11%	10%	15%	23%	34%
Diabetes	25%	24%	31%	31%	34%
Frailty (%)	34%	33%	41%	58%	75%
Any durable medical equipment use (%)	29%	29%	33%	35%	54%

Appendix B.2. Additional results on practice participation in PCF

Characteristic	Cohort 2 total n = 2,145	Risk group			
		1 n = 1,940	2 n = 170	3 n = 26	4 n = 9
Medicare FFS expenditures (\$ per beneficiary per month)					
Total Medicare expenditures	\$859	\$837	\$1,071	\$1,360	\$2,596
Expenditures for acute inpatient care	\$279	\$270	\$375	\$443	\$907
Service use (annualized per 1,000 beneficiaries)					
Acute hospitalizations (short-stay acute care and critical access hospitals)	231	224	309	339	709
Outpatient ED visits	358	351	444	452	509
Primary care substitutable ED visits	123	121	154	150	151
Primary care visits in all settings	12,207	11,866	15,608	19,849	36,132

Source: Mathematica's analysis of Medicare FFS claims and enrollment data in 2020.

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Characteristics are measured in 2020 for all practices. Race and ethnicity come from the MBISG probabilities (see Appendix B.3 for further context on the MBISG approach). Percentages might not sum to 100 because of rounding.

ED = emergency department; FFS = fee for service; MBISG = Medicare Bayesian Improved Surname Geocoding; n = number of practices; PCF = Primary Care First.

Exhibit B.2.10. Characteristics of PCF practices (Cohorts 1 and 2) and their assigned Medicare fee-for-service beneficiaries by prior CPC+ participation, before the start of PCF

Characteristic	PCF practices	
	CPC+ participant n = 1,275	Other practices n = 1,692
Practice characteristics		
Number of practitioners (mean)	9	8
Independent	15%	18%
Beneficiary characteristics		
Age		
18 to 64	9%	11%
65 to 74	52%	49%
75 to 84	29%	29%
85 or older	10%	11%
Sex (%)		
Female	58%	58%
Race (%)		
White	88%	85%
Black	5%	6%
Asian	3%	3%
Hispanic	3%	4%
Multiracial/other/unknown	2%	2%
Poverty indicators		
Partial or full dual eligibility (%)	9%	12%
Part D low-income subsidy (%)	11%	14%
Number of Hierarchical Condition Categories (%)		
0	27%	26%
1 or 2	43%	42%
3 or 4	18%	19%
5 or more	12%	13%
Medicare FFS expenditures (\$ per beneficiary per month)		
Total Medicare expenditures	\$841	\$908
Expenditures for acute inpatient care	\$270	\$297
Service use (annualized per 1,000 beneficiaries)		
Acute hospitalizations (short-stay acute care and critical access hospitals)	227	239
Outpatient ED visits	352	371
Primary care substitutable ED visits	121	129
Primary care visits in all settings	11,998	12,971

Source: Mathematica's analysis of Medicare FFS claims and enrollment data in 2020, OneKey data (2020 and 2021) and supplemental data (see Appendix A.2 for more details on data sources).

Notes: The analytic sample includes all PCF practices (cohorts 1 and 2) that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Practice characteristics are measured in 2020, with the exception of PCF Cohort 2 practices where data are from 2021. For beneficiary characteristics, data are from 2020 for all practices. Race comes from the MBISG probabilities (see Appendix B.3 for more information on this approach). CPC+ participants comprise practices that ever participated in CPC+. Percentages might not sum to 100 because of rounding.

ED = emergency department; FFS = fee for service; MBISG = Medicare Bayesian Improved Surname Geocoding; n = number of practices; PCF = Primary Care First.

B.2.4. Characteristics of withdrawn PCF practices.

In Exhibits B.2.11 and B.2.12, we compare the characteristics of PCF practices that withdrew from the model by the end of 2022 with those of practices that remained in the PCF Model. Withdrawn practices were smaller, less likely to have prior transformation, and more likely to be independent than those that remained in the model (Exhibit B.2.11). Withdrawn practices also served more vulnerable beneficiaries, such as those that were dually eligible for Medicare and Medicaid, Part D low-income subsidy eligible, and non-White (Exhibit B.2.12).

In Exhibit B.2.13 and B.2.14, we show the rates of and reasons for withdraws, stratified by PCF risk group. A larger share of practices in the highest risk groups (groups 3 and 4) withdrew compared with practices in the lower risk groups (Exhibit B.2.13). Practices in the higher risk groups had higher proportions of withdraws due to joining ACO REACH and not meeting the minimum beneficiary threshold but lower proportions of withdraw due to concerns with the PAA (Exhibit B.2.14).

Exhibit B.2.11. Practice characteristics of PCF practices that withdrew from the model compared to those that did not, before the start of PCF

Characteristic	Overall		Cohort 1		Cohort 2	
	Withdrawn n = 422	Not withdrawn n = 2,545	Withdrawn n = 212	Not withdrawn n = 610	Withdrawn n = 210	Not withdrawn n = 1,935
Practice size						
Number of practitioners (mean)	6	9	5	8	6	9
Small (1 or 2 practitioners) (%)	36%	18%	35%	19%	38%	18%
Medium (3 to 9 practitioners) (%)	37%	36%	42%	41%	33%	34%
Large (10 or more practitioners) (%)	26%	46%	23%	40%	29%	48%
Practice type						
Multispecialty (%)	28%	38%	31%	41%	25%	37%
Number of primary care practitioners (mean)	3	5	3	4	3	5
Number of beneficiaries						
Number of Medicare beneficiaries (mean)	457	681	398	658	517	688
Practice affiliation (%)						
Part of a health system with a hospital	44%	75%	50%	78%	39%	73%
Part of another type of healthcare delivery organization	28%	11%	28%	8%	28%	12%
Independent	28%	15%	23%	14%	33%	15%
Practices with select transformation experience (%)						
PCMH with NCQA accreditation	23%	26%	17%	22%	30%	27%
Participation in the Medicare Shared Savings Program	41%	52%	49%	58%	33%	50%
Participation in CPC+	23%	46%	0%	0%	46%	61%
Participation in an advanced APM	79%	88%	69%	67%	89%	94%

Source: Mathematica’s analysis of OneKey data (2020 and 2021) and supplemental data (see Appendix A.2 for more details on data sources).

Notes: The analytic sample includes all PCF practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Withdrawn practices comprise practices that exited PCF in 2021 or 2022. Practice characteristics are measured in 2020 for Cohort 1 practices and in 2021 for Cohort 2 practices. Percentages might not sum to 100 because of rounding.

CPC+ = Comprehensive Primary Care Plus; n = number of practices; NCQA = National Committee for Quality Assurance; PCF = Primary Care First; PCMH = Patient-Centered Medical Home; APM = Alternative Payment Model.

Exhibit B.2.12. Beneficiary characteristics of PCF practices that withdrew from the model compared to those that did not

Characteristic	Overall		Cohort 1		Cohort 2	
	Withdrawn n = 422	Not withdrawn n = 2,545	Withdrawn n = 212	Not withdrawn n = 610	Withdrawn n = 210	Not withdrawn n = 1,935
Age categories (%)						
18 to 64	12%	10%	14%	13%	11%	9%
65 to 74	48%	51%	48%	49%	49%	51%
75 to 84	29%	29%	29%	28%	29%	29%
85 or older	11%	10%	10%	10%	11%	11%
Sex (%)						
Female	58%	58%	58%	58%	58%	58%
Race (%)						
White	86%	87%	84%	85%	88%	87%
Black	6%	5%	8%	6%	5%	5%
Asian	2%	3%	2%	3%	2%	3%
Hispanic	3%	3%	4%	4%	3%	3%
Multiracial/other/unknown	2%	2%	2%	2%	2%	2%
Poverty indicators						
Partial or full dual eligibility (%)	13%	10%	13%	13%	12%	10%
Part D low-income subsidy (%)	15%	12%	15%	15%	15%	12%
Number of Hierarchical Condition Categories (%)						
0	25%	27%	24%	25%	25%	27%
1 or 2	42%	42%	42%	42%	42%	42%
3 or 4	19%	19%	20%	19%	19%	18%
5 or more	13%	12%	14%	14%	13%	12%

Appendix B.2. Additional results on practice participation in PCF

Characteristic	Overall		Cohort 1		Cohort 2	
	Withdrawn n = 422	Not withdrawn n = 2,545	Withdrawn n = 212	Not withdrawn n = 610	Withdrawn n = 210	Not withdrawn n = 1,935
Medicare FFS expenditures (\$ per beneficiary per month)						
Total Medicare expenditures	\$894	\$872	\$896	\$924	\$893	\$856
Expenditures for acute inpatient care	\$293	\$282	\$295	\$297	\$292	\$278
Service use (annualized per 1,000 beneficiaries)						
Acute hospitalizations (short-stay acute care and critical access hospitals)	250	231	245	239	254	229
Outpatient ED visits	381	359	383	371	379	356
Primary care substitutable ED visits	131	124	133	131	130	123
Primary care visits in all settings	13,226	12,399	13,507	13,251	13,008	12,142

Source: Mathematica's analysis of Medicare FFS claims and enrollment data in 2020.

Notes: The analytic sample includes all PCF practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Withdrawn practices comprise practices that exited PCF in 2021 or 2022. Characteristics are measured in 2020. Race comes from the MBISG probabilities (see Appendix B.3 for more information on this approach).

ED = emergency department; FFS = fee for service; MBISG = Medicare Bayesian Improved Surname Geocoding; n = number of practices; PCF = Primary Care First.

Exhibit B.2.13. Counts and rates of practices that withdrew from the model, by risk group

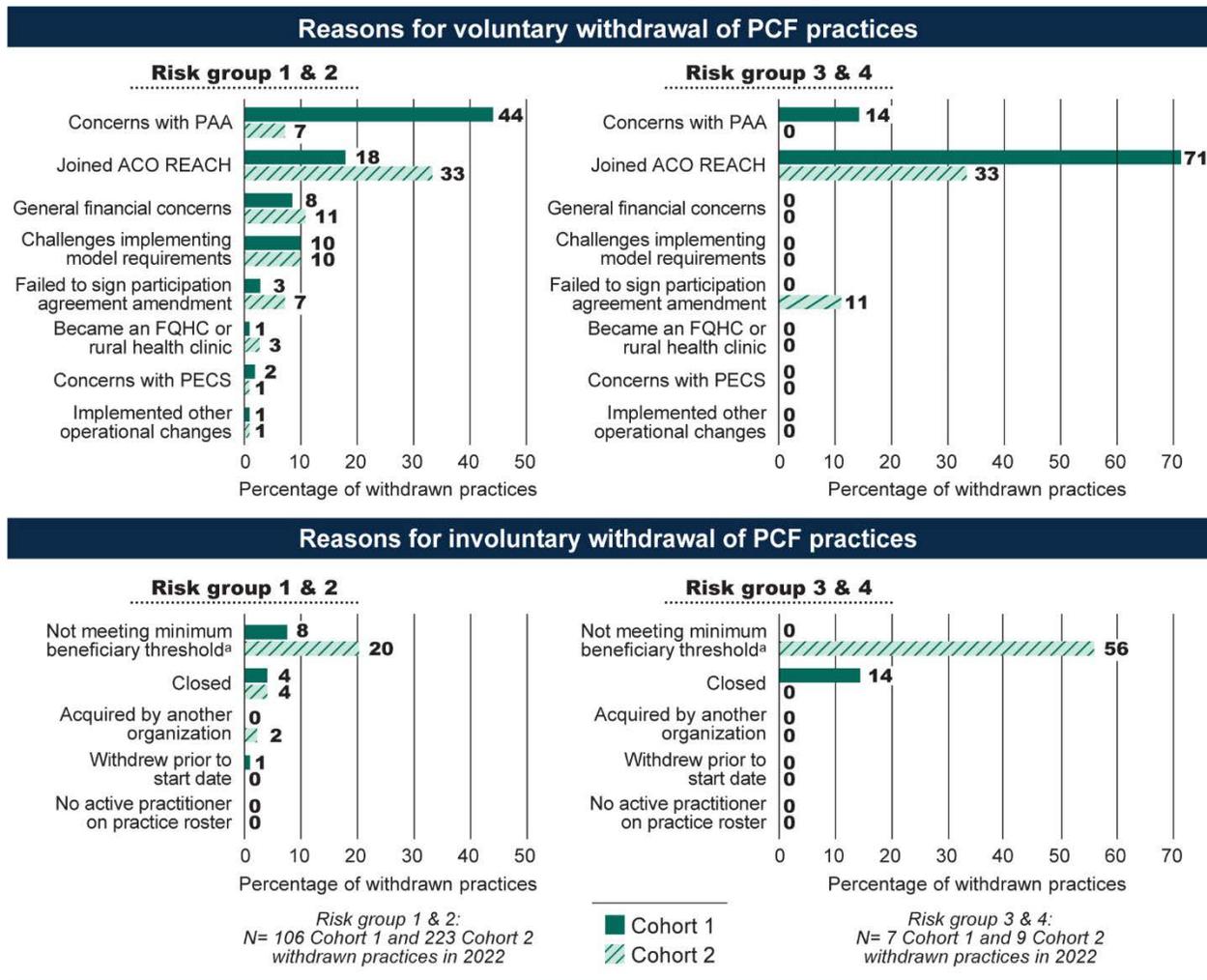
Risk group	Overall n = 2,967		Cohort 1 n = 822		Cohort 2 n = 2,145	
	Withdrawn n = 422	Not withdrawn n = 2,545	Withdrawn n = 212	Not withdrawn n = 610	Withdrawn n = 210	Not withdrawn n = 1,935
Practice counts (% of risk group)						
Risk group 1	360 (13%)	2321 (87%)	184 (25%)	557 (75%)	176 (9%)	1764 (91%)
Risk group 2	45 (20%)	178 (80%)	18 (34%)	35 (66%)	27 (16%)	143 (84%)
Risk group 3	11 (23%)	36 (77%)	7 (33%)	14 (67%)	4 (15%)	22 (85%)
Risk group 4	6 (38%)	10 (63%)	3 (43%)	4 (57%)	3 (33%)	6 (67%)

Source: Mathematica’s analysis of PCF participation data in 2021 and 2022.

Notes: The analytic sample includes all practices that existed in 2020 with at least one Medicare beneficiary and at least one primary care practitioner. Withdrawn practices comprise practices that exited PCF in 2021 or 2022. This table shows the number of practices that withdrew (or remained) in the model. In parentheses, we show the percentage of practices in the risk group that withdrew (or remained) in the PCF model.

PCF = Primary Care First.

Exhibit B.2.14. Reasons for practice withdrawals in 2022, by PCF risk group



Source: Mathematica’s analysis of PCF Model Practice Roster provided by the implementation contractor, January 2023.

Notes: There were a total of 106 Cohort 1 and 223 Cohort 2 withdrawn practices that we analyzed from the roster data that were in risk group 1 or 2. There were a total of 7 Cohort 1 and 9 Cohort 2 withdrawn practices that we analyzed from the roster data that were in risk group 3 or 4.

^a Some of the practices not meeting the minimum beneficiary threshold might have also withdrawn because of non-compliance with the participation agreement.

ACO REACH = Accountable Care Organization Realizing Equity, Access, and Community Health; FQHC = Federally Qualified Health Center; PAA = payment accuracy adjustment; PCF = Primary Care First; PECS = Patient Experience of Care Survey.

Appendix B.3. Assessment of baseline health disparities in PCF practices

B.3.1. Overview of approach

Our objective in this analysis was to characterize disparities in acute care use across Medicare beneficiaries at PCF practices before the start of the model. This assessment focused on five key beneficiary characteristics:

- **Race and ethnicity:** Non-Hispanic Black, Hispanic, and non-Hispanic Asian or Pacific Islander (API) versus non-Hispanic White.⁵⁰
- **Dual eligibility for Medicare and Medicaid:** Dually eligible versus non-dually eligible.
- **Low-Income Subsidy (LIS) for Medicare Part D coverage:** LIS eligible Medicare Part D beneficiaries versus non-LIS eligible Medicare Part D beneficiaries.
- **Social vulnerability of residence area, based on the Social Vulnerability Index (SVI):** The SVI of a census tract is a measure from 0 to 1 meant to capture the amount of support a community will need during a public health emergency based on socioeconomic status, household characteristics, racial and ethnic composition, and housing type and transportation. We group SVI into four strata, (0 to 0.25, 0.25 to 0.5, 0.5 to 0.75, and 0.75 to 1) and treat the lowest social vulnerability stratum (0 to 0.25) as the reference group.
- **Rurality of residence area:** Rural versus non-rural zip code, based on classifications from the Health Resources and Services Administration.

Because health disparities that we might observe during the onset of the COVID-19 pandemic might not generalize to the intervention period, we excluded the year 2020 from this baseline analysis (that is, the Cohort 1 and Cohort 2 analyses used data from 2019 and 2021, respectively). We estimated disparities using linear regression with cluster-robust standard errors to account for idiosyncratic impact of individual practices on beneficiaries' outcomes. In our analyses of racial and ethnic disparities, we adjusted for beneficiaries' age and sex. In all other analyses, we adjusted for age, sex, and race and ethnicity. All of the subgroups had at least 10,000 beneficiaries.

Because race and ethnicity information from the Medicare enrollment database has poor agreement with self-reported identity, we used imputed race and ethnicity probabilities from the Medicare Bayesian Improved Surname Geocoding (MBISG) approach (Haas et al. 2019). MBISG uses surnames, residence area, and other information to infer beneficiaries' likely race and ethnicity. In this analysis, we used MBISG probabilities to run multiple imputation, whereby the analysis is run many times with different probabilistically imputed race and ethnicity labels and the output is aggregated into a single result. A key benefit of this multiple imputation approach is that it computes more conservative standard errors and confidence intervals that better account for the fact that the race and ethnicity information is imputed rather than self-reported. We used 20 rounds of imputation for this analysis.

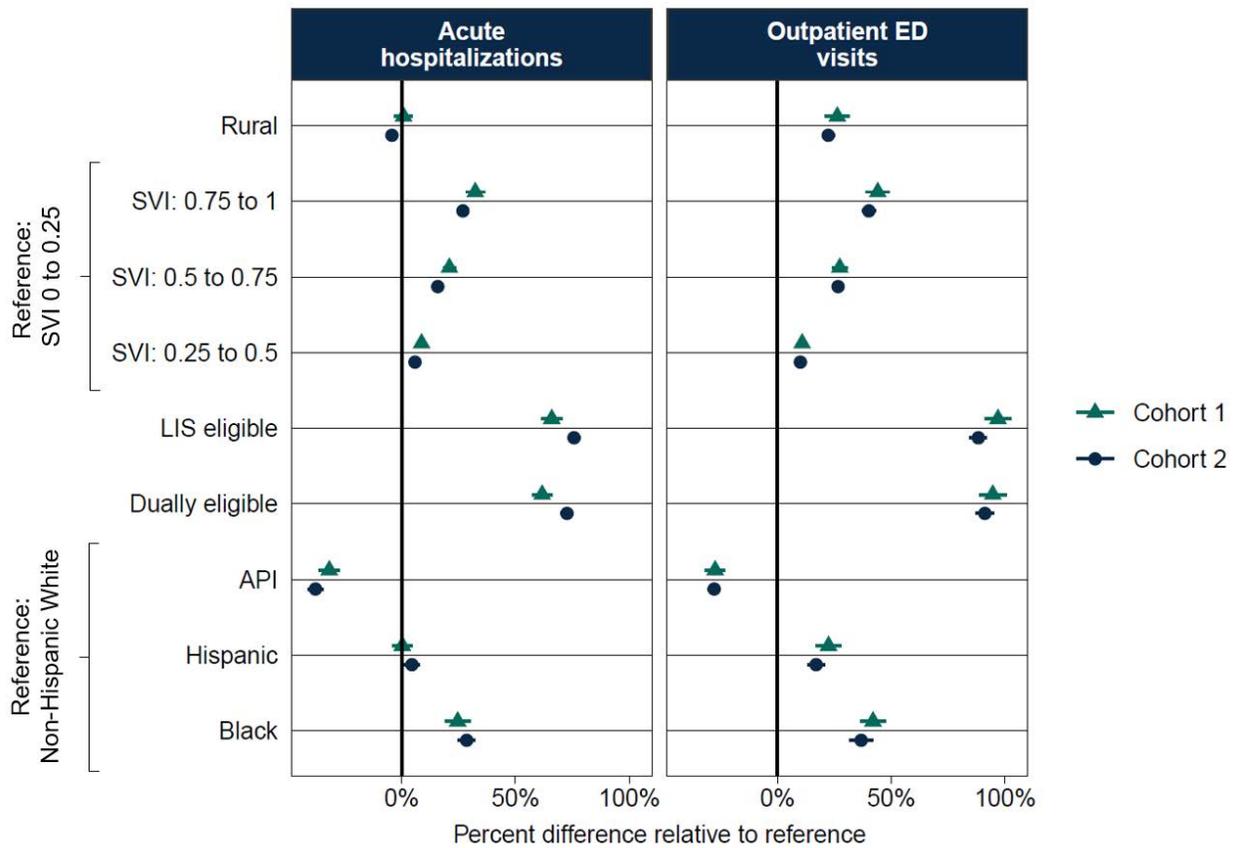
⁵⁰ Other groups (such as American Indian and Alaska Native or multiracial beneficiaries) might also be affected by health disparities in acute care. We focused on non-Hispanic Black, Hispanic, non-Hispanic API, and Non-Hispanic White beneficiaries because of concerns that race and ethnicity information for other groups would be too inaccurate for a sound assessment of disparities, even using sophisticated imputation techniques (Haas et al. 2019)

B.3.2. Disparities in overall acute care use

Beneficiaries who were non-Hispanic Black, dually eligible for Medicare and Medicaid, Part D LIS eligible, or living in a higher SVI census tract had higher rates of acute hospitalization than beneficiaries who were not (Exhibit B.3.1, left panel). For example, non-Hispanic Black beneficiaries in Cohort 1 had a 25 percent higher rate of acute hospitalization than non-Hispanic White beneficiaries, equivalent to 70 more acute hospitalizations per 1,000 beneficiaries annually. Medicare and Medicaid dually eligible and Part D LIS eligible beneficiaries had especially high rates of acute hospitalization compared with beneficiaries who were not (62 and 66 percent higher, respectively). These differences amounted to more than 150 additional acute hospitalizations per 1,000 beneficiaries per year for beneficiaries in the low-income groups. These especially large differences might be driven in part by increased levels of disability among Part D LIS eligible and Medicare and Medicaid dually eligible beneficiaries. Beneficiaries in these lower-income groups were much more likely than other beneficiaries to have disability in their original reason for Medicare entitlement (OREC), a strong predictor of high levels of acute hospitalizations and emergency department (ED) visits. For example, 65 percent of Medicare and Medicaid dually eligible PCF beneficiaries in this analysis had disability as their original reason for Medicare entitlement, compared with 10 percent of Medicare and Medicaid non-dually eligible beneficiaries. Likewise, among Medicare Part D beneficiaries in this analysis, 64 percent of Part D LIS eligible beneficiaries had disability as their OREC compared with 8 percent of Part D non-LIS eligible beneficiaries. OREC does not, however, entirely explain the higher rates of acute care use in Part D LIS eligible and Medicare and Medicaid dually eligible beneficiaries because higher rates of acute care use among Part D LIS eligible and Medicare and Medicaid dually eligible beneficiaries persist even after stratifying by OREC. For example, Part D LIS and Medicare and Medicaid dually eligible beneficiaries without disability as their OREC still had 61 and 63 percent higher acute hospitalization rates, respectively, than Part D non-LIS and Medicare and Medicaid non-dually eligible beneficiaries without disability as their OREC.

Disparities in outpatient ED visits tended to be similar to or larger (in terms of percentage differences) than disparities in acute hospitalizations (Exhibit B.3.1, right panel). For example, Medicare and Medicaid dually eligible and Part D LIS eligible beneficiaries had nearly double the rate of outpatient ED visits compared with beneficiaries who were not Medicare and Medicaid dually eligible or Part D LIS eligible (95 and 97 percent higher, respectively). Moreover, some beneficiary groups with no substantial differences in acute hospitalization rates had elevated rates of outpatient ED visits. Hispanic beneficiaries and beneficiaries living in a rural zip code had higher rates of outpatient ED visits than non-Hispanic White beneficiaries and beneficiaries living in a non-rural zip code (23 and 26 percent higher, respectively), whereas there was little difference in acute hospitalizations for these two groups. These relatively larger disparities in outpatient ED visits (compared with acute hospitalizations) suggest that there were additional disparities in emergent care needs or accessibility of care. In particular, differences in outpatient ED visits might capture additional disparities in access to care because beneficiaries might seek care at the ED for non-emergent or primary-care-substitutable conditions if they do not have access to a primary care provider.

Exhibit B.3.1. Baseline acute care utilization among beneficiaries assigned to PCF practices



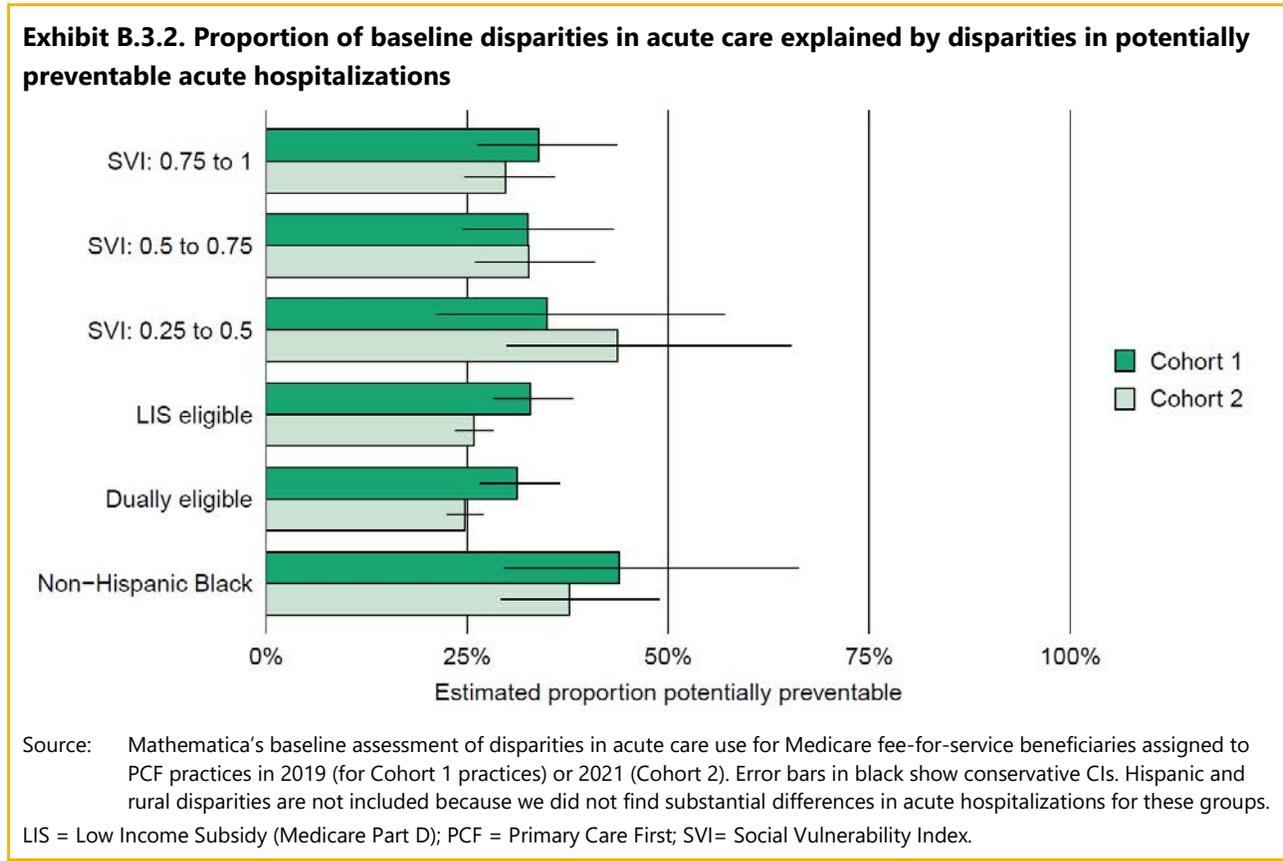
Source: Mathematica’s baseline assessment of disparities in acute care use for Medicare fee-for-service beneficiaries assigned to PCF practices in 2019 (for Cohort 1 practices) or 2021 (Cohort 2).

Notes: This exhibit is a copy of Exhibit 2.9 in Chapter 2. The comparisons shown are (from top to bottom): rural versus non-rural; higher SVI bin versus lowest SVI bin (0 to 0.25); LIS eligible Medicare Part D beneficiaries versus Medicare Part D beneficiaries without LIS; Medicare and Medicaid dually eligible versus non-dually eligible; and non-Hispanic API, non-Hispanic Black, or Hispanic versus non-Hispanic White. Estimates of racial and ethnic disparities in acute care use were adjusted for age and sex. All other estimates were adjusted for age, sex, and race and ethnicity. Error bars depict 90% confidence intervals.

API = Asian or Pacific Islander; ED= emergency department; LIS = Low Income Subsidy (Medicare Part D); PCF = Primary Care First; SVI= Social Vulnerability Index.

B.3.3. Disparities in potentially preventable or substitutable acute care

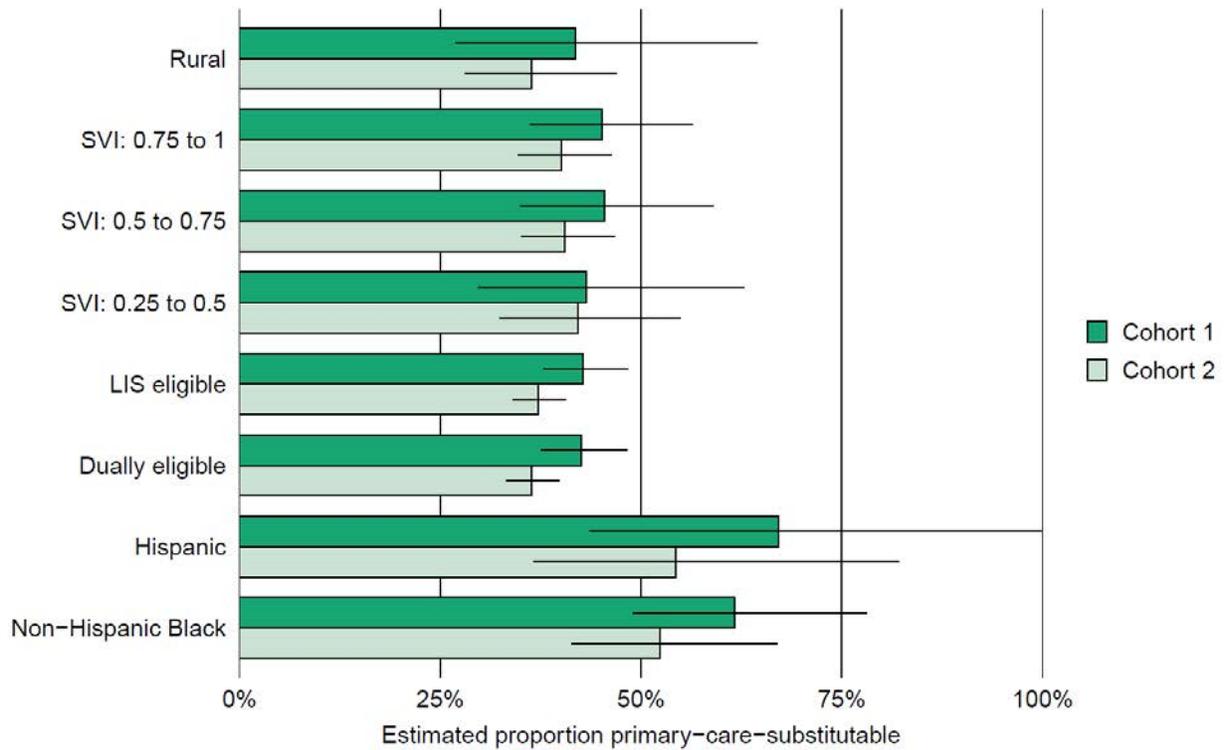
Disparities in potentially preventable⁵¹ or primary care substitutable utilization⁵² were similar to or larger than disparities in overall utilization, suggesting potential inequities in the quality and accessibility of primary care. Moreover, disparities in these types of utilization can account for a substantial proportion of disparities in overall utilization [Exhibit B.3.2 and B.3.3]. For example, after adjusting for age and sex, non-Hispanic Black beneficiaries in Cohort 1 had 117 more primary-care-substitutable outpatient ED visits and 189 more outpatient ED visits overall (per 1,000 beneficiaries per year) than non-Hispanic White beneficiaries. These estimates suggest that eliminating racial disparities in primary-care-substitutable outpatient ED visits could reduce overall outpatient ED visit disparities for non-Hispanic Black beneficiaries by up to 62 percent. Prior research suggests that primary care initiatives can have more impact on potentially preventable or primary-care-substitutable acute care use than other types of acute care use (Timmins et al. 2020). If PCF narrows gaps in potentially preventable and primary-care-substitutable acute care use, this could reduce overall disparities in acute care use across PCF beneficiary groups over the course of the model.



⁵¹ Potentially preventable hospitalizations were identified based on Prevention Quality Indicators (PQIs) and Inpatient Quality Indicators (IQIs) developed by the Agency for Healthcare Research and Quality. These included nine out of 10 PQIs (short and long-term complications from diabetes, chronic obstructive pulmonary disease, hypertension, heart failure, bacterial pneumonia, urinary tract infections, uncontrolled diabetes, lower extremity amputations among patients with diabetes), plus two additional conditions related to IQIs (acute myocardial infarction and stroke). Asthma in younger adults (the final PQI type) was omitted because it was less relevant to the Medicare population.

⁵² This outcome included outpatient ED visits identified as either non-emergent or primary-care-substitutable based on the New York University ED Admissions algorithm (see Johnston et al. 2017 for a description of the “patched” algorithm that we applied).

Exhibit B.3.3. Proportion of baseline disparities in acute care explained by disparities in non-emergent or primary-care-substitutable outpatient ED visits



Source: Mathematica’s baseline assessment of disparities in acute care use for Medicare fee-for-service beneficiaries assigned to PCF practices in 2019 (for Cohort 1 practices) or 2021 (Cohort 2). Error bars in black show conservative confidence intervals. Hispanic and rural disparities are not included in panel A because we did not find substantial differences in acute hospitalizations for these groups.

ED= emergency department; LIS = Low Income Subsidy (Medicare Part D); PCF = Primary Care First; SVI= Social Vulnerability Index.

Appendix B.4. Payment findings

B.4.1. Services included in PCF Model payment components

The professional Population-based payment (PBP) is meant to partially replace FFS revenue from specific primary care services for a practice's attributed beneficiary population. Practices whose patients have, on average, more complex conditions receive a higher PBP to compensate for the more resource-intensive care these patients require. Exhibit B.4.1 lists the services and related HCPCS codes included in the calculations of the professional PBP, flat visit fee, and payment accuracy adjustment (PAA).

Exhibit B.4.1. Services included in the PCF professional population-based payment, flat visit fee, and payment accuracy adjustment for attributed Medicare beneficiaries

	Professional population-based payment	Flat visit fee	Payment accuracy adjustment
Office/outpatient visit E&M	99202–99205, 99211, 99215, G2211	99202–99205, 99211–99215	99202–99205, 99211–99215
Prolonged E&M	99354, 99355, 99415, 99416, G2212	99354, 99355, 99415, 99416	Not included
Transitional care management services	99495, 99496	99495, 99496	99495, 99496
Home care/domiciliary care E&M	99324–99328, 99334–99337, 99341–99345, 99347–99350	99324–99328, 99334–99337, 99341–99345, 99347–99350	99324–99328, 99334–99337, 99341–99345, 99347–99350
In-Home care/domiciliary care plan oversight	99339, 99340	Not included	99339, 99340
Advance care planning	99497, 99498	99497, 99498	99497
Welcome to Medicare and Annual Wellness Visits	G0402, G0438, G0439	G0402, G0438, G0439	G0402, G0438, G0439
Chronic care management services ^a	99487, 99489–99491	Not included	99487, 99490, 99491

Source: Mathematica's summary of Primary Care First: Payment and Attribution Methodologies PY 2022, Version August 2021, Center for Medicare & Medicaid Innovation.

^a Services can contribute to the payment accuracy adjustment (PAA) if they are billed by a primary care practitioner except for chronic care management services, which counts toward the PAA if billed by any Medicare practitioner.

E&M = evaluation and management; HCPCS = Healthcare Common Procedures Coding System; PCF = Primary Care First.

B.4.2. Population-based payments in 2022

Practices in both cohorts received an average of \$235,523 in PBPs in 2022 (Exhibit B.4.2). On average, PBPs were 10 percent higher for Cohort 2 practices than for Cohort 1 practices in 2022 because of higher average number of attributed beneficiaries and the fact that the PAA had not been applied to Cohort 2 practice payments in 2022. Higher risk group practices tended to receive higher PBPs than lower risk group practices because the base capitation rate increases for each risk group. For example, the average PBP for risk group 4 was \$814,684 compared with \$224,860 for risk group 1.

For Cohort 1 practices, PBPs decreased on both a total and per-provider basis in quarters 3 and 4 of 2022 compared with quarters 1 and 2 (Exhibit B.4.3 and B.4.4). This decrease is attributable to the downward effect of the PAA even as most practices received a positive PBA.

Exhibit B.4.2. Annual population-based payments in 2022 by risk group and cohort

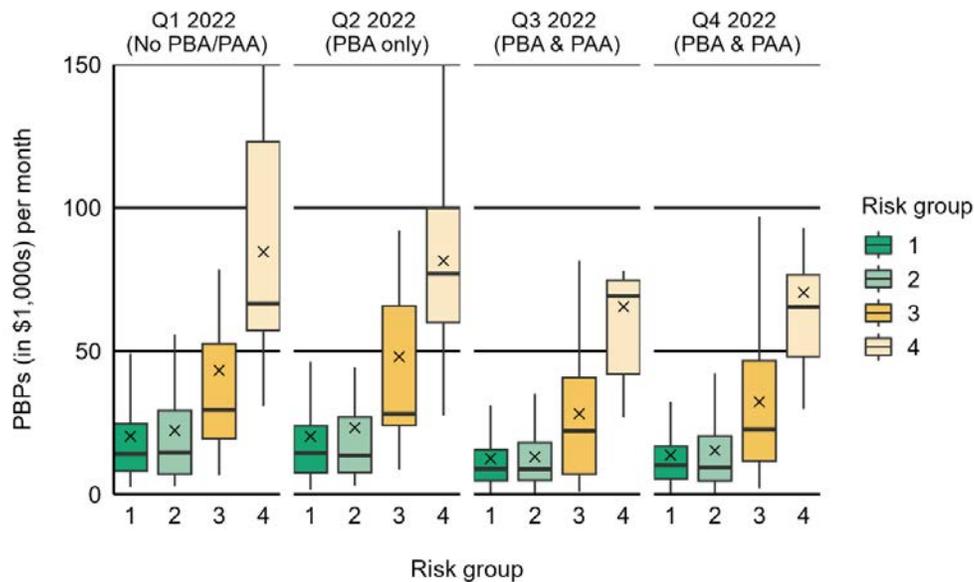
Cohort	Risk group 1			Risk group 2			Risk group 3			Risk group 4			All risk groups		
	1	2	All	1	2	All									
Number of practices	570	1,954	2,524	80	173	253	19	27	46	9	11	20	678	2,165	2,843
Average number of attributed beneficiaries per practice	704	712	710	487	499	495	423	450	439	522	371	439	668	690	685
Median number of attributed beneficiaries per practice	507	522	517	304	347	344	261	349	293	389	196	301	489	499	497
Average total PBP per practice	\$200,150	\$232,069	\$224,860	\$221,597	\$260,063	\$247,900	\$455,091	\$532,768	\$500,684	\$905,911	\$740,044	\$814,684	\$219,193	\$240,637	\$235,523
Median total practice PBP	\$143,690	\$169,150	\$163,464	\$131,424	\$182,129	\$173,699	\$288,508	\$376,511	\$332,666	\$804,928	\$409,385	\$617,995	\$149,624	\$171,544	\$166,378
Largest total practice PBP	\$2,042,039	\$2,115,935	\$2,115,935	\$1,670,372	\$1,764,417	\$1,764,417	\$1,383,739	\$1,736,732	\$1,736,732	\$1,828,772	\$4,189,958	\$4,189,958	\$2,042,039	\$4,189,958	\$4,189,958
Smallest total practice PBP	\$13,476	\$4,807	\$4,807	\$22,732	\$5,195	\$5,195	\$62,350	\$12,675	\$12,675	\$344,015	\$56,269	\$56,269	\$13,476	\$4,807	\$4,807

Source: Mathematica’s analysis of 2022 Primary Care First payments.

Notes: For Cohort 1 practices, the PBA went into effect in quarter 2 of 2022, and the PAA went into effect in quarter 3 of 2022.

PAA = payment accuracy adjustment; PBP = population-based payment.

Exhibit B.4.3. 2022 population-based payments for Cohort 1 practices, by risk group

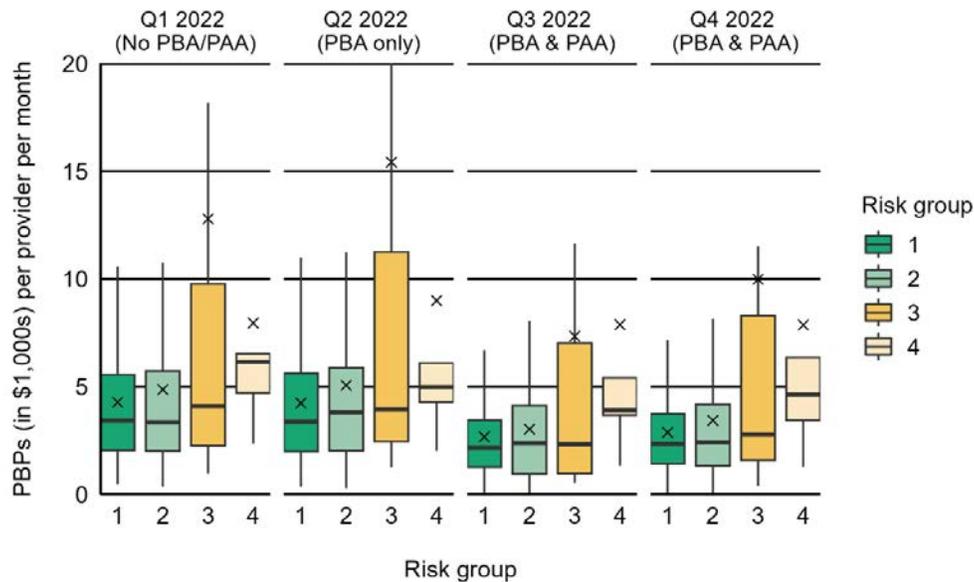


Source: Mathematica’s analysis of 2022 Primary Care First payments to Cohort 1 practices.

Notes: The boxes show the 25th percentile, median, and 75th percentile. We restricted this analysis to practices that were active as of the end of 2022 (N = 678). The PBA went into effect in quarter 2 of 2022. The PAA went into effect in quarter 3 of 2022. Risk group counts: 570 in group 1; 80 in group 2; 19 in group 3; and 9 in group 4.

PAA = payment accuracy adjustment; PBA = performance-based adjustment; PBP = population-based payment.

Exhibit B.4.4. 2022 per-provider population-based payments for Cohort 1 practices, by risk group



Source: Mathematica’s analysis of 2022 Primary Care First payments to Cohort 1 practices.

Notes: The boxes show the 25th percentile, median, and 75th percentile, and the “X” shows the average. They are weighted by number of providers at each practice. We restricted this analysis to practices that were active as of the end of 2022 (N = 678). The PBA went into effect in quarter 2 of 2022. The PAA went into effect in quarter 3 of 2022. Risk group counts: 570 in group 1; 80 in group 2; 19 in group 3; and 9 in group 4.

PAA = payment accuracy adjustment; PBA = performance-based adjustment; PBP = population-based payment.

B.4.3. Performance-based adjustments in 2022

Among all Cohort 1 practices, about 62 percent earned a positive performance-based adjustment (PBA) in 2022 compared with 10 percent who earned a neutral PBA and 27 percent that received a negative adjustment (Exhibit B.4.5). On average, Cohort 1 practices received a PBA of \$14,177 in 2022. Of any subgroup, rural practices were most likely to receive a positive PBA (83 percent) compared with 71 percent of suburban practices and 60 percent of urban practices. On average, rural practices saw their payments increase by about 14 percent, compared with about 7 percent for all Cohort 1 practices (Exhibit B.4.6). Although the proportion of practices receiving positive, negative, and neutral PBAs stayed relatively stable from Q2 to Q4 of 2022, there was churn at the practice level across these outcomes (B.4.7 and B.4.8). Cohort 2 practices were not eligible for the PBA in 2022.

Exhibit B.4.5. Performance-based adjustment results for Cohort 1 practices by risk group, ownership type, practice size and urbanicity in 2022

Subgroup	Number of practices	Practices with positive PBA	Practices with neutral PBA	Practices with negative PBA	Average PBA	Median PBA	Maximum PBA	Minimum PBA
Overall	678	423 (62%)	69 (10%)	186 (27%)	\$14,477	\$4,422	\$427,293	-\$128,494
Risk group 1	570	349 (61%)	63 (11%)	158 (28%)	\$13,046	\$4,048	\$427,293	-\$121,138
Risk group 2	80	57 (71%)	2 (2%)	21 (26%)	\$15,772	\$7,227	\$250,397	-\$40,332
Risk group 3	19	13 (68%)	2 (11%)	4 (21%)	\$49,971	\$34,973	\$183,328	-\$12,504
Risk group 4	9	4 (44%)	2 (22%)	3 (33%)	\$18,667	\$0	\$234,422	-\$128,494
Affiliated with a health system	492	300 (61%)	53 (11%)	139 (28%)	\$12,823	\$4,554	\$234,422	-\$121,138
Independent	115	77 (67%)	7 (6%)	31 (27%)	\$19,841	\$4,577	\$395,620	-\$128,494
Owned by some other health care delivery organization	70	46 (65%)	9 (13%)	15 (21%)	\$17,498	\$4,007	\$427,293	-\$32,119
Small	134	84 (63%)	10 (7%)	40 (30%)	\$10,314	\$1,688	\$207,929	-\$40,332
Medium	443	276 (62%)	45 (10%)	122 (28%)	\$12,432	\$4,548	\$395,620	-\$48,284
Large	101	63 (62%)	14 (14%)	24 (24%)	\$28,971	\$10,143	\$427,293	-\$128,494
Rural	24	20 (83%)	1 (4%)	3 (13%)	\$24,336	\$18,055	\$120,244	-\$6,884
Suburban	64	46 (72%)	6 (9%)	12 (19%)	\$18,897	\$8,147	\$150,635	-\$10,031
Urban	589	357 (61%)	62 (11%)	170 (29%)	\$13,620	\$3,968.58	\$427,293	-\$128,494

Source: Mathematica's analysis of 2022 Primary Care First payments for Cohort 1 practices.

Notes: For Cohort 1 practices, the PBA went into effect in quarter 2 of 2022.

PAA = payment accuracy adjustment; PBA = performance-based adjustment; PBP = population-based payment.

Exhibit B.4.6. PBA percentage for Cohort 1 practices by risk group, ownership type, practice size and urbanicity in 2022

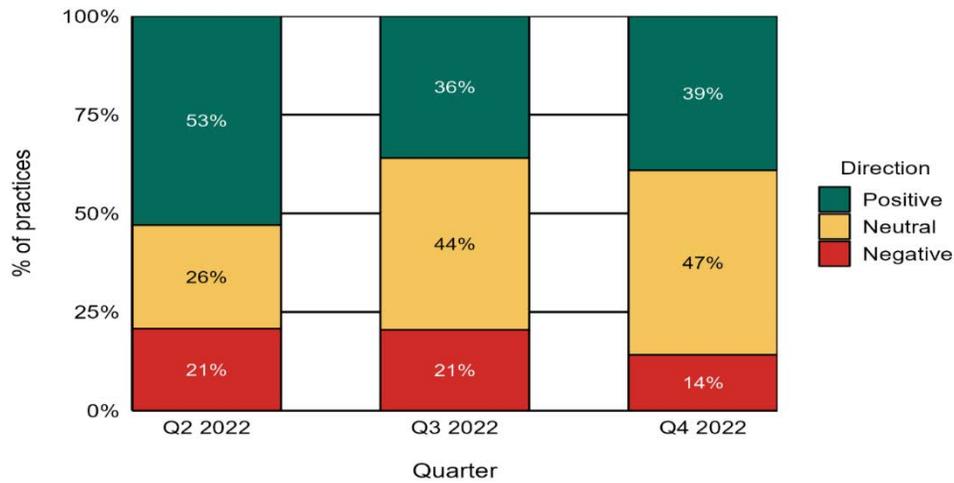
Subgroup	Number of practices	Average PBA %	Maximum PBA %	Minimum PBA %
Overall	678	7.2%	50%	-10%
Risk group 1	570	6.8%	50%	-10%
Risk group 2	80	9.3%	46%	-10%
Risk group 3	19	9.8%	30%	-10%
Risk group 4	9	6.2%	40%	-10%
Affiliated with a health system	492	6.9%	50%	-10%
Independent	115	8.1%	50%	-10%
Owned by some other health care delivery organization	70	7.4%	43%	-10%
Small	134	8.0%	50%	-10%
Medium	443	6.7%	50%	-10%
Large	101	8.1%	50%	-10%
Rural	24	14.5%	40%	-5.2%
Suburban	64	10.0%	47.2%	-10%
Urban	589	6.6%	50%	-10%

Source: Mathematica's analysis of 2022 Primary Care First payments for Cohort 1 practices.

Notes: For Cohort 1 practices, the PBA went into effect in quarter 2 of 2022.

PAA = payment accuracy adjustment; PBA = performance-based adjustment; PBP = population-based payment.

Exhibit B.4.7. PBA results by quarter for Cohort 1 practices in 2022

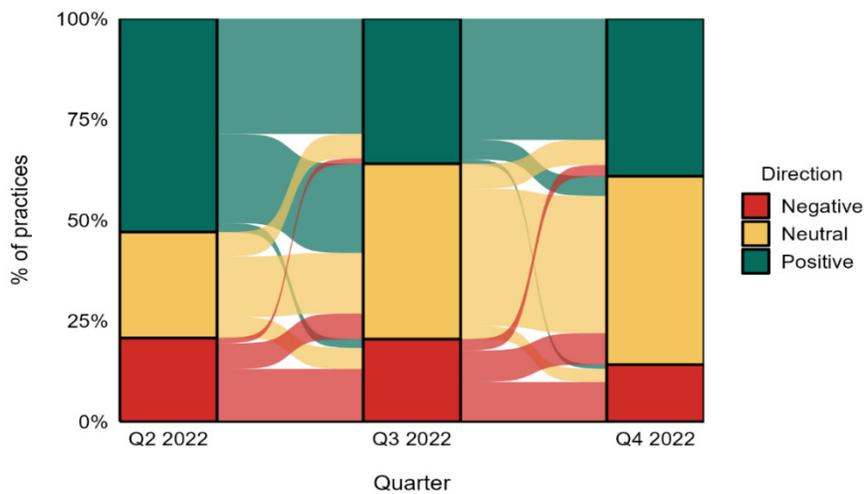


Source: Mathematica’s analysis of 2022 Primary Care First payments to Cohort 1 practices.

Notes: We restricted this analysis to practices that were active as of the end of 2022 (N = 678). The PBA went into effect in quarter 2 of 2022. This diagram shows how the proportion of positive, negative, and neutral PBAs changed from one quarter to the next. The three stacked bars (one for each quarter) show the proportion of practices earning a positive, negative, and neutral PBA in each quarter. Risk group counts: 570 in group 1; 80 in group 2; 19 in group 3; and 9 in group 4.

PBA = performance-based adjustment.

Exhibit B.4.8. PBA churn for Cohort 1 practice in 2022 (Sankey Diagram)



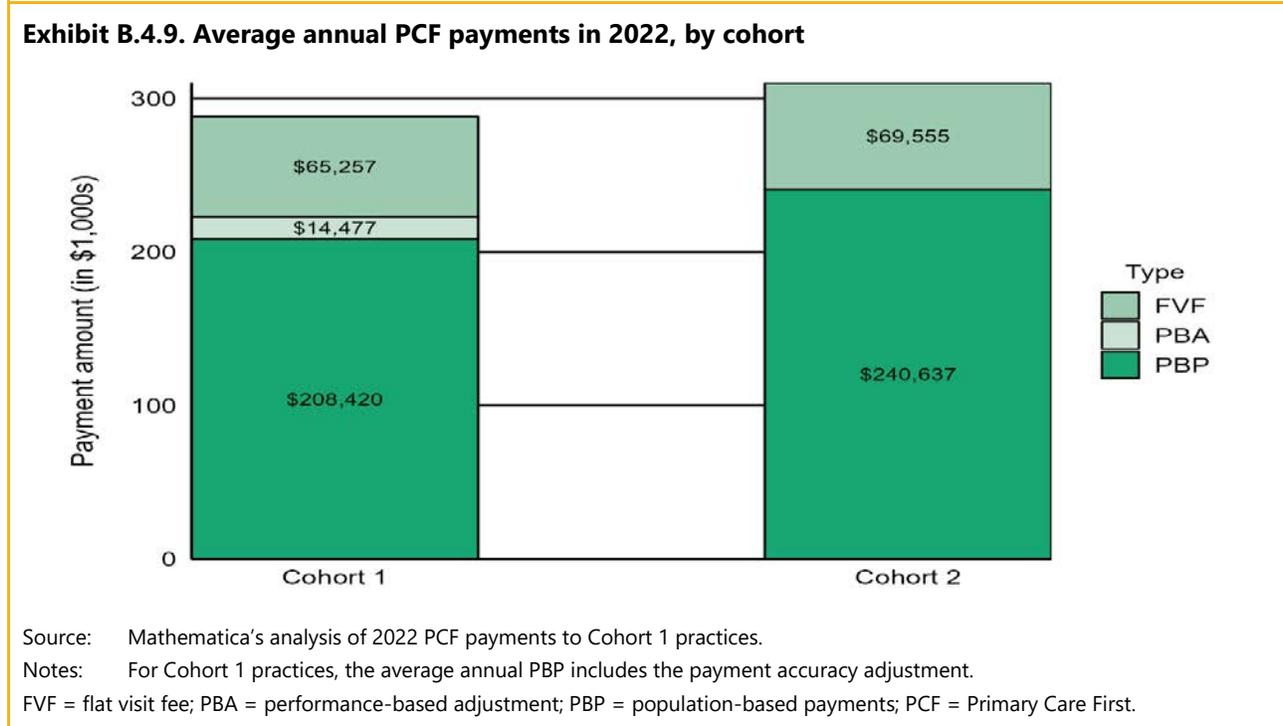
Source: Mathematica’s analysis of 2022 Primary Care First payments to Cohort 1 practices.

Notes: We restricted this analysis to practices that were active as of the end of 2022 (N = 678). The PBA went into effect in quarter 2 of 2022. This diagram shows how the proportion of positive, negative, and neutral PBAs changed from one quarter to the next. The three stacked bars (one for each quarter) show the proportion of practices earning a positive, negative, and neutral PBA in each quarter. In addition to the bars, however, are flows that show how each category feeds into the subsequent quarter. For example, for those practices with a negative PBA in quarter 2 (the red piece of the leftmost bar), the flow depicts the proportion of those practices that (1) remained negative, (2) changed to neutral, and (3) changed to positive in quarter 3.

PBA = performance-based adjustment.

B.4.4. Average PCF payments by cohort in 2022

On average, total PCF payments were about 8 percent higher for Cohort 2 practices than for Cohort 1 in 2022 because of a higher average number of attributed beneficiaries and because the PAA had not been applied to Cohort 2 practice payments in 2022 (Exhibit B.4.9). For Cohort 1 practices, PBPs represented 72 percent of total payments and the FVF and PBA accounted for 23 percent and 5 percent, respectively.



Appendix B.5. Quality Gateway measure performance

To be eligible for a positive we, Primary Care First (PCF) practices must meet or exceed minimum thresholds for Quality Gateway measures. CMS assesses practices in risk groups 1 and 2 with slightly different Quality Gateway measures than practices in risk groups 3 and 4. Exhibit B.5.1 illustrates the Quality Gateway measures, by risk group, as well as the minimum threshold practices must meet or exceed in performance year 2021 to be eligible for a positive PBA.

Exhibit B.5.1. Quality Gateway measures and benchmarks for performance year 2021

Quality Gateway measure	CBE ID	Risk group	Benchmark population	Benchmark for performance year 2021
Diabetes Hemoglobin A1c Poor Control	0059	Risk groups 1 and 2	MIPS	30th percentile: 99.45% ^b
Controlling High Blood Pressure	0018	Risk groups 1 and 2	MIPS	30th percentile: 30.00%
Colorectal Cancer Screening	0034	Risk groups 1 and 2	MIPS	30th percentile: 2.59%
Advance Care Plan	0326	All risk groups	MIPS	Pay-for-reporting
Patient Experience of Care Survey (PECS) ^a	0005	All risk groups	PCF population	30th percentile: 77.52%
Days at Home	N/A	Risk groups 3 and 4	CPC+ and non-CPC+ benchmark population	N/A ^c

^a The Patient Experience of Care Survey measure used in Primary Care First is a combination of items from the Clinician and Group CAHPS (CBE ID 0005) and the Patient-Centered Medical Home CAHPS Supplement.

^b For the Diabetes Hemoglobin A1c Poor Control measure, lower performance scores reflect better quality.

^c Practices in risk groups 3 and 4 will be assessed on their performance on the Days at Home measure beginning in 2023, based on their performance in 2022.

CAHPS = Consumer Assessment of Healthcare Providers and Systems; CBE = Consensus Based Entity.

Practices' performance on the Quality Gateway measures in performance year 2021 is based on data from the first performance year, and the results are applied to payments in the following year. To pass the Quality Gateway, practices must meet the minimum performance threshold (that is, the benchmark)—the 30th percentile—for the Quality Gateway measures. For performance year 2021, the benchmark population for the diabetes control, high blood pressure control, and colorectal cancer screening measures was the MIPS benchmark population. For the Advance Care Plan measure, in performance year 2021, practices were only assessed on their ability to report the measure in 2021. The benchmark population for the Patient Experience of Care Survey (PECS) Quality Gateway measure in performance year 2021 was the PCF population.

Based on a review of Quality Gateway measure data from performance year 2021, most practices met benchmarks for the applicable Quality Gateway measures, though a lower percentage of practices met benchmarks on the PECS measure than on the other four Quality Gateway measures. The lower percentage of practices meeting the PECS measure is expected because the population from which the 30th percentile benchmark is calculated is the PCF population, meaning that 30 percent of practices in PCF will not meet or exceed that benchmark. (Exhibit B.5.2).

Exhibit B.5.2. Percentage (and number) of PCF Cohort 1 practices that achieved benchmark for Quality Gateway measures in 2021

	CMS122: Diabetes Control	CMS165: High Blood Pressure Control	CMS130: Colorectal Cancer Screening	Quality ID 47: ACP Measure	Quality ID 0005: Patient Experience of Care Survey
Risk group 1	98% (582)	99% (584)	96% (570)	98% (593)	70% (423)
Risk group 2	93% (42)	93% (42)	89% (40)	96% (44)	65% (30)
Risk group 3	n.a.	n.a.	n.a.	100% (18)	61% (11)
Risk group 4	n.a.	n.a.	n.a.	100% (7)	57% (4)

Source: Mathematica’s analysis of Quality Gateway measure performance for eCQM, CQM, and PECS measures.

Notes: For the diabetes control, high blood pressure control, colorectal cancer screening, and the ACP measures, this exhibit shows the number and proportion of PCF practices within a risk group that achieved benchmark among all those practices that reported quality measure data. We excluded practices that did not report quality measure performance from the denominator for those measures. Diabetes control, high blood pressure control, and colorectal cancer screening measures were not Quality Gateway measures for practices in risk groups 3 and 4 and are thus not applicable.

ACP = Advance Care Plan; CMS = Centers for Medicare & Medicaid Services; CQM = clinical quality measure; eCQM = electronic clinical quality measure; n.a. = not applicable; PCF = Primary Care First; PECS = Patient Experience of Care Survey.

Appendix B.6. Items asked in the PCF Practice Portal

Exhibit B.6.1. Timing of the PCF Practice Portal reporting

Portal reporting	Cohort 1	Cohort 2
Baseline	March/April 2021	October/Nov 2021
Performance Year 1	Dec 2021/Jan 2022	October 2022
Performance Year 2	October 2022 ^a	October 2023
Performance Year 3	October 2023	October 2024
Performance Year 4	October 2024	October 2025
Performance Year 5	October 2025	October 2026

^a Chapter 6 data (General Model items) will not be usable for Performance Year 2 for Cohort 1 because, although both cohorts got the same wording, the wording was not correct for Cohort 1. This issue does not affect the Performance Year 2 Care Delivery items. We will collect Chapter 6's Performance Year 2 questions for Cohort 1 in October 2023.

Chapter 1. Access and continuity

1.1. 24/7 access

	Baseline	PY1	PY2
Does your practice provide 24/7 access to care informed, when necessary, by real-time access to the patient's EHR?	X	X	X
<input type="radio"/> No, we do not have 24/7 access to care guided by the EHR when needed. <input type="radio"/> Yes, we have 24/7 access to a care team practitioner, guided by the EHR.			

1.2. Enhanced access and communication

						Baseline	PY1	PY2
When patients need it, my practice is able to provide...							X	X
Services	Never	Rarely	Sometimes	Often	Always			
... same or next-day appointments.	<input type="radio"/>							
... office visits on the weekend, evening, or early morning.	<input type="radio"/>							
... email or portal advice on clinical issues.	<input type="radio"/>							

Appendix B.6. Items asked in the PCF Practice Portal

	Baseline	PY1	PY2
<p>How does your practice manage timely callbacks to high-risk patients with complex needs and/or seriously ill patients?</p> <ul style="list-style-type: none"> <input type="radio"/> We have not established protocols or pathways to ensure timely callbacks. <input type="radio"/> We are in the process of developing protocols or pathways to ensure timely callbacks to high-risk patients with complex needs and/or seriously ill patients. <input type="radio"/> We have basic protocols or pathways in place to ensure timely callbacks but not specifically for high-risk patients with complex needs and/or seriously ill patients. <input type="radio"/> We have specific protocols or pathways in place to ensure timely callbacks to patients with complex needs and/or seriously ill patients. 		X	X
<p>How does your practice use the payment flexibility in this model to provide enhanced access? (Select all that apply)</p> <ul style="list-style-type: none"> <input type="radio"/> We do not provide any enhanced access approaches <input type="radio"/> Visits to hospitals, nursing facilities, or other locations by any staff as part of care management and coordination <input type="radio"/> Practitioner visits in alternate locations, including home-based visits <input type="radio"/> Visits in the home by designated staff for care management activities, home assessments, education, or self-management support <input type="radio"/> Practice group visits for purposes of disease management, self-management, and other support <input type="radio"/> Video-based conferencing for primary care visits (e.g., telehealth or telemedicine) <input type="radio"/> Visit over an electronic exchange (phone or, e-visit, portal, email) <input type="radio"/> Patient outreach by community health worker, health coach, and/or caregiver support staff <input type="radio"/> Activities that support the family/caregiver <input type="radio"/> Other: (textbox) 		X	X

		Baseline	PY1	PY2
<p>Which model beneficiary engagement incentives is your practice providing to your Medicare beneficiaries? (Select all that apply)</p> <ul style="list-style-type: none"> <input type="radio"/> None <input type="radio"/> Reduced or waived applicable co-insurance for PCF flat visit fees 	<p>To which of the following categories of beneficiaries and/or types of clinical needs is your practice providing these beneficiary engagement incentives? (Select all that apply)</p> <ul style="list-style-type: none"> <input type="radio"/> Medicare beneficiaries with financial needs <input type="radio"/> Medicare beneficiaries with complex health needs <input type="radio"/> Medicare beneficiaries with recent hospitalization(s) or Emergency Department (ED) visits <input type="radio"/> All of the above <input type="radio"/> Other, please specify: (textbox) 		X	X

Appendix B.6. Items asked in the PCF Practice Portal

		Baseline	PY1	PY2
<input type="radio"/> Transportation (e.g., practice-operated van or vouchers for ride sharing services for face-to-face care)	<input type="radio"/> With financial need <input type="radio"/> With complex health needs <input type="radio"/> With recent hospitalization(s) and/or ED visits <input type="radio"/> All of the above <input type="radio"/> Other, please specify: (textbox)			
<input type="radio"/> Nutrition (e.g., food vouchers, Meals on Wheels services, Weight Watchers classes)	<input type="radio"/> With financial need <input type="radio"/> With complex health needs <input type="radio"/> With recent hospitalization(s) and/or ED visits <input type="radio"/> All of the above <input type="radio"/> Other, please specify: (textbox)			
<input type="radio"/> Medical equipment (e.g., blood pressure equipment; remote monitoring devices)	<input type="radio"/> With financial need <input type="radio"/> With complex health needs <input type="radio"/> With recent hospitalization(s) and/or ED visits <input type="radio"/> All of the above <input type="radio"/> Other, please specify: (textbox)			
Coverage of diabetic shoes under current Medicare regulations requires a physician to certify that a patient has diabetes and has a therapeutic need for diabetic shoes. PCF is allowing a waiver that would allow <u>nurse practitioners</u> to certify the need for diabetic shoes. Is your practice currently using this waiver to allow nurse practitioners to certify the need for diabetic shoes? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not sure			X (but was in section 6.6)	X

1.3. Empanelment

	Baseline	PY1	PY2
What percentage of patients are empaneled to a practitioner or care team? <input type="radio"/> None (0%) <input type="radio"/> Some (<50% of all patients) <input type="radio"/> Most (50-95%) <input type="radio"/> All (95-100%)	X	X	X
<input type="radio"/> Please provide the current number of active patients the practice is currently seeing. _____ (Numeric Field)		X	X

1.4. Continuity of care

	Baseline	PY1	PY2
Of a patient's face-to-face visits, what percentage is provided by their empaneled practitioner or care team on average?		X	X
<input type="radio"/> None (0%) <input type="radio"/> Some (<50% of all patients) <input type="radio"/> Most (50-95%) <input type="radio"/> All (95-100%)			

Chapter 2. Care management

2.1. Risk stratification

	Baseline	PY1	PY2
Do you risk stratify your empaneled patients?	X	X	X
<input type="radio"/> Yes <input type="radio"/> No			

	Baseline	PY1	PY2
Is risk stratification integrated within your EHR or health information technology (IT) system?		X	X
<input type="radio"/> Yes <input type="radio"/> No			
Which of the following best describes your practice's risk stratification methodology?		X	X
a) We use an EHR/IT-based, structured, data-driven algorithm b) We use clinical intuition and judgment c) Both a and b			

2.2. Identifying patients for care management

	Baseline	PY1	PY2
Which of the following best describes your practice's care management approach?	X	X	X
a) Proactive, relationship-based (longitudinal) care management for patients identified as high need and/or high risk b) Short-term, goal-oriented episodic care management for patients who have acute or urgent needs (e.g. transitions of care, new serious diagnosis or injury, medical crisis, major life event, or other triggering event) c) Both a and b d) None of the above			

2.3. Personalized care planning

	Baseline	PY1	PY2
How do you use documented, personalized care plans?	X	X	X
<input type="radio"/> For patients receiving care management only <input type="radio"/> For patients identified as at high risk or increased complexity regardless of whether they receive care management services <input type="radio"/> For SIP patients only (if a SIP practice) <input type="radio"/> Varies based on practitioner preference <input type="radio"/> Other: (textbox) <input type="radio"/> We don't use documented, personalized care plans			

						Baseline	PY1	PY2
Which of the following elements are included in your care planning process and personalized care plan that you develop with patients?							X	X
Elements	Never	Rarely	Sometimes	Often	Always			
Mutually agreed upon and developed with patient and family.								
Accessible to all team members providing care for the patient.								
Accessible to the patient in clear, simple language to make it easier for the patient/caregiver to understand and use.								
Written care plan in clear, simple language for patient/caregiver to understand and use.								
Our personalized care plan contains the following information (Select all that apply)							X	X
<input type="radio"/> Patient's overall health or functional goals <input type="radio"/> Treatment goals specific to the patient's condition(s) <input type="radio"/> Advance directives and preferences for care <input type="radio"/> Key contact information for the practice and, if applicable, referral specialists <input type="radio"/> Key actions the patient will take and important contingencies (if/then) specific for the patient and their conditions <input type="radio"/> Other: (textbox)								

2.4. Staffing support for your high-need patients

	Baseline	PY1	PY2
What type of clinicians and staff at your practice support your high-need and/or high-risk patients? (Select all that apply) <ul style="list-style-type: none"> <input type="radio"/> Practitioner specializing in high-need patients <input type="radio"/> Care manager <input type="radio"/> Social worker <input type="radio"/> Behavioral health specialist <input type="radio"/> Pharmacist <input type="radio"/> Community health aid or outreach <input type="radio"/> Health coach or educator <input type="radio"/> Other: (textbox) <input type="radio"/> None of the above 	X	X	X

2.5. Hospital and ED patient follow-up

	Baseline	PY1	PY2
Our practice routinely and proactively follows up with patients discharged from hospital: <ul style="list-style-type: none"> <input type="radio"/> Yes—All patients <input type="radio"/> Yes—Selectively, based on patient diagnosis, patient characteristics, and/or patient risk <input type="radio"/> No—We do not routinely and proactively follow up on patients discharged from hospital 	X	X	X
Our practice follows up with patients discharged within <ul style="list-style-type: none"> <input type="radio"/> 24 hours <input type="radio"/> 48 hours <input type="radio"/> 72 hours <input type="radio"/> 1 week <input type="radio"/> 2 weeks <input type="radio"/> We do not have these data, or unknown timeframe 	X	X	X
Our practice routinely and proactively follows up with patients discharged from ED: <ul style="list-style-type: none"> <input type="radio"/> Yes—All patients <input type="radio"/> Yes—Selectively, based on patient diagnosis, patient characteristics, and/or patient risk <input type="radio"/> No—We do not routinely and proactively follow up on patients discharged from ED 	X	X	X

	Baseline	PY1	PY2
Our practice follows up with patients discharged within	X	X	X
<input type="radio"/> 24 hours			
<input type="radio"/> 48 hours			
<input type="radio"/> 72 hours			
<input type="radio"/> 1 week			
<input type="radio"/> 2 weeks			
<input type="radio"/> We do not have these data, or unknown timeframe			

Chapter 3. Comprehensiveness and coordination

3.1. Behavioral health integration

	Baseline	PY1	PY2
Our strategy for integrating behavioral health services into our practice is best described by the following:		X	X
<input type="radio"/> Behavioral Care Management or Collaborative Care Management			
<input type="radio"/> Primary Care Behaviorist model or co-located behavioral health professional			
<input type="radio"/> Blend of the two			
<input type="radio"/> None, we do not integrate behavioral health into our practice			
Our practice also uses these approaches for Behavioral Health Care: (Select all that apply)		X	X
<input type="radio"/> High-quality referral and coordination with behavioral health specialty care			
<input type="radio"/> Assess and track patient-reported outcomes for behavioral health conditions under active management (e.g., depression or anxiety)			
<input type="radio"/> No enhanced strategies beyond traditional referral			
<input type="radio"/> Other: (textbox)			

3.2. Addressing health-related social needs

	Baseline	PY1	PY2
Do you routinely screen your patients for health-related social needs?		X	X
<input type="radio"/> We screen a targeted subpopulation of patients for health-related social needs.			
<input type="radio"/> We universally screen all patients for health-related social needs.			
<input type="radio"/> We do not screen patients for health-related social needs.			
Do you maintain an inventory of social services and supports to meet patients' health-related social needs that is integrated with your EHR or health IT system?		X	X
<input type="radio"/> No, we do not maintain an inventory of social service resources.			
<input type="radio"/> Yes, we have an inventory of social service resources, but it is not integrated with our EHR or health IT system.			
<input type="radio"/> Yes, we have an inventory of social service resources integrated with our EHR or health IT system.			

	Baseline	PY1	PY2
<p>Do you have an established, ongoing relationship with social or community resources to address the following health-related social needs? (Select all that apply)</p> <ul style="list-style-type: none"> <input type="radio"/> Food insecurity <input type="radio"/> Housing instability <input type="radio"/> Utility needs <input type="radio"/> Finance resources strain <input type="radio"/> Transportation <input type="radio"/> Employment <input type="radio"/> Social isolation <input type="radio"/> Safety <input type="radio"/> Activities of daily living or chores services <input type="radio"/> Other: (textbox) <input type="radio"/> We do not have established, ongoing relationship with social or community resources. 		X	X

3.3. Coordinated referral management

	Baseline	PY1	PY2
<p>Which best describes your practice’s approach to ensure a coordinated referral management system for your high-need patient population (patients who are high-risk, complex, or seriously ill)? (Select all that apply)</p> <ul style="list-style-type: none"> <input type="radio"/> Our practice has established policies and procedures in place to ensure high-value referrals for specialty care and other care organizations. <input type="radio"/> Our practice uses data to determine high-volume and/or high-cost specialty providers. <input type="radio"/> Our practice employs collaborative care agreements to facilitate effective coordination between practice and referral site. <input type="radio"/> Our practice employs eConsultations to facilitate effective coordination between practice and referral site. <input type="radio"/> Our practice employs other tools to facilitate effective coordination between practice and referral site: (textbox) 		X	X

Chapter 4. Patient and caregiver engagement

4.1. Advance care planning

	Baseline	PY1	PY2
How does your practice identify patients for advance care planning? (Select all that apply)	X	X	X
<input type="radio"/> We do not systematically identify patients for advance care planning			
<input type="radio"/> High-risk status (using the practice's risk stratification methodology)			
<input type="radio"/> Patients with serious illness and/or based on age (e.g., cancer diagnosis, end-stage kidney disease, heart failure, COPD)			
<input type="radio"/> Clinician or care team referral/identification			
<input type="radio"/> Other: (textbox)			

4.2. Engaging patients and/or caregivers

	Baseline	PY1	PY2
How does your practice engage patients/caregivers in your efforts to redesign or improve your practice? (Select all that apply)	X	X	X
<input type="radio"/> We do not engage patients/caregivers to advise in practice improvement activities			
<input type="radio"/> Patient and Family Advisory Council			
<input type="radio"/> Focus groups			
<input type="radio"/> Patient surveys			
<input type="radio"/> Participation on improvement committees or workgroups			
<input type="radio"/> Other: (textbox)			

Chapter 5. Planned care and population health

5.1. Continuous quality improvement

	Baseline	PY1	PY2
Practitioners or care teams in our practice receive and review clinical quality, health care utilization, cost, and other outcomes data for their patients:		X	X
<input type="radio"/> Weekly			
<input type="radio"/> Monthly			
<input type="radio"/> Quarterly			
<input type="radio"/> Semiannually			
<input type="radio"/> Annually			
<input type="radio"/> Never			

5.2. Team-based care

	Baseline	PY1	PY2
Care team members in our practice meet to plan care for your high-need or high-risk patients under care management:	X	X	X
<input type="radio"/> Never <input type="radio"/> Only as needed or ad hoc <input type="radio"/> At least daily <input type="radio"/> At least weekly <input type="radio"/> At least monthly			

Chapter 6. General model questions

6.1. Instruction

	Baseline	PY1	PY2
The following questions are for assessing whether PCF achieves its overall goals. Please respond with your <u>candid answers and opinions</u> so that PCF can be clearly and fully understood. The answers to these questions will <u>not</u> be used to determine any type of PCF status or payment. All questions must be answered before you will be allowed to submit this section.	X	X	X
* Note: wording of this introduction varied slightly across rounds			

6.2. Primary reason for participation/assessing if PCF achieves its goals

	Baseline	PY1	PY2
What is the <u>primary reason</u> your practice site is participating in PCF?	X		
SELECT ONE ONLY			
<input type="radio"/> Improve quality of care <input type="radio"/> Be at the forefront of primary care transformation <input type="radio"/> Increase practice revenue <input type="radio"/> Align with other value-based purchasing initiatives or efforts <input type="radio"/> The decision was made by leadership <input type="radio"/> Other (please describe) (textbox)			

	Baseline	PY1	PY2				
PY1: Here are some goals that practices had in choosing to participate in PCF (including the SIP component, as applicable). For each one, please indicate if you feel that your practice site has achieved each of these goals so far during your participation in PCF.		X					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Yes, a great deal</td> <td style="width: 25%;">Yes, to some extent</td> <td style="width: 25%;">Not so far, but it is a goal</td> <td style="width: 25%;">Not a goal</td> </tr> </table>	Yes, a great deal	Yes, to some extent	Not so far, but it is a goal	Not a goal		X	
Yes, a great deal	Yes, to some extent	Not so far, but it is a goal	Not a goal				

Appendix B.6. Items asked in the PCF Practice Portal

					Baseline	PY1	PY2
PY2: Here are some goals that practices reported as reasons for participating in PCF. For each one, please indicate if you feel that your practice site has achieved the goal during your participation in PCF to date.							X
Yes, a great deal	Yes, to some extent	Not so far, but it is a goal	No longer a goal	Never a goal			X
a) Improved quality of care						X	X
b) Been at the forefront of primary care transformation						X	X
c) Increased practice revenue						X	X
d) Aligned with other value-based payment initiatives or efforts						X	X
e) Other goals you've targeted (please describe) [500 characters]						X	
f) Lowering hospitalizations							X
g) Lowering costs to the Medicare program							X

6.3. Changes to care delivery

				Baseline	PY1	PY2
Baseline: In the first year of your participation in PCF, do you expect to make any of the following changes to care delivery at your practice site?				X		
YES, change likely in the first year	NO, change not needed in the first year	NO, though change may be needed (insufficient resources or other barriers)	DON'T KNOW/ UNSURE	X		
Y1: Primary care practices started PCF with different capabilities to implement the model; there is no expectation that every practice will make the same or all these changes. So far in your first year of participation in PCF, have you made any of the following changes at your practice site?					X	
YES, change completed	YES, in process, currently working on the change	NO, though change may be needed (insufficient resources or other barriers)	NO, because change not needed		X	

Appendix B.6. Items asked in the PCF Practice Portal

				Baseline	PY1	PY2
<p>PY2: Primary care practices started PCF with different capabilities to implement the model; there is no expectation that every practice will make the same changes or all the changes listed below.</p> <p>During the past year of your participation in PCF, to what extent have you made the following changes at your practice site?</p>						X
A great deal of change	Some change	No change, though change may be needed (insufficient resources or other barriers)	No change because change not needed			X
<p>* Note: the wording in the rows shown below are from PY1; the wording in other rounds varied slightly in some rows. Also note that lettering does not match any particular round because some questions were not fielded in all rounds and some were in a different order.</p>						
STAFFING						
n. Added more practitioners (MD/DO, CNS, NP, or PA)				X	X	
o. Added more medical assistants, nurses, or care managers				X	X	
p. Added behavioral health staff or in some other way enhance behavioral health integration at our practice site				X	X	
q. Reorganized roles or responsibilities of existing staff					X	
ACCESS						
r. Increased patient access to practitioners via billable care (e.g., extended office hours, home visits)				X	X	X
s. Increased patient access to practitioners via non-billable care (e.g., patient portal, email)				X	X	X
t. Scheduled longer appointments for more complex patients who needed it				X	X	X
u. Educated patients and caregivers about alternatives to the emergency department (ED)				X	X	X
CARE MANAGEMENT						
v. Improved or expanded care management processes to help patients manage their medical conditions between visits				X	X	X
w. Improved or expanded ability to be notified when a patient has a hospital discharge or ED visit				X	X	X
x. Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit				X	X	X
y. Improved or expanded comprehensive medication management for high-risk patients						X
z. Changed opioid prescribing behavior						X

Appendix B.6. Items asked in the PCF Practice Portal

	Baseline	PY1	PY2
COMPREHENSIVENESS AND COORDINATION			
aa. Expanded the types of medical services provided at the practice site to reduce referrals to specialty care (for example, mole removal for biopsy to reduce referrals to dermatologists)	X	X	X
bb. Improved coordination with specialists	X	X	X
cc. Improved coordination with other providers (for example, home health agencies, hospice agencies, pharmacists, durable medical equipment suppliers)	X	X	X
dd. Reduced use of lower-value tests or other services that on average provide little or no clinical benefit	X	X	X
ee. Increased screening for patients' social needs (for example, housing, transportation, food)	X	X	X
ff. Improved coordination with community resources to meet patients' social needs (for example, housing, transportation, food)	X	X	X
gg. Improved handoffs to new primary care provider when a patient leaves the practice	X	X	X
BEHAVIORAL HEALTH			
hh. Added behavioral health staff			X
ii. Increased offering of care management to address behavioral health			X
jj. Improved integration of behavioral health into the primary care workflow			X
kk. Improved coordination with behavioral health providers outside the practice			X
PATIENT AND CAREGIVER ENGAGEMENT			
ll. Implemented or improved a process for patients and caregivers to advise practice improvement (such as surveys of patients or a Patient and Family Advisory Council)		X	X
CARE FOR SERIOUSLY ILL AND OTHER COMPLEX PATIENTS			
mm. Initiated or increased contact with patients potentially at risk for hospitalizations or ED visits who have not had a recent contact with our practice	X	X	X
nn. Increased access to palliative care (for example, referrals to palliative care, training our staff in palliative care, or adding palliative care practitioner to our practice)	X	X	X
oo. Improved advance care planning (for example, discussing or documenting end-of-life care preferences)	X	X	X
pp. Developed or updated care plans (a structured, personalized plan of care, developed with patient input) for seriously ill and other complex, chronically ill patients	X	X	X
HEALTH IT AND DATA FEEDBACK			
qq. Enhanced health information technology capabilities (for example, upgraded EHR/EMR functionality, added or improved telehealth technology, or other health IT changes)	X	X	X
rr. Increased use of available data to improve care delivery (for example, reviewing patient-level claims data or internal reports)	X	X	X

Appendix B.6. Items asked in the PCF Practice Portal

	Baseline	PY1	PY2
<p>For which Medicare FFS PCF beneficiaries are you currently providing cost sharing support? [check all that apply]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Beneficiaries experiencing financial hardship <input type="checkbox"/> Beneficiaries with high disease burden <input type="checkbox"/> Beneficiaries with a recent hospitalization or ED visit <input type="checkbox"/> Other (Please describe:) (textbox) 		X	
<p>CMS is allowing PCF practices and practitioners to provide in-kind items and services to Medicare FFS PCF beneficiaries in order to advance a clinical goal or to support preventive care under certain circumstances. Examples of in-kind items and services include, but are not limited to, covering the cost of health-related transportation services or providing free medical supplies not otherwise covered by Medicare.</p> <p><u>As part of your PCF participation</u>, is your practice currently providing <u>in-kind items or services</u> for any Medicare FFS PCF beneficiaries attributed to the practice?</p> <ul style="list-style-type: none"> <input type="radio"/> Yes <input type="radio"/> No → Skip next question <input type="radio"/> Not sure → Skip next question 		X	
<p>Please describe the types of in-kind items and services your practice provides to Medicare FFS PCF beneficiaries. (textbox)</p>		X	
<p>Coverage of diabetic shoes under current Medicare regulations requires a physician to certify that a patient has diabetes and has a therapeutic need for diabetic shoes. PCF is allowing a waiver that would allow <u>nurse practitioners</u> to certify the need for diabetic shoes.</p> <p>Is your practice currently using this waiver to allow nurse practitioners to certify the need for diabetic shoes?</p> <ul style="list-style-type: none"> <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not sure 		X	X (moved to the end of section 1.2)

6.7. Practice site management

	Baseline	PY1	PY2
<p>Which of the following does your practice site typically do when introducing new medically-complex patients to your practice? (Select all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Conduct a complete health assessment using a health assessment instrument <input type="checkbox"/> Conduct a palliative care assessment using a palliative care assessment instrument <input type="checkbox"/> Conduct a social needs assessment <input type="checkbox"/> Conduct a visit in the home <input type="checkbox"/> Conduct a meeting with caregivers <input type="checkbox"/> Conduct patient education such as self-management of chronic conditions 		X	

Appendix B.6. Items asked in the PCF Practice Portal

	Baseline	PY1	PY2
<input type="checkbox"/> Conduct patient education on best approaches to handle urgent care needs and use of the ED <input type="checkbox"/> Begin creating care plan <input type="checkbox"/> Obtain health records from previous primary care provider <input type="checkbox"/> Obtain health records from previous or current specialists/mental health providers <input type="checkbox"/> Obtain health records from recent acute care stay/ED visit <input type="checkbox"/> Other (please describe) (textbox) <input type="checkbox"/> None of the above			
<p>Overall, considering the amount of work required by PCF, how adequate or inadequate are the PCF payments from CMS in supporting changes to better manage the care of patients?</p> <p><input type="radio"/> More than adequate</p> <p><input type="radio"/> Adequate</p> <p><input type="radio"/> Less than adequate</p> <p><input type="radio"/> Don't know – not familiar with PCF payments or financial aspects of the practice</p>		X	Asked in a later section in PY2
<p>PY1: At your practice site, who <u>leads or champions</u> the implementation of PCF?</p> <p>SELECT ALL THAT APPLY</p> <p><input type="checkbox"/> Practicing physician (sees patients)</p> <p><input type="checkbox"/> Non-practicing physician (does not see patients)</p> <p><input type="checkbox"/> Nurse practitioner (NP)</p> <p><input type="checkbox"/> Clinical nurse specialist (CNS)</p> <p><input type="checkbox"/> Physician assistant (PA)</p> <p><input type="checkbox"/> Practice manager</p> <p><input type="checkbox"/> Another staff member at our practice site (please describe:) (textbox)</p> <p><input type="checkbox"/> System-level leadership or staff person who is not based at our practice site</p> <p><input type="checkbox"/> Our practice site does not have a PCF lead or champion</p> <p><input type="checkbox"/> Don't know</p>		X	
<p>PY2: Who <u>leads or champions</u> the implementation of PCF strategies for your practice site?</p> <p>SELECT ALL THAT APPLY</p> <p><input type="checkbox"/> Physician</p> <p><input type="checkbox"/> Nurse practitioner (NP)</p> <p><input type="checkbox"/> Clinical nurse specialist (CNS)</p> <p><input type="checkbox"/> Physician assistant (PA)</p> <p><input type="checkbox"/> Practice manager</p> <p><input type="checkbox"/> Quality lead or quality specialist</p>			X

Appendix B.6. Items asked in the PCF Practice Portal

	Baseline	PY1	PY2					
<input type="checkbox"/> Another staff member at our practice site (please describe: _____) (textbox) <input type="checkbox"/> Our practice site does not have a PCF lead or champion <i>(Skip if your practice site does not have a PCF lead or champion)</i> Is your PCF lead or champion, or are any of your PCF leads or champions, <u>located at your practice site?</u> <input type="radio"/> Yes <input type="radio"/> No								
PY1: Thinking about the <u>practicing physician who leads/champions</u> the implementation of PCF at your practice site, please select the response for each row that most closely describes this practitioner’s activities on PCF. PY2: Thinking about the physician who leads/champions the implementation of PCF strategies at your practice site, please select the response for each row that most closely describes this physician’s activities on PCF.		X	X					
<table border="1"> <tr> <td>Never</td> <td>Rarely</td> <td>Sometimes</td> <td>Often</td> <td>Always</td> </tr> </table>	Never	Rarely	Sometimes	Often	Always			
Never	Rarely	Sometimes	Often	Always				
a. Physician lead/champion at my practice site is knowledgeable about PCF advanced primary care functions		X	X					
b. Physician lead/champion at my practice site actively incorporates PCF advanced primary care functions into regular use		X	X					
c. Physician lead/champion at my practice site provides leadership to practice staff in PCF implementation		X	X					
Now, thinking of the different types of staff at your practice site, how often are they involved in implementing [Round 3: strategies for] PCF?		X	X					
<table border="1"> <tr> <td>Never</td> <td>Rarely</td> <td>Sometimes</td> <td>Often</td> <td>Always</td> </tr> </table>	Never	Rarely	Sometimes	Often	Always			
Never	Rarely	Sometimes	Often	Always				
a. Other physicians		X	X					
b. Nurse practitioners (NPs), clinical nurse specialists (CNSs), or physician assistants (PAs)		X	X					
c. Clinical support staff		X	X					
d. Clerical support staff		X	X					
e. Practice manager		X	X					
f. Quality lead or quality specialist			X					
g. Care manager			X					
h. Social workers or psychologists			X					
i. System level staff (if applicable)		X	X					

				Baseline	PY1	PY2
Thinking about your practice site, please select how much you agree or disagree with each of the following statements.					X	
Strongly agree	Agree	Disagree	Strongly Disagree			
a. Practitioners can easily communicate any ideas and/or concerns they may have to practice leadership.					X	
b. Practice leadership is responsive to feedback from practitioners.					X	
c. Practitioners have adequate input into decisions that affect how they practice medicine.					X	

Health system

				Baseline	PY1	PY2
Is your practice part of a larger health care delivery organization?						X
<input type="radio"/> Yes, part of a larger health care delivery organization that includes a hospital (sometimes called a "health system")						
<input type="radio"/> Yes, part of a larger health care delivery organization that does <u>not</u> include a hospital						
<input type="radio"/> No, not part of any larger health care delivery organization (sometimes called an "independent practice") → Skip next question						
If your practice site wanted to change a care delivery process or workflow related to PCF, who would need to be involved in the decision to change the process or workflow?						X
<input type="radio"/> Decision made entirely by practice staff/leadership at this practice site						
<input type="radio"/> Decision made by a combination of practice staff/leadership at this practice site and staff/leadership from the larger health care delivery organization						
<input type="radio"/> Decision made entirely by staff/leadership from the larger health care delivery organization						
<input type="radio"/> Not sure						
<input type="radio"/> Practice is independent and not part of a larger health care delivery organization						
In some organizations, care managers work out of a centralized location to support numerous practices. In other organizations, the care manager works on-site in a specific practice or two. Which of the following best describes the work location of care managers who support your patients?						X
<input type="radio"/> Care managers mostly work from a centralized location						
<input type="radio"/> Care managers are located mostly at our practice site						
<input type="radio"/> Care managers work mostly from home (may come into the practice sometimes)						
<input type="radio"/> We do not use care managers						

Value-based purchasing

	Baseline	PY1	PY2					
<p>Does this practice site participate in other value-based programs (for example, through a public or commercial insurer or as part of an ACO, including the Medicare Shared Savings Program)?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No → skip next two questions</p>			X					
Please list the value-based programs your practice site participates in. (textbox)			X					
<p>To what extent do you agree or disagree with the following statements:</p> <table border="1"> <tr> <td>Strongly agree</td> <td>Agree</td> <td>Disagree</td> <td>Strongly Disagree</td> <td>Don't Know</td> </tr> </table>	Strongly agree	Agree	Disagree	Strongly Disagree	Don't Know			X
Strongly agree	Agree	Disagree	Strongly Disagree	Don't Know				
a. Our practice site has made care delivery changes to support both PCF and other value-based initiatives at the same time			X					
b. Our practice site has made care delivery changes specifically for PCF			X					

Overall impressions

	Baseline	PY1	PY2					
<p>As a reminder, please respond with your <u>candid answers and opinions</u> so CMS can clearly and fully understand the experiences of PCF practices.</p> <p>Thinking about your practice site's experience with <u>PCF's attribution methodology</u>, please indicate how much you agree or disagree with the following statements.</p> <table border="1"> <tr> <td>Strongly agree</td> <td>Agree</td> <td>Disagree</td> <td>Strongly Disagree</td> <td>Don't Know</td> </tr> </table>	Strongly agree	Agree	Disagree	Strongly Disagree	Don't Know			X
Strongly agree	Agree	Disagree	Strongly Disagree	Don't Know				
a. Our practice <u>understands</u> the attribution methodology			X					
b. Our practice feels that the attribution methodology <u>is fair</u>			X					
OPTIONAL: If you'd like to say more about your responses above, please do so here. (textbox)			X					
<p>Thinking about your practice site's experience with <u>PCF's risk group assignment</u>, please indicate how much you agree or disagree with the following statements.</p> <table border="1"> <tr> <td>Strongly agree</td> <td>Agree</td> <td>Disagree</td> <td>Strongly Disagree</td> <td>Don't Know</td> </tr> </table>	Strongly agree	Agree	Disagree	Strongly Disagree	Don't Know			X
Strongly agree	Agree	Disagree	Strongly Disagree	Don't Know				
a. Our practice <u>understands</u> the risk group assignment process			X					
b. Our practice feels that the risk group assignment process <u>is fair</u>			X					
OPTIONAL: If you'd like to say more about your responses above, please do so here. (textbox)			X					

Appendix B.6. Items asked in the PCF Practice Portal

	Baseline	PY1	PY2					
Thinking about your practice site's experience with <u>PCF's performance-based adjustment</u> , please indicate how much you agree or disagree with the following statements.			X					
<table border="1"> <tr> <td>Strongly agree</td> <td>Agree</td> <td>Disagree</td> <td>Strongly Disagree</td> <td>Don't Know</td> </tr> </table>	Strongly agree	Agree	Disagree	Strongly Disagree	Don't Know			
Strongly agree	Agree	Disagree	Strongly Disagree	Don't Know				
a. Our practice <u>understands</u> how the performance-based adjustment is calculated			X					
b. Our practice feels that the performance-based adjustment methodology <u>is fair</u>			X					
OPTIONAL: If you'd like to say more about your responses above, please do so here. (textbox)			X					
Thinking about your practice site's experience with PCF's <u>payment accuracy adjustment</u> , please indicate how much you agree or disagree with the following statements.			X					
<table border="1"> <tr> <td>Strongly agree</td> <td>Agree</td> <td>Disagree</td> <td>Strongly Disagree</td> <td>Don't Know</td> </tr> </table>	Strongly agree	Agree	Disagree	Strongly Disagree	Don't Know			
Strongly agree	Agree	Disagree	Strongly Disagree	Don't Know				
a. Our practice <u>understands</u> how the payment accuracy adjustment is calculated			X					
b. Our practice feels that the payment accuracy adjustment methodology <u>is fair</u>			X					
OPTIONAL: If you'd like to say more about your responses above, please do so here. (textbox)			X					
Overall, considering the amount of work required by PCF, how adequate or inadequate are the PCF payments from CMS in supporting changes to better manage the care of patients? <input type="radio"/> More than adequate <input type="radio"/> Adequate <input type="radio"/> Less than adequate <input type="radio"/> Don't know – not familiar with PCF payments or financial aspects of the practice		Asked in an earlier section in PY1	X					
Overall, how burdensome does your practice find the requirements of PCF? <input type="radio"/> Very burdensome <input type="radio"/> Somewhat burdensome <input type="radio"/> Not very burdensome <input type="radio"/> Not at all burdensome			X					
Given this practice site's overall experience participating in PCF so far, how likely is it that this practice site would participate in PCF if you could do it all over again? <input type="radio"/> Very likely <input type="radio"/> Somewhat likely <input type="radio"/> Not very likely <input type="radio"/> Not at all likely			X					

Health equity

	Baseline	PY1	PY2
<p>What are health inequities? Health inequities are systematic and avoidable differences in the health of different population groups. Recent research has raised awareness about the persistent health inequities that people of color, indigenous people, rural communities, individuals with socioeconomic challenges, and other historically marginalized groups continue to face. Health inequities have deep roots in our society, and neither primary care nor the broader health care system can provide the only solution for overcoming barriers that prevent healthy outcomes. However, primary care can still play a vital role in reducing health inequities.</p> <p>Why are we asking you questions about health inequities? While reducing health inequities was not an explicit goal of Primary Care First, it is an emerging priority area for CMS. Please note that CMS has no expectations as to whether you are doing any work related to health equity. Rather, the goal of these questions is to gauge the readiness of PCF practices to engage in health equity work. We appreciate your honest responses.</p>			X
<p>Collecting data on patient characteristics can help practices identify differences in health outcomes or hospital/emergency department (ED) utilization across their patient population. Does your practice systematically collect data on any of the following patient characteristics? Select all that apply.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Race <input type="checkbox"/> Ethnicity <input type="checkbox"/> Primary spoken language <input type="checkbox"/> Disability status <input type="checkbox"/> Gender identity <input type="checkbox"/> Sexual orientation <input type="checkbox"/> Other: Please specify (textbox) <input type="checkbox"/> None of the above → skip next question 			X
<p>Thinking about the data your practice collects on patient characteristics you reported in item above, does your practice <u>use any of these patient characteristics data to look for differences</u> in health outcomes or hospital/ED utilization?</p> <ul style="list-style-type: none"> <input type="radio"/> Yes <input type="radio"/> No → skip next 3 questions 			X
<p>Please describe how your practice is using patient characteristics data to look for differences in health outcomes or hospital/ED utilization and what you have found. (textbox)</p>			X
<p>Has your practice taken any actions or implemented any interventions <u>to address these differences</u> in health outcomes or hospital/ED utilization?</p> <ul style="list-style-type: none"> <input type="radio"/> Yes <input type="radio"/> No → skip next question 			X
<p>Please describe what your practice is doing to address these differences. (textbox)</p>			X

Appendix B.6. Items asked in the PCF Practice Portal

	Baseline	PY1	PY2
<p>What do you see as the primary barriers to your practice being able to better identify or address health inequities? Select all that apply.</p> <ul style="list-style-type: none"> <input type="checkbox"/> We need more or better tools for <u>collecting or recording</u> patient characteristic data <input type="checkbox"/> We need more or better tools for <u>analyzing or summarizing</u> data on health outcomes or hospital/ED utilization <input type="checkbox"/> We need more or better information on how to review data and identify health inequities <input type="checkbox"/> We need more or better information on effective approaches primary care practices can take to reduce health inequities <input type="checkbox"/> We need additional staff time or funding to implement interventions to reduce health inequities <input type="checkbox"/> Other barriers (please specify _____) (textbox) <input type="checkbox"/> None of the above 			X
<p>Is there someone at your practice or at your larger health care delivery organization that is charged with leading efforts to address health inequities? Select all that apply.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes, someone at our practice <input type="checkbox"/> Yes, someone at the larger health care delivery organization <input type="checkbox"/> No → skip next question <input type="checkbox"/> I don't know → skip next question 			X
<p>Please provide the position and/or title of the person leading efforts to reduce health inequities: (textbox)</p>			X
<p>How much, if at all, has participation in PCF influenced whether your practice is engaged in or considering ways to address health inequities?</p> <ul style="list-style-type: none"> <input type="radio"/> Not at all influenced → skip next question <input type="radio"/> Influenced somewhat <input type="radio"/> Strongly influenced 			X
<p>Please describe how participating in PCF has influenced whether your practice is engaged in or considering ways to address health inequities. (textbox)</p>			X

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Exhibit B.7.1. Overall frequencies for PCF Practice Portal items in Performance Year 1 Care delivery items

Question	Overall count (N = 2,945)	Overall percentage
Does your practice provide 24/7 access to care informed, when necessary, by real-time access to the patient's EHR?		
No	22	1%
Yes	2,921	99%
Missing	2	0%
When patients need it, my practice is able to provide... same day or next day appointments.		
Never	2	0%
Rarely	9	0%
Sometimes	213	7%
Often	1,375	47%
Always	1,344	46%
Missing	2	0%
When patients need it, my practice is able to provide... office visits on the weekend, evening, or early morning,		
Never	306	10%
Rarely	208	7%
Sometimes	784	27%
Often	814	28%
Always	831	28%
Missing	2	0%
When patients need it, my practice is able to provide... email or portal advice on clinical issues		
Never	9	0%
Rarely	31	1%
Sometimes	221	8%
Often	593	20%
Always	2,089	71%
Missing	2	0%
How does your practice manage timely callbacks to high-risk patients with complex needs and/or seriously ill patients?		
We have not established protocols or pathways to ensure timely callbacks	40	1%
We are in process of developing protocols or pathways	179	6%
We have basic protocols or pathways	1,672	57%
We have specific protocols or pathways	1,051	36%
Missing	3	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
How does your practice use the payment flexibility in this model to provide enhanced access? (Select all that apply)		
a. We do not provide any enhanced access approaches		
Yes	38	1%
No	2,904	99%
Missing	3	0%
b. Visits to hospitals, nursing facilities, or other locations by any staff as part of care management and coordination		
Yes	798	27%
No	2,144	73%
Missing	3	0%
c. Practitioner visits in alternate locations, including home-based visits		
Yes	658	22%
No	2,284	78%
Missing	3	0%
d. Visits in the home by designated staff for care management activities, home assessments, education, or self-management support		
Yes	537	18%
No	2,405	82%
Missing	3	0%
e. Practice group visits for purposes of disease management, self-management, and other support		
Yes	401	14%
No	2,541	86%
Missing	3	0%
f. Video-based conferencing for primary care visits (e.g., telehealth or telemedicine)		
Yes	2,702	92%
No	240	8%
Missing	3	0%
g. Visit over an electronic exchange (phone or, e-visit, portal, email)		
Yes	2,516	85%
No	426	14%
Missing	3	0%
h. Patient outreach by community health worker, health coach, and/or caregiver support staff		
Yes	1,792	61%
No	1,150	39%
Missing	3	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
i. Activities that support the family/caregiver		
Yes	699	24%
No	2,243	76%
Missing	3	0%
j. Other		
Yes	176	6%
No	2,766	94%
Missing	3	0%
Which model beneficiary engagement incentives is your practice providing to your Medicare beneficiaries? (Select all that apply)		
a. None		
Yes	1,982	67%
No	960	33%
Missing	3	0%
b. Reduced or waived applicable co-insurance for PCF flat visit fees		
Yes	92	3%
No	2,850	97%
Missing	3	0%
c. Transportation (e.g., practice-operated van or vouchers for ride sharing services for face-to-face care)		
Yes	522	18%
No	2,420	82%
Missing	3	0%
d. Nutrition (e.g., food vouchers, Meals on Wheels services, Weight Watchers classes)		
Yes	393	13%
No	2,549	87%
Missing	3	0%
e. Medical equipment (e.g., blood pressure equipment; remote monitoring devices)		
Yes	572	19%
No	2,370	80%
Missing	3	0%
To which of the following categories of beneficiaries and/or types of clinical needs is your practice providing these beneficiary engagement incentives? (Select all that apply)		
IF: Reduced or waived applicable co-insurance for PCF flat visit fees		
a. Medicare beneficiaries with financial needs		
Yes	61	2%
No	41	1%
Missing	2,843	96%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
b. Medicare beneficiaries with complex health needs		
Yes	11	0%
No	91	3%
Missing	2,843	96%
c. Medicare beneficiaries with recent hospitalization(s) or Emergency Department (ED) visits		
Yes	8	0%
No	94	3%
Missing	2,843	96%
d. All of the above		
Yes	40	1%
No	62	2%
Missing	2,843	96%
e. Other		
Yes	2	0%
No	100	3%
Missing	2,843	96%
IF: Transportation (e.g., practice-operated van or vouchers for ride sharing services for face-to-face care)		
a. With financial need		
Yes	200	7%
No	325	11%
Missing	2,420	82%
b. With complex health needs		
Yes	106	4%
No	419	14%
Missing	2,420	82%
c. With recent hospitalization(s) and/or ED visits		
Yes	87	3%
No	438	15%
Missing	2,420	82%
d. All of the above		
Yes	295	10%
No	230	8%
Missing	2,420	82%
e. Other		
Yes	28	1%
No	497	17%
Missing	2,420	82%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
IF: Nutrition (e.g., food vouchers, Meals on Wheels services, Weight Watchers classes)		
a. With financial need		
Yes	138	5%
No	255	9%
Missing	2,552	87%
b. With complex health needs		
Yes	111	4%
No	282	10%
Missing	2,552	87%
c. With recent hospitalization(s) and/or ED visits		
Yes	84	3%
No	309	10%
Missing	2,552	87%
d. All of the above		
Yes	234	8%
No	159	5%
Missing	2,552	87%
e. Other		
Yes	19	1%
No	374	13%
Missing	2,552	87%
IF: Medical equipment (e.g., blood pressure equipment; remote monitoring devices)		
a. With financial need		
Yes	173	6%
No	400	14%
Missing	2,372	80%
b. With complex health needs		
Yes	292	10%
No	281	10%
Missing	2,372	80%
c. With recent hospitalization(s) and/or ED visits		
Yes	139	5%
No	434	15%
Missing	2,372	80%
d. All of the above		
Yes	219	7%
No	354	12%
Missing	2,372	80%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
e. Other		
Yes	44	2%
No	529	18%
Missing	2,372	80%
What percentage of patients are empaneled to a practitioner or care team?		
None (0%)	12	0%
Some (<50% of all patients)	51	2%
Most (50-95%)	886	30%
All (95-100%)	1,993	68%
Missing	3	0%
Please provide the current number of active patients the practice is currently seeing.		
0-2,499	861	29%
2,500-4,999	814	28%
5,000-7,499	532	18%
7,500-9,999	319	11%
10,000+	416	14%
Missing	3	0%
On average, what percentage of a patient's face-to-face visits are provided by their empaneled practitioner or care team?		
None (0%)	4	0%
Some (<50% of all patients)	64	2%
Most (50-95%)	1,962	67%
All (95-100%)	912	31%
Missing	3	0%
Do you risk stratify your empaneled patients?		
Yes	2,840	96%
No	102	4%
Missing	3	0%
Is risk stratification integrated within your EHR or health information technology (IT) system?		
Yes	2,668	91%
No	274	9%
Missing	3	0%
Which of the following best describes your practice's risk stratification methodology?		
We use an EHR/IT-based, structured, data-driven algorithm	537	18%
We use clinical intuition and judgment	207	7%
We use both	2,198	75%
Missing	3	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
Which of the following best describes your practice's care management approach?		
Proactive, relationship-based (longitudinal) care management for patients identified as high need and/or high risk	61	2%
Short-term, goal-oriented episodic care management for patients who have acute or urgent needs	145	5%
Both	2,723	92%
None	13	0%
Missing	3	0%
How do you use documented, personalized care plans?		
For patients receiving care management only	1,346	46%
For patients identified as at high risk or increased complexity regardless of whether or not they receive care management services	743	25%
For SIP patients only (if a SIP practice).	1	0%
Varies based on practitioner preference	586	20%
Other	131	4%
We don't use documented, personalized care plans	135	5%
Missing	3	0%
Which of the following elements are included in your care planning process and personalized care plan that you develop with patients?		
a. Mutually agreed upon and developed with patient and family.		
Never	82	3%
Rarely	79	3%
Sometimes	237	8%
Often	933	32%
Always	1,611	55%
Missing	3	0%
b. Accessible to all team members providing care for the patient.		
Never	95	3%
Rarely	9	0%
Sometimes	53	2%
Often	499	17%
Always	2,286	78%
Missing	3	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
c. Accessible to the patient in clear, simple language to make it easier for the patient/caregiver to understand and use.		
Never	99	3%
Rarely	102	4%
Sometimes	185	6%
Often	820	28%
Always	1,736	59%
Missing	3	0%
d. Written care plan in clear, simple language for patient/caregiver to understand and use.		
Never	150	5%
Rarely	107	4%
Sometimes	271	9%
Often	837	28%
Always	1,577	54%
Missing	3	0%
Our personalized care plan contains the following information (Select all that apply)		
a. Patient's overall health or functional goals		
Yes	2,457	83%
No	485	16%
Missing	3	0%
b. Treatment goals specific to the patient's condition(s)		
Yes	2,637	90%
No	305	10%
Missing	3	0%
c. Advance directives and preferences for care		
Yes	1,765	60%
No	1,177	40%
Missing	3	0%
d. Key contact information for the practice and, if applicable, referral specialists		
Yes	2,188	74%
No	754	26%
Missing	3	0%
e. Key actions the patient will take and important contingencies (if/then) specific for the patient and their conditions		
Yes	2,244	76%
No	698	24%
Missing	3	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
f. Other		
Yes	265	9%
No	2,677	91%
Missing	3	0%
What type of clinicians and staff at your practice support your high-need and/or high risk patients (Select all that apply)		
a. Practitioner specializing in high-need patients		
Yes	1,310	44%
No	1,632	55%
Missing	3	0%
b. Care manager		
Yes	2,569	87%
No	373	13%
Missing	3	0%
c. Social worker		
Yes	1,756	60%
No	1,186	40%
Missing	3	0%
d. Behavioral health specialist		
Yes	1,463	50%
No	1,479	50%
Missing	3	0%
e. None of the above		
Yes	34	1%
No	2,908	99%
Missing	3	0%
Our practice routinely and proactively follows up with patients discharged from hospital:		
Yes—All patients	2,048	70%
Yes—Selectively, based on patient diagnosis, patient characteristics, and/or patient risk.	888	30%
No—We do not routinely and proactively follow up on patients discharged from hospital.	6	0%
Missing	3	0%
IF either YES --> Our practice follows up with patients discharged within:		
24 hours	153	5%
48 hours	1,929	66%
72 hours	674	23%
One week	106	4%
Two weeks	45	2%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
Unknown	29	1%
Missing	9	0%
Our practice routinely and proactively follows up with patients discharged from ED:		
Yes—All patients	1,616	55%
Yes—Selectively, based on patient diagnosis, patient characteristics, and/or patient risk.	1,244	42%
No—We do not routinely and proactively follow up on patients discharged from emergency department.	82	3%
Missing	3	0%
IF either YES --> Our practice follows up with patients discharged within:		
24 hours	146	5%
48 hours	804	27%
72 hours	441	15%
One week	1,353	46%
Two weeks	44	2%
Unknown	72	2%
Missing	85	3%
Our strategy for integrating behavioral health services into our practice is best described by the following:		
Behavioral Care Management or Collaborative Care Management	1,052	36%
Primary Care Behaviorist or co-located professional	796	27%
Blend of the two	684	23%
None, we do not integrate behavioral health into our practice	410	14%
Missing	3	0%
Our practice also uses these approaches for Behavioral Health Care: (Select all that apply)		
a. High-quality referral and coordination with behavioral health specialty care		
Yes	1,993	68%
No	949	32%
Missing	3	0%
b. Assess and track patient-reported outcomes for behavioral health conditions under active management (e.g., depression or anxiety)		
Yes	1,479	50%
No	1,463	50%
Missing	3	0%
c. No enhanced strategies beyond traditional referral		
Yes	686	23%
No	2,256	77%
Missing	3	0%

Question	Overall count (N = 2,945)	Overall percentage
d. Other		
Yes	146	5%
No	2796	95%
Missing	3	0%
Do you routinely screen your patients for health-related social needs?		
We screen a targeted subpopulation of patients for health-related social needs.	1,126	38%
We universally screen all patients for health-related social needs.	1,687	57%
We do not screen patients for health-related social needs.	129	4%
Missing	3	0%
Do you maintain an inventory of social services and supports to meet patients' health-related social needs that is integrated with your EHR or health IT system?		
No, we do not maintain an inventory of social service resources.	114	4%
Yes, we have an inventory of social service resources, but it is not integrated with our EHR or health IT system.	1,813	62%
Yes, we have an inventory of social service resources integrated with our EHR or health IT system.	1,015	34%
Missing	3	0%
Do you have an established, ongoing relationship with social or community resources to address the following health-related social needs? (Select all that apply)		
a. Food insecurity		
Yes	2,390	81%
No	552	19%
Missing	3	0%
b. Housing instability		
Yes	1,899	64%
No	1,043	35%
Missing	3	0%
c. Utility needs		
Yes	1,769	60%
No	1,173	40%
Missing	3	0%
d. Finance resources strain		
Yes	1,711	58%
No	1,231	42%
Missing	3	0%
e. Transportation		
Yes	2,358	80%
No	584	20%
Missing	3	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
f. Employment		
Yes	988	34%
No	1,954	66%
Missing	3	0%
g. Social isolation		
Yes	1,388	47%
No	1,554	53%
Missing	3	0%
h. Safety		
Yes	1,858	63%
No	1,084	37%
Missing	3	0%
i. Activities of daily living or chores services		
Yes	1,684	57%
No	1,258	43%
Missing	3	0%
j. Other		
Yes	308	10%
No	2,634	89%
Missing	3	0%
k. We do not have established, ongoing relationship with social or community resources.		
Yes	263	9%
No	2,679	91%
Missing	3	0%
Which best describes your practice's approach to ensure a coordinated referral management system for your high-need patient population (patients who are high-risk, complex, or seriously ill)? (Select all that apply)		
a. Our practice has established policies and procedures in place to ensure high-value referrals for specialty care and other care organizations.		
Yes	1,660	56%
No	1,282	44%
Missing	3	0%
b. Our practice uses data to determine high-volume and/or high-cost specialty providers.		
Yes	894	30%
No	2,048	70%
Missing	3	0%

Question	Overall count (N = 2,945)	Overall percentage
c. Our practice employs collaborative care agreements to facilitate effective coordination between practice and referral site.		
Yes	1,512	51%
No	1,430	49%
Missing	3	0%
d. Our practice employs eConsultations to facilitate effective coordination between practice and referral site.		
Yes	843	29%
No	2,099	71%
Missing	3	0%
e. Our practice employs other tools to facilitate effective coordination between practice and referral site		
Yes	781	26%
No	2,161	73%
Missing	3	0%
How does your practice identify patients for advance care planning? (Select all that apply)		
a. We do not systematically identify patients for advance care planning		
Yes	43	2%
No	2,901	98%
Missing	1	0%
b. High-risk status (using the practice's risk stratification methodology)		
Yes	1,303	44%
No	1,641	56%
Missing	1	0%
c. Patients with serious illness and/or based on age (e.g., cancer diagnosis, end-stage kidney disease, heart failure, COPD)		
Yes	2,045	69%
No	899	30%
Missing	1	0%
d. Clinician or care team referral/identification		
Yes	2,211	75%
No	733	25%
Missing	1	0%
e. Other		
Yes	678	23%
No	2,266	77%
Missing	1	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
How does your practice engage patients/caregivers in your efforts to redesign or improve your practice? (Select all that apply)		
a. We do not engage patients/caregivers to advise in practice improvement activities.		
Yes	75	2%
No	2,867	97%
Missing	3	0%
b. Patient and Family Advisory Council		
Yes	1,200	41%
No	1,742	59%
Missing	3	0%
c. Focus groups		
Yes	246	8%
No	2,696	92%
Missing	3	0%
d. Patient surveys		
Yes	2,735	93%
No	207	7%
Missing	3	0%
e. Participation on improvement committees or workgroups		
Yes	448	15%
No	2,494	85%
Missing	3	0%
f. Other		
Yes	172	6%
No	2,770	94%
Missing	3	0%
Practitioners or care teams in our practice receive and review clinical quality, health care utilization, cost, and other outcomes data for their patients:		
Weekly	287	10%
Monthly	1,937	66%
Quarterly	583	20%
Semiannually	52	2%
Annually	24	1%
Never	59	2%
Missing	3	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,945)	Overall percentage
Care team members in our practice meet to plan care for your high-need and/or high risk patients under care management:		
Never	31	1%
Only as needed or ad hoc	1,239	42%
At least daily	334	11%
At least weekly	652	22%
At least monthly	686	23%
Missing	3	0%

Exhibit B.7.2. General Model items

Question	Overall count (N = 2,941)	Overall percentage
Here are some goals that practices had in choosing to participate in PCF (including the SIP component, as applicable). For each one, please indicate if you feel that your practice site has achieved each of these goals so far during your participation in PCF.		
a. Improved quality of care		
Yes, a great deal	499	17%
Yes, to some extent	2,215	75%
Not so far, but it is a goal	214	7%
Not a goal	13	0%
Missing	0	0%
b. Been at the forefront of primary care transformation		
Yes, a great deal	672	23%
Yes, to some extent	1,810	62%
Not so far, but it is a goal	407	14%
Not a goal	52	2%
Missing	0	0%
c. Increased practice revenue		
Yes, a great deal	192	6%
Yes, to some extent	1,426	48%
Not so far, but it is a goal	1,066	36%
Not a goal	257	9%
Missing	0	0%
d. Aligned with other value-based payment initiatives or efforts		
Yes, a great deal	910	31%
Yes, to some extent	1,642	56%
Not so far, but it is a goal	247	8%
Not a goal	142	5%
Missing	0	0%
So far in your first year of participation in PCF, have you made any of the following changes at your practice site?		
a. Added more practitioners (MD, DO, CNS, NP, or PA)		
Yes, change completed	344	12%
Yes, in process, currently working on the change	786	27%
No, though change may be needed (insufficient resources or other barriers)	874	30%
No, because change not needed	937	32%
Missing	0	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,941)	Overall percentage
b. Added more medical assistants, nurses, or care managers		
Yes, change completed	601	20%
Yes, in process, currently working on the change	917	31%
No, though change may be needed (insufficient resources or other barriers)	951	32%
No, because change not needed	472	16%
Missing	0	0%
c. Added behavioral health staff or in some other way enhance behavioral health integration at our practice site		
Yes, change completed	443	15%
Yes, in process, currently working on the change	884	30%
No, though change may be needed (insufficient resources or other barriers)	997	34%
No, because change not needed	617	21%
Missing	0	0%
d. Reorganized roles or responsibilities of existing staff		
Yes, change completed	453	15%
Yes, in process, currently working on the change	1,428	49%
No, though change may be needed (insufficient resources or other barriers)	433	15%
No, because change not needed	627	21%
Missing	0	0%
e. Increased patient access to practitioners via billable care (for example, extended office hours, home visits)		
Yes, change completed	532	18%
Yes, in process, currently working on the change	797	27%
No, though change may be needed (insufficient resources or other barriers)	759	26%
No, because change not needed	853	29%
Missing	0	0%
f. Increased patient access to practitioners via non-billable care (for example, patient portal, email)		
Yes, change completed	702	24%
Yes, in process, currently working on the change	930	32%
No, though change may be needed (insufficient resources or other barriers)	334	11%
No, because change not needed	975	33%
Missing	0	0%
g. Scheduled longer appointments for more complex patients who need it		
Yes, change completed	706	24%
Yes, in process, currently working on the change	616	21%
No, though change may be needed (insufficient resources or other barriers)	624	21%
No, because change not needed	995	34%
Missing	0	0%
h. Educated patients and caregivers about alternatives to the ED		
Yes, change completed	832	28%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,941)	Overall percentage
Yes, in process, currently working on the change	1,415	48%
No, though change may be needed (insufficient resources or other barriers)	277	9%
No, because change not needed	417	14%
Missing	0	0%
i. Improved or expanded care management processes to help patients manage their medical conditions between visits		
Yes, change completed	691	24%
Yes, in process, currently working on the change	1,406	48%
No, though change may be needed (insufficient resources or other barriers)	434	15%
No, because change not needed	410	14%
Missing	0	0%
j. Improved or expanded ability to be notified when a patient has a hospital discharge or ED visit		
Yes, change completed	796	27%
Yes, in process, currently working on the change	947	32%
No, though change may be needed (insufficient resources or other barriers)	244	8%
No, because change not needed	954	32%
Missing	0	0%
k. Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit		
Yes, change completed	974	33%
Yes, in process, currently working on the change	1,090	37%
No, though change may be needed (insufficient resources or other barriers)	287	10%
No, because change not needed	590	20%
Missing	0	0%
l. Expanded the types of medical services provided at the practice site to reduce referrals to specialty care (for example, mole removal for biopsy to reduce referrals to dermatologists)		
Yes, change completed	220	8%
Yes, in process, currently working on the change	593	20%
No, though change may be needed (insufficient resources or other barriers)	927	32%
No, because change not needed	1,200	41%
Missing	1	0%
m. Improved coordination with specialists		
Yes, change completed	279	10%
Yes, in process, currently working on the change	1,315	45%
No, though change may be needed (insufficient resources or other barriers)	752	26%
No, because change not needed	594	20%
Missing	1	0%

Question	Overall count (N = 2,941)	Overall percentage
n. Improved coordination with other providers (for example, home health agencies, hospice agencies, pharmacists, durable medical equipment suppliers)		
Yes, change completed	395	13%
Yes, in process, currently working on the change	1,338	46%
No, though change may be needed (insufficient resources or other barriers)	641	22%
No, because change not needed	566	19%
Missing	1	0%
o. Reduced use of lower-value tests or other services that on average provide little or no clinical benefit		
Yes, change completed	267	9%
Yes, in process, currently working on the change	716	24%
No, though change may be needed (insufficient resources or other barriers)	842	29%
No, because change not needed	1,115	38%
Missing	1	0%
p. Increased screening for patients' social needs (for example, housing, transportation, food)		
Yes, change completed	669	23%
Yes, in process, currently working on the change	1,361	46%
No, though change may be needed (insufficient resources or other barriers)	439	15%
No, because change not needed	471	16%
Missing	1	0%
q. Improved coordination with community resources to meet patients' social needs (for example, housing, transportation, food)		
Yes, change completed	567	19%
Yes, in process, currently working on the change	1,423	48%
No, though change may be needed (insufficient resources or other barriers)	572	19%
No, because change not needed	378	13%
Missing	1	0%
r. Improved handoffs to new primary care provider when a patient leaves the practice		
Yes, change completed	236	8%
Yes, in process, currently working on the change	569	19%
No, though change may be needed (insufficient resources or other barriers)	863	29%
No, because change not needed	1,272	43%
Missing	1	0%
s. Implemented or improved a process for patients and caregivers to advise practice improvement (such as surveys of patients or a Patient and Family Advisory Council)		
Yes, change completed	718	24%
Yes, in process, currently working on the change	1,041	35%
No, though change may be needed (insufficient resources or other barriers)	535	18%
No, because change not needed	646	22%
Missing	1	0%

Question	Overall count (N = 2,941)	Overall percentage
t. Initiated or increased contact with patients potentially at risk for hospitalizations or ED visits who have not had a recent contact with our practice		
Yes, change completed	536	18%
Yes, in process, currently working on the change	1,298	44%
No, though change may be needed (insufficient resources or other barriers)	661	22%
No, because change not needed	445	15%
Missing	1	0%
u. Increased access to palliative care (for example, referrals to palliative care, training our staff in palliative care, or adding palliative care practitioner to our practice)		
Yes, change completed	270	9%
Yes, in process, currently working on the change	918	31%
No, though change may be needed (insufficient resources or other barriers)	1,123	38%
No, because change not needed	629	21%
Missing	1	0%
v. Improved advance care planning (for example, discussing or documenting end-of-life care preferences)		
Yes, change completed	625	21%
Yes, in process, currently working on the change	1,919	65%
No, though change may be needed (insufficient resources or other barriers)	160	5%
No, because change not needed	236	8%
Missing	1	0%
w. Developed or updated care plans (a structured, personalized plan of care, developed with patient input) for seriously ill and other complex, chronically ill patients		
Yes, change completed	523	18%
Yes, in process, currently working on the change	1,381	47%
No, though change may be needed (insufficient resources or other barriers)	436	15%
No, because change not needed	600	20%
Missing	1	0%
x. Enhance health information technology capabilities (for example, upgrade EHR/EMR functionality, add or improve telehealth technology, or other health IT changes)		
Yes, change completed	849	29%
Yes, in process, currently working on the change	1,386	47%
No, though change may be needed (insufficient resources or other barriers)	234	8%
No, because change not needed	471	16%
Missing	1	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,941)	Overall percentage
y. Increase use of available data to improve care delivery (for example, reviewing patient-level claims data or internal reports)		
Yes, change completed	571	19%
Yes, in process, currently working on the change	1,618	55%
No, though change may be needed (insufficient resources or other barriers)	388	13%
No, because change not needed	363	12%
Missing	1	0%
On a scale of 0 to 10, how challenging has it been for your practice site to reduce acute hospitalizations (risk group 1 or 2 practice) or total cost of care (risk group 3 or 4 practice) during your first year of participation in PCF?		
0 to 3 (not challenging)	126	4%
4 to 7 (somewhat challenging)	1,591	54%
8 to 10 (very challenging)	1,159	39%
Don't know	64	2%
M	1	0%
0 -Not at all challenging	14	0%
1	7	0%
2	29	1%
3	76	3%
4	169	6%
5	530	18%
6	231	8%
7	661	22%
8	578	20%
9	274	9%
10 -Extremely Challenging	307	10%
Don't know	64	2%
M	1	0%
Is your practice currently providing cost-sharing support for any Medicare FFS PCF beneficiaries attributed to the practice?		
Yes	172	6%
No	2,416	82%
Not sure	352	12%
Missing	1	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,941)	Overall percentage
For which Medicare FFS PCF beneficiaries are you currently providing cost sharing support? [check all that apply]		
a. Beneficiaries experiencing financial hardship		
Yes	126	4%
No	46	2%
Skipped item	2,768	94%
Missing	1	0%
b. Beneficiaries with high disease burden		
Yes	89	3%
No	83	3%
Skipped item	2768	94%
Missing	1	0%
c. Beneficiaries with a recent hospitalization or ED visit		
Yes	38	1%
No	134	5%
Skipped item	2,768	94%
Missing	1	0%
d. Other		
Yes	6	0%
No	166	6%
Skipped item	2,768	94%
Missing	1	0%
As part of your PCF participation, is your practice currently providing in-kind items or services for any Medicare FFS PCF beneficiaries attributed to the practice?		
Yes	292	10%
No	2,109	72%
Not sure	367	12%
Missing	173	6%
Is your practice currently using this waiver to allow nurse practitioners to certify the need for diabetic shoes?		
Yes	160	5%
No	1,794	61%
Not sure	524	18%
Missing	463	16%
Which of the following does your practice site typically do when introducing new medically-complex patients to your practice? (Select all that apply)		
a. Conduct a complete health assessment using a health assessment instrument		
Yes	2,283	78%
No	657	22%
Missing	1	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,941)	Overall percentage
b. Conduct a palliative care assessment using a palliative care assessment instrument		
Yes	355	12%
No	2,585	88%
Missing	1	0%
c. Conduct a social needs assessment		
Yes	2,144	73%
No	796	27%
Missing	1	0%
d. Conduct a visit in the home		
Yes	163	6%
No	2,777	94%
Missing	1	0%
e. Conduct a meeting with caregivers		
Yes	649	22%
No	2,291	78%
Missing	1	0%
f. Conduct patient education such as self-management of chronic conditions		
Yes	2,335	79%
No	605	21%
Missing	1	0%
g. Conduct patient education on best approaches to handle urgent care needs and use of the ED		
Yes	2,149	73%
No	791	27%
Missing	1	0%
h. Begin creating care plan		
Yes	1,846	63%
No	1,094	37%
Missing	1	0%
i. Obtain health records from previous primary care provider		
Yes	2,759	94%
No	181	6%
Missing	1	0%
j. Obtain health records from previous or current specialists/mental health providers		
Yes	2,620	89%
No	320	11%
Missing	1	0%
k. Obtain health records from recent acute care stay/ED visit		
Yes	2,606	89%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,941)	Overall percentage
No	334	11%
Missing	1	0%
I. Other		
Yes	66	2%
No	2,874	98%
Missing	1	0%
m. None of the above		
Yes	22	1%
No	2,918	99%
Missing	1	0%
Overall, considering the amount of work required by PCF, how adequate or inadequate are the PCF payments from CMS in supporting changes to better manage the care of patients?		
More than adequate	50	2%
Adequate	766	26%
Less than adequate	1,749	60%
Don't know -not familiar with PCF payments or financial aspects of the practice	375	13%
Missing	1	0%
At your practice site, who leads or champions the implementation of PCF?		
a. Practicing physician (sees patients)		
Yes	1,533	52%
No	1,407	48%
Missing	1	0%
b. Non-practicing physician (does not see patients)		
Yes	178	6%
No	2,762	94%
Missing	1	0%
c. Nurse practitioner (NP)		
Yes	385	13%
No	2,555	87%
Missing	1	0%
d. Clinical nurse specialist (CNS)		
Yes	52	2%
No	2,888	98%
Missing	1	0%
e. Physician assistant (PA)		
Yes	224	8%
No	2,716	92%
Missing	1	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,941)	Overall percentage
f. Practice manager		
Yes	1,979	67%
No	961	33%
Missing	1	0%
g. Another staff member at our practice site		
Yes	471	16%
No	2,469	84%
Missing	1	0%
h. System-level leadership or staff person who is not based at our practice site		
Yes	2,111	72%
No	829	28%
Missing	1	0%
i. Our practice site does not have a PCF lead or champion		
Yes	18	1%
No	2,922	99%
Missing	1	0%
j. Don't know		
Yes	18	1%
No	2,922	99%
Missing	1	0%
Thinking about the practicing physician who leads/champions the implementation of PCF at your practice site, please select the response for each row that most closely describes this practitioner's activities on PCF.		
a. Physician lead/champion at my practice site is knowledgeable about PCF advanced primary care functions		
Never	2	0%
Rarely	8	0%
Sometimes	279	10%
Often	694	24%
Always	451	15%
Skipped item	1,407	48%
Missing	100	3%

Question	Overall count (N = 2,941)	Overall percentage
b. Physician lead/champion at my practice site actively incorporates PCF advanced primary care functions into regular use		
Never	1	0%
Rarely	12	0%
Sometimes	251	8%
Often	762	26%
Always	410	14%
Skipped item	1,407	48%
Missing	98	3%
c. Physician lead/champion at my practice site provides leadership to practice staff in PCF implementation		
Never	10	0%
Rarely	15	0%
Sometimes	287	10%
Often	687	23%
Always	436	15%
Skipped item	1,407	48%
Missing	99	3%
Now, thinking of the different types of staff at your practice site, how often are they involved in implementing PCF?		
a. Other physicians		
Never	188	6%
Rarely	265	9%
Sometimes	1,088	37%
Often	1,009	34%
Always	390	13%
Missing	1	0%
b. Nurse practitioners (NPs), clinical nurse specialists (CNSs), or physician assistants (PAs)		
Never	355	12%
Rarely	269	9%
Sometimes	1,000	34%
Often	933	32%
Always	383	13%
Missing	1	0%

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Question	Overall count (N = 2,941)	Overall percentage
c. Clinical support staff		
Never	101	3%
Rarely	209	7%
Sometimes	924	31%
Often	1,244	42%
Always	462	16%
Missing	1	0%
d. Clerical support staff		
Never	210	7%
Rarely	465	16%
Sometimes	1,131	38%
Often	837	28%
Missing	1	0%
Always	297	10%
e. Practice manager		
Never	31	1%
Rarely	51	2%
Sometimes	467	16%
Often	1,211	41%
Always	1,180	40%
Missing	1	0%
f. System level staff (if applicable)		
Never	143	5%
Rarely	94	3%
Sometimes	395	13%
Often	878	30%
Always	1,430	49%
Missing	1	0%
Thinking about your practice site, please select how much you agree or disagree with each of the following statements.		
a. Practitioners can easily communicate any ideas and/or concerns they may have to practice leadership.		
Strongly Agree	1,700	58%
Agree	1,207	41%
Disagree	7	0%
Strongly Disagree	26	1%
Missing	1	0%

Question	Overall count (N = 2,941)	Overall percentage
b. Practice leadership is responsive to feedback from practitioners.		
Strongly Agree	1,403	48%
Agree	1,501	51%
Disagree	13	0%
Strongly Disagree	23	1%
Missing	1	0%
c. Practitioners have adequate input into decisions that affect how they practice medicine.		
Strongly Agree	1,353	46%
Agree	1,478	50%
Disagree	82	3%
Strongly Disagree	27	1%
Missing	1	0%

Source: Mathematica’s analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2). Total n = 2,945 practices for care delivery items; n = 2,941 for general model items.

CMS = Centers for Medicare & Medicaid Services; CNS = clinical nurse specialist; COPD = chronic obstructive pulmonary disease; DO = doctor of osteopathic medicine; ED = emergency department; EHR = electronic health record; EMR = electronic medical record; FFS = fee for service; IT = information technology; MD = medical doctor; NP = nurse practitioner; PA = physician assistant; PCF = Primary Care First; PY = Performance Year; SIP = seriously ill population.

Exhibit B.7.3. Summary of PCF practices' reported care delivery changes in Performance Year 1

	Overall count (N = 2,941)	Overall percentage
Did practice report making any care delivery changes in this area in their first year of PCF?		
Staffing		
Yes	2,307	78%
No	634	22%
Access		
Yes	2,188	74%
No	753	26%
Care management		
Yes	2,563	87%
No	378	13%
Comprehensiveness and coordination		
Yes	2,733	93%
No	208	7%
Patient and caregiver engagement		
Yes	2,833	96%
No	108	4%
Health IT and data feedback		
Yes	2,235	76%
No	706	24%
Planned care and population health		
Yes	2,189	74%
No	752	26%
Number of areas practices reported making changes in (range: 0-7)		
0	27	1%
1	33	1%
2	122	4%
3	91	3%
4	196	7%
5	325	11%
6	940	32%
7	1,207	41%

Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

IT = information technology, PCF = Primary Care First.

Exhibit B.7.4. Care delivery changes practices reported making during their first year of participation in PCF, by risk group

Reported care delivery change	Percentage of practices that reported change	
	Risk groups 1 and 2 N = 2,875	Risk groups 3 and 4 N = 66
Access and continuity		
Increased patient access to practitioners via non-billable care	55	68
Increased patient access to practitioners via billable care	45	65
Scheduled longer appointments for more complex patients	45	59
Care management		
Improved or expanded care management processes to help patients manage medical conditions between visits	71	79
Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit	70	79
Developed or updated care plans for seriously ill and other complex, chronically ill patients	64	79
Improved or expanded ability to be notified when patients have a hospital discharge or ED visit	59	85
Patient and caregiver engagement and education		
Improved advance care planning	86	86
Educated patients and caregivers about alternatives to the ED	76	89
Initiated or increased contact with patients potentially at risk for hospitalizations or ED visits who have not had a recent contact with our practice	62	76
Implemented or improved a process for patients and caregivers to advise practice improvement (surveys for example, patient surveys of PFACs)	59	79
Comprehensiveness and coordination		
Increased screening for patients' social needs	69	70
Improved coordination with community resources to meet patients' social needs	68	73
Improved coordination with other providers (for example, home health agencies, pharmacists)	58	79
Improved coordination with specialists	54	68
Added behavioral health staff or in some other way enhanced behavioral health integration at our practice site	45	50
Increased access to palliative care	40	71
Reduced use of lower-value tests or other services	33	56
Expanded the types of medical services provided at the practice site to reduce referrals to specialty care	28	35
Improved handoffs to new PCP when patients leave the practice	27	41

Reported care delivery change	Percentage of practices that reported change	
	Risk groups 1 and 2 N = 2,875	Risk groups 3 and 4 N = 66
Planned care and population health		
Increased use of available data to improve care delivery	74	86
Health IT		
Enhanced health information technology capabilities	76	83
Staffing		
Reorganized roles or responsibilities of existing staff	64	76
Added more medical assistants, nurses, or care managers	51	64
Added more practitioners (MD/DO, CNS, NP, or PA)	38	64

Source: Mathematica’s analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Notes: Green-shaded cells indicate meaningful differences of at least 10 percentage points *higher* than the other group. Total N = 2,941 practices.

CNS = clinical nurse specialist; DO = doctor of osteopathic medicine; ED = emergency department; IT = information technology; MD = medical doctor; NP = nurse practitioner; PA = physician assistant; PCF = Primary Care First; PCP = primary care provider; PFAC = Patient and Family Advisory Council; PY = Performance Year.

Exhibit B.7.5. Care delivery changes practices reported making during their first year of participation in PCF, by CPC+ participation status

Reported care delivery change	Percentage of practices that reported change	
	Non-former CPC+ participants N = 1,433	Former CPC+ participants N = 1508
Access and continuity		
Increased patient access to practitioners via non-billable care	57	54
Increased patient access to practitioners via billable care	40	50
Scheduled longer appointments for more complex patients	42	49
Care management		
Improved or expanded care management processes to help patients manage medical conditions between visits	73	69
Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit	75	66
Developed or updated care plans for seriously ill and other complex, chronically ill patients	65	64
Improved or expanded ability to be notified when patients have a hospital discharge or ED visit	64	54
Patient and caregiver engagement and education		
Improved advance care planning	89	84
Educated patients and caregivers about alternatives to the ED	75	78
Initiated or increased contact with patients potentially at risk for hospitalizations or ED visits who have not had a recent contact with our practice	70	55
Implemented or improved a process for patients and caregivers to advise practice improvement (surveys for example, patient surveys of PFACs)	57	62
Comprehensiveness and coordination		
Increased screening for patients' social needs	70	68
Improved coordination with community resources to meet patients' social needs	67	68
Improved coordination with other providers (for example, home health agencies, pharmacists)	58	60
Improved coordination with specialists	55	54
Added behavioral health staff or in some other way enhanced behavioral health integration at our practice site	46	45
Increased access to palliative care	42	38
Reduced use of lower-value tests or other services	34	33
Expanded the types of medical services provided at the practice site to reduce referrals to specialty care	25	30
Improved handoffs to new PCP when patients leave the practice	27	28

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Reported care delivery change	Percentage of practices that reported change	
	Non-former CPC+ participants N = 1,433	Former CPC+ participants N = 1508
Planned care and population health		
Increased use of available data to improve care delivery	80	69
Health IT		
Enhanced health information technology capabilities	81	71
Staffing		
Reorganized roles or responsibilities of existing staff	62	66
Added more medical assistants, nurses, or care managers	56	48
Added more practitioners (MD/DO, CNS, NP, or PA)	36	41

Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Notes: Green-shaded cells indicate meaningful differences of at least 10 percentage points *higher* than the other group. Total N = 2,941 practices.

CNS = clinical nurse specialist; DO = doctor of osteopathic medicine; ED = emergency department; IT = information technology; MD = medical doctor; NP = nurse practitioner; PA = physician assistant; PCF = Primary Care First; PCP = primary care provider; PFAC = Patient and Family Advisory Council; PY = Performance Year.

Exhibit B.7.6. Care delivery changes practices reported making during their first year of participation in PCF, by practice size

Reported care delivery change	Percentage of practices that reported change		
	Small N = 651	Medium N = 1,923	Large N = 367
Access and continuity			
Increased patient access to practitioners via non-billable care	65	52	57
Increased patient access to practitioners via billable care	46	43	54
Scheduled longer appointments for more complex patients	48	44	43
Care management			
Improved or expanded care management processes to help patients manage medical conditions between visits	73	71	72
Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit	72	68	76
Developed or updated care plans for seriously ill and other complex, chronically ill patients	65	65	64
Improved or expanded ability to be notified when patients have a hospital discharge or ED visit	66	58	56
Patient and caregiver engagement and education			
Improved advance care planning	85	87	86
Educated patients and caregivers about alternatives to the ED	83	75	73
Initiated or increased contact with patients potentially at risk for hospitalizations or ED visits who have not had a recent contact with our practice	72	60	60
Implemented or improved a process for patients and caregivers to advise practice improvement (surveys for example, patient surveys of PFACs)	59	60	61
Comprehensiveness and coordination			
Increased screening for patients' social needs	68	68	76
Improved coordination with community resources to meet patients' social needs	63	68	75
Improved coordination with other providers (for example, home health agencies, pharmacists)	61	58	58
Improved coordination with specialists	61	52	54
Added behavioral health staff or in some other way enhanced behavioral health integration at our practice site	41	46	49
Increased access to palliative care	41	38	52
Reduced use of lower-value tests or other services	38	30	42
Expanded the types of medical services provided at the practice site to reduce referrals to specialty care	26	25	43
Improved handoffs to new PCP when patients leave the practice	30	26	27

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Reported care delivery change	Percentage of practices that reported change		
	Small N = 651	Medium N = 1,923	Large N = 367
Planned care and population health			
Increased use of available data to improve care delivery	76	74	76
Health IT			
Enhanced health information technology capabilities	77	75	81
Staffing			
Reorganized roles or responsibilities of existing staff	63	63	70
Added more medical assistants, nurses, or care managers	46	51	64
Added more practitioners (MD/DO, CNS, NP, or PA)	28	37	62

Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Note: Small = one or two practitioners, Medium = three to 10 practitioners, Large = 11 or more practitioners. Practice size is based on the number of active providers as reported in PCF practice roster data. Total N = 2,941 practices.

Green shaded cells indicate meaningful differences of at least 10 percentage points *higher* than the other two groups in the three-way comparison.

CNS = clinical nurse specialist; DO = doctor of osteopathic medicine; ED = emergency department; IT = information technology; MD = medical doctor; NP = nurse practitioner; PA = physician assistant; PCF = Primary Care First; PCP = primary care provider; PFAC = Patient and Family Advisory Council; PY = Performance Year.

Exhibit B.7.7. Care delivery changes practices reported making during their first year of participation in PCF, by practice affiliation

Reported care delivery change	Percentage of practices that reported change		
	Independent (no corporate parent) N = 487	Hospital-based system (vertically integrated) N = 2,066	Part of another type of health care delivery organization N = 375
Access and continuity			
Increased patient access to practitioners via non-billable care	58	56	52
Increased patient access to practitioners via billable care	46	43	54
Scheduled longer appointments for more complex patients	59	41	47
Care management			
Improved or expanded care management processes to help patients manage medical conditions between visits	71	70	78
Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit	72	68	81
Developed or updated care plans for seriously ill and other complex, chronically ill patients	66	64	64
Improved or expanded ability to be notified when patients have a hospital discharge or ED visit	71	54	71
Patient and caregiver engagement and education			
Improved advance care planning	82	89	81
Educated patients and caregivers about alternatives to the ED	83	73	84
Initiated or increased contact with patients potentially at risk for hospitalizations or ED visits who have not had a recent contact with our practice	68	62	56
Implemented or improved a process for patients and caregivers to advise practice improvement (surveys for example, patient surveys of PFACs)	67	56	69
Comprehensiveness and coordination			
Increased screening for patients' social needs	67	70	64
Improved coordination with community resources to meet patients' social needs	61	70	62
Improved coordination with other providers (for example, home health agencies, pharmacists)	60	60	53
Improved coordination with specialists	62	50	65
Added behavioral health staff or in some other way enhanced behavioral health integration at our practice site	33	48	46
Increased access to palliative care	44	38	50
Reduced use of lower-value tests or other services	45	30	37

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Reported care delivery change	Percentage of practices that reported change		
	Independent (no corporate parent) N = 487	Hospital-based system (vertically integrated) N = 2,066	Part of another type of health care delivery organization N = 375
Expanded the types of medical services provided at the practice site to reduce referrals to specialty care	33	25	32
Improved handoffs to new PCP when patients leave the practice	35	26	22
Planned care and population health			
Increased use of available data to improve care delivery	74	74	77
Health IT			
Enhanced health information technology capabilities	71	78	72
Staffing			
Reorganized roles or responsibilities of existing staff	70	61	71
Added more medical assistants, nurses, or care managers	56	48	63
Added more practitioners (MD/DO, CNS, NP, or PA)	37	35	57

Source: Mathematica’s analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Note: Practice affiliation categories are from baseline IQVIA data (2020 data for Cohort 1, 2021 for Cohort 2). There are 13 practices for which data were not available to determine practice affiliation; those practices are excluded from this table. Green-shaded cells indicate meaningful differences of at least 10 percentage points *higher* than the other two groups in the three-way comparison. Blue-shaded cells indicate meaningful differences of at least 10 percentage points *lower* than the other two groups in the three-way comparison. Total N = 2,928 practices.

CNS = clinical nurse specialist; DO = doctor of osteopathic medicine; ED = emergency department; IT = information technology; MD = medical doctor; NP = nurse practitioner; PA = physician assistant; PCF = Primary Care First; PCP = primary care provider; PFAC = Patient and Family Advisory Council; PY = Performance Year.

Exhibit B.7.8. Care delivery changes practices reported making during their first year of participation in PCF, by cohort

Reported care delivery change	Percentage of practices that reported change	
	Cohort 1 N = 785	Cohort 2 N = 2,156
Access and continuity		
Increased patient access to practitioners via non-billable care	56	55
Increased patient access to practitioners via billable care	33	50
Scheduled longer appointments for more complex patients	42	46
Care management		
Improved or expanded care management processes to help patients manage medical conditions between visits	76	70
Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit	71	70
Developed or updated care plans for seriously ill and other complex, chronically ill patients	59	67
Improved or expanded ability to be notified when patients have a hospital discharge or ED visit	65	57
Patient and caregiver engagement and education		
Improved advance care planning	92	85
Educated patients and caregivers about alternatives to the ED	74	77
Initiated or increased contact with patients potentially at risk for hospitalizations or ED visits who have not had a recent contact with our practice	70	60
Implemented or improved a process for patients and caregivers to advise practice improvement (surveys for example, patient surveys of PFACs)	53	62
Comprehensiveness and coordination		
Increased screening for patients' social needs	73	68
Improved coordination with community resources to meet patients' social needs	70	67
Improved coordination with other providers (for example, home health agencies, pharmacists)	53	61
Improved coordination with specialists	53	55
Added behavioral health staff or in some other way enhanced behavioral health integration at our practice site	40	47
Increased access to palliative care	36	42
Reduced use of lower-value tests or other services	29	35
Expanded the types of medical services provided at the practice site to reduce referrals to specialty care	22	30
Improved handoffs to new PCP when patients leave the practice	27	28

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Reported care delivery change	Percentage of practices that reported change	
	Cohort 1 N = 785	Cohort 2 N = 2,156
Planned care and population health		
Increased use of available data to improve care delivery	79	73
Health IT		
Enhanced health information technology capabilities	83	74
Staffing		
Reorganized roles or responsibilities of existing staff	56	67
Added more medical assistants, nurses, or care managers	54	51
Added more practitioners (MD/DO, CNS, NP, or PA)	29	42

Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Notes: Green-shaded cells indicate meaningful differences of at least 10 percentage points *higher* than the other group.

CNS = clinical nurse specialist; DO = doctor of osteopathic medicine; ED = emergency department; IT = information technology; MD = medical doctor; NP = nurse practitioner; PA = physician assistant; PCF = Primary Care First; PCP = primary care provider; PFAC = Patient and Family Advisory Council; PY = Performance Year. Total N = 2,941 practices.

Exhibit B.7.9. Care delivery changes practices reported making during their first year of participation in PCF, by Medicare Shared Savings Program ACO participation status

Reported care delivery change	Percentage of practices that reported change	
	MSSP N = 1,622	Not MSSP N = 1,319
Access and continuity		
Increased patient access to practitioners via non-billable care	59	52
Increased patient access to practitioners via billable care	46	44
Scheduled longer appointments for more complex patients	49	40
Care management		
Improved or expanded care management processes to help patients manage medical conditions between visits	73	69
Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit	72	68
Developed or updated care plans for seriously ill and other complex, chronically ill patients	64	65
Improved or expanded ability to be notified when patients have a hospital discharge or ED visit	58	61
Patient and caregiver engagement and education		
Improved advance care planning	85	89
Educated patients and caregivers about alternatives to the ED	79	73
Initiated or increased contact with patients potentially at risk for hospitalizations or ED visits who have not had a recent contact with our practice	67	57
Implemented or improved a process for patients and caregivers to advise practice improvement (surveys for example, patient surveys of PFACs)	58	62
Comprehensiveness and coordination		
Increased screening for patients' social needs	71	67
Improved coordination with community resources to meet patients' social needs	65	71
Improved coordination with other providers (for example, home health agencies, pharmacists)	63	54
Improved coordination with specialists	57	50
Added behavioral health staff or in some other way enhanced behavioral health integration at our practice site	44	47
Increased access to palliative care	46	34
Reduced use of lower-value tests or other services	37	29
Expanded the types of medical services provided at the practice site to reduce referrals to specialty care	28	27
Improved handoffs to new PCP when patients leave the practice	28	26

Appendix B.7. Frequencies for PCF Practice Portal items: Performance Year 1

Reported care delivery change	Percentage of practices that reported change	
	MSSP N = 1,622	Not MSSP N = 1,319
Planned care and population health		
Increased use of available data to improve care delivery	80	68
Health IT		
Enhanced health information technology capabilities	81	69
Staffing		
Reorganized roles or responsibilities of existing staff	64	64
Added more medical assistants, nurses, or care managers	52	51
Added more practitioners (MD/DO, CNS, NP, or PA)	41	35

Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Notes: Practice Medicare Shared Savings Program ACO status is defined as whether the practice participated in a Medicare Shared Savings Program ACO in any quarter during PCF PY 1 (2021 for Cohort 1, 2022 for Cohort 2), as reported in PCF practice roster data. Green-shaded cells indicate meaningful differences of at least 10 percentage points *higher* than the other group. Total n = 2,941 practices.

CNS = clinical nurse specialist; DO = doctor of osteopathic medicine; ED = emergency department; IT = information technology; MD = medical doctor; MSSP = Medicare Shared Savings ACO Program; NP = nurse practitioner; PA = physician assistant; PCF = Primary Care First; PCP = primary care provider; PFAC = Patient and Family Advisory Council; PY = Performance Year.

Exhibit B.7.10. Care delivery changes practices reported making during their first year of participation in PCF, by practice's SVI quartile

Reported care delivery change	Percentage of practices that reported change	
	SVI quartile 1 & 2 N = 2,270	SVI quartile 3 & 4 N = 637
Access and continuity		
Increased patient access to practitioners via non-billable care	54	62
Increased patient access to practitioners via billable care	46	43
Scheduled longer appointments for more complex patients	45	45
Care management		
Improved or expanded care management processes to help patients manage medical conditions between visits	70	75
Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit	70	71
Developed or updated care plans for seriously ill and other complex, chronically ill patients	65	64
Improved or expanded ability to be notified when patients have a hospital discharge or ED visit	58	65
Patient and caregiver engagement and education		
Improved advance care planning	88	83
Educated patients and caregivers about alternatives to the ED	76	78
Initiated or increased contact with patients potentially at risk for hospitalizations or ED visits who have not had a recent contact with our practice	62	65
Implemented or improved a process for patients and caregivers to advise practice improvement (surveys for example, patient surveys of PFACs)	59	62
Comprehensiveness and coordination		
Increased screening for patients' social needs	68	71
Improved coordination with community resources to meet patients' social needs	68	68
Improved coordination with other providers (for example, home health agencies, pharmacists)	59	59
Improved coordination with specialists	54	54
Added behavioral health staff or in some other way enhanced behavioral health integration at our practice site	47	39
Increased access to palliative care	40	40
Reduced use of lower-value tests or other services	32	37
Expanded the types of medical services provided at the practice site to reduce referrals to specialty care	29	23
Improved handoffs to new PCP when patients leave the practice	27	29

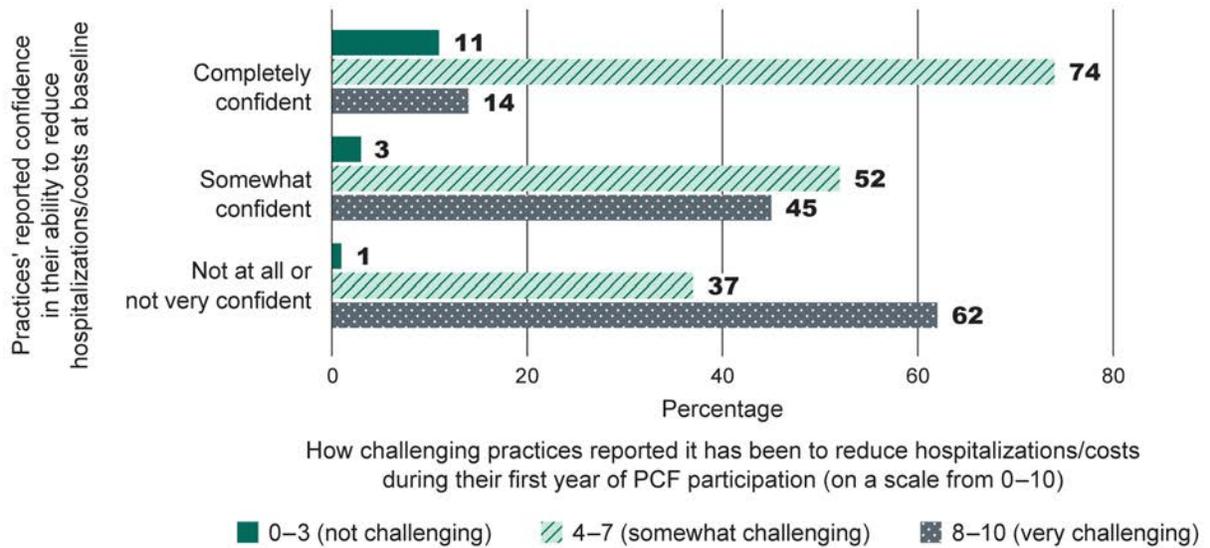
Reported care delivery change	Percentage of practices that reported change	
	SVI quartile 1 & 2 N = 2,270	SVI quartile 3 & 4 N = 637
Planned care and population health		
Increased use of available data to improve care delivery	74	76
Health IT		
Enhanced health information technology capabilities	77	74
Staffing		
Reorganized roles or responsibilities of existing staff	64	63
Added more medical assistants, nurses, or care managers	52	52
Added more practitioners (MD/DO, CNS, NP, or PA)	40	33

Source: Mathematica’s analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2)..

Notes: Practice SVI quartile is the mean of tract-level SVI based on the residence of assigned beneficiaries for the practice. Practice SVI is calculated from publicly available Virtual Research Data Center data from 2020. There are 34 practices for which data were not available to calculate SVI; those practices are excluded from this table. Total n = 2,907 practices

CNS = clinical nurse specialist; DO = doctor of osteopathic medicine; ED = emergency department; IT = information technology; MD = medical doctor; NP = nurse practitioner; PA = physician assistant; PCF = Primary Care First; PCP = primary care provider; PFAC = Patient and Family Advisory Council; PY = Performance Year; SVI = Social Vulnerability Index.

Exhibit B.7.11. Comparison of practices' reported confidence in their ability to reduce acute hospitalizations and/or total cost of care at baseline with how challenging practices reported it has been to reduce hospitalizations and/or costs during their first year of PCF participation



Source: Mathematica's analysis of baseline and PY 1 PCF Practice Portal data.

Note: Total n = 2,835 (the number of practices that responded to the baseline and PY 1 item).

PCF = Primary Care First. PY = Performance Year.

Appendix B.8. PCF practices' main strategies to try to reduce acute hospitalizations and/or costs during their first year of participation in PCF

Exhibit B.8.1. Practices' main strategies to reduce acute hospitalizations, total cost of care, or both during their first year of participation in PCF

Domain	Main strategies to reduce AHU or total cost of care	Percentage of practices that reported each strategy
Care management	Any mention of care management	76%
	Episodic care management (follow ups after ED or hospitalization)	48%
	Longitudinal care management for high-risk patients	28%
	Risk stratification	10%
	Remote patient monitoring	8%
Patient and caregiver engagement and education	Any mention of patient and caregiver engagement and education	39%
	Informing patients on how and where to seek care	20%
	Proactive/increased outreach to patients	14%
	Advance care planning	8%
Access	Any mention of access	36%
	Telehealth	12%
	Same-day visits	11%
Planned care and population health	Any mention of planned care or population health	24%
	Use of data	17%
	Continuous quality improvement	3%
Comprehensiveness and coordination	Any mention of comprehensiveness and coordination	23%
	Behavioral health	8%
	Health-related social needs	7%
Staffing changes	Any mention of staffing changes (including hiring and retraining)	15%
Preventive care	Any mention of preventive care (including annual wellness visits, general health screenings, and vaccinations)	7%
Other strategies	Any other strategies (for example, including health IT investments, receiving financial help or support from a system or payer, etc.)	8%

Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Notes: These data are from responses to an open-ended question about main strategies that were subsequently coded. Practices could provide multiple strategies in response to the open-ended question; we coded all of them, meaning a single response could be coded for multiple domains or strategies. We coded a randomly selected sample of responses to this question.

Sample sizes: Cohort 1 domain sample size: 616 (169 of the 785 active Cohort 1 practices left this question blank). We then coded a random sample of cases at the sub-domain level: care management n = 84, planned care and population health n = 43, patient and caregiver engagement and education n = 34, access n = 38, comprehensiveness and coordination n = 37. Cohort 2 sample size: Coded a random sample of 312 cases at the domain and sub-domain level. Practices that left this item blank were excluded from the random sampling (412 of the 2,156 active Cohort 2 practices left this question blank).

AHU = acute hospitalization utilization; ED = emergency department; IT = information technology; PCF = Primary Care First; PY = Performance Year.

Appendix B.9. Frequencies for PCF Practice Portal items: Baseline

Exhibit B.9.1. Overall frequencies for PCF Practice Portal items at baseline Care delivery items

Question	Overall count (N = 3,038)	Overall percentage
Does your practice provide 24/7 access to care informed, when necessary, by real-time access to the patient's EHR?		
No, we do not have 24/7 access to care guided by the EHR when needed.	21	1%
Yes, we have 24/7 access to a care team practitioner, guided by EHR.	3,017	99%
Missing	0	0%
What percentage of patients are empaneled to a practitioner or care team?		
None	17	1%
Some	110	4%
Most	1,140	38%
All	1,771	58%
Missing	0	0%
Do you risk stratify your empaneled patients?		
Yes	2,883	95%
No	155	5%
Missing	0	0%
Which of the following best describes your practice's care management approach?		
Proactive, relationship-based (longitudinal) care management for patients identified as high need and/or high risk	147	5%
Short-term, goal-oriented episodic care management for patients who have acute or urgent needs (e.g. transitions of care, new serious diagnosis or injury, medical crisis, major life event or other triggering event)	211	7%
Both strategies listed above	2,664	88%
None of the above	15	0%
Missing	1	0%
How do you use documented, personalized care plans?		
For patients receiving care management only	1,503	50%
For patients identified as at high risk or increased complexity regardless of whether or not they receive care management services	634	21%
For SIP patients only (if a SIP practice).	4	0%
Varies based on practitioner preference	576	19%
Other _____ [Free Text]	167	6%
We don't use documented, personalized care plans	154	5%
Missing	0	0%

Appendix B.9. Frequencies for PCF Practice Portal items: Baseline

Question	Overall count (N = 3,038)	Overall percentage
What type of clinicians and staff at your practice support your high-need and/or high-risk patients (Select all that apply)		
a. Practitioner specializing in high-need patients		
No	1,882	62%
Yes	1,156	38%
Missing	0	0%
b. Care manager		
No	476	16%
Yes	2,562	84%
Missing	0	0%
c. Social worker		
No	1,537	51%
Yes	1,501	49%
Missing	0	0%
d. Behavioral health specialist		
No	1,748	57%
Yes	1,290	42%
Missing	0	0%
e. Pharmacist		
No	1,672	55%
Yes	1,366	45%
Missing	0	0%
f. Community health aid or outreach		
No	2571	85%
Yes	467	15%
Missing	0	0%
g. Health coach or educator		
No	2,529	83%
Yes	509	17%
Missing	0	0%
h. Other _____ [free text]		
No	2,528	83%
Yes	510	17%
Missing	0	0%
i. None of the above		
No	2,958	97%
Yes	80	3%
Missing	0	0%

Appendix B.9. Frequencies for PCF Practice Portal items: Baseline

Question	Overall count (N = 3,038)	Overall percentage
Our practice routinely and proactively follows up with patients discharged from hospital:		
Yes—All patients	2,193	72%
Yes—Selectively, based on patient diagnosis, patient characteristics, and/or patient risk.	813	27%
No—We do not routinely and proactively follow up on patients discharged from hospital.	31	1%
Missing	1	0%
IF either YES --> Our practice follows up with patients discharged within:		
24 hours	143	5%
48 hours	1,755	58%
72 hours	923	30%
One week	131	4%
Two weeks	28	1%
We do not have this data, or unknown timeframe.	26	1%
Missing	1	0%
SKIP	31	1%
Our practice routinely and proactively follows up with patients discharged from emergency department:		
Yes—All patients	1,685	56%
Yes—Selectively, based on patient diagnosis, patient characteristics, and/or patient risk.	1,269	42%
No—We do not routinely and proactively follow up on patients discharged from hospital.	83	3%
Missing	1	0%
IF either YES --> Our practice follows up with patients discharged within:		
24 hours	131	4%
48 hours	694	23%
72 hours	596	20%
One week	1,366	45%
Two weeks	21	1%
We do not have this data, or unknown timeframe.	146	5%
Missing	1	0%
SKIP	83	3%
How does your practice identify patients for advance care planning? (Select all that apply)		
a. We do not systematically identify patients for advance care planning		
No	2,806	92%
Yes	231	8%
Missing	1	0%

Question	Overall count (N = 3,038)	Overall percentage
b. High-risk status (using the practice's risk stratification methodology)		
No	1,895	62%
Yes	1,142	38%
Missing	1	0%
c. Patients with serious illness and/or based on age (e.g., cancer diagnosis, end-stage kidney disease, heart failure, COPD)		
No	1,115	37%
Yes	1,922	63%
Missing	1	0%
d. Clinician or care team referral/identification		
No	1,102	36%
Yes	1,935	64%
Missing	1	0%
e. Other _____ [free text]		
No	2,511	83%
Yes	526	17%
Missing	1	0%
How does your practice engage patients/caregivers in your efforts to redesign or improve your practice? (Select all that apply)		
a. We do not engage patients/caregivers to advise in practice improvement activities.		
No	2,946	97%
Yes	91	3%
Missing	1	0%
b. Patient and Family Advisory Council		
No	1,269	42%
Yes	1,768	58%
Missing	1	0%
c. Focus groups		
No	2,777	91%
Yes	260	9%
Missing	1	0%
d. Patient surveys		
No	442	14%
Yes	2,595	85%
Missing	1	0%
e. Participation on improvement committees or workgroups		
No	2,582	85%
Yes	455	15%
Missing	1	0%

Appendix B.9. Frequencies for PCF Practice Portal items: Baseline

Question	Overall count (N = 3,038)	Overall percentage
f. Other _____ [free text]		
No	2,876	95%
Yes	161	5%
Missing	1	0%
Care team members in our practice meet to plan care for your high-need and/or high-risk patients under care management:		
Never	70	2%
Only as needed or ad hoc	1,263	42%
At least daily	308	10%
At least weekly	768	25%
At least monthly	628	21%
Missing	1	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Exhibit B.10.1. Overall frequencies for PCF Practice Portal items in PY2, Cohort 1 only Care delivery items

Question	Overall count (N = 677)	Overall percentage
Does your practice provide 24/7 access to care informed, when necessary, by real-time access to the patient's EHR?		
No	1	0%
Yes	676	100%
Missing	0	0%
When patients need it, my practice is able to provide... same day or next day appointments.		
Never	1	0%
Rarely	2	0%
Sometimes	83	12%
Often	304	45%
Always	287	42%
Missing	0	0%
When patients need it, my practice is able to provide... office visits on the weekend, evening, or early morning,		
Never	104	15%
Rarely	59	9%
Sometimes	189	28%
Often	140	21%
Always	185	27%
Missing	0	0%
When patients need it, my practice is able to provide... email or portal advice on clinical issues		
Never	6	1%
Rarely	6	1%
Sometimes	53	8%
Often	104	15%
Always	508	75%
Missing	0	0%
How does your practice manage timely callbacks to high-risk patients with complex needs and/or seriously ill patients?		
We have not established protocols or pathways to ensure timely callbacks	6	1%
We are in process of developing protocols or pathways	19	3%
We have basic protocols or pathways	350	52%
We have specific protocols or pathways	302	45%
Missing	0	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
How does your practice use the payment flexibility in this model to provide enhanced access? (Select all that apply)		
We do not provide any enhanced access approaches		
Yes	13	2%
No	664	98%
Missing	0	0%
Visits to hospitals, nursing facilities, or other locations by any staff as part of care management and coordination		
Yes	155	23%
No	522	77%
Missing	0	0%
Practitioner visits in alternate locations, including home-based visits		
Yes	148	22%
No	529	78%
Missing	0	0%
Visits in the home by designated staff for care management activities, home assessments, education, or self-management support		
Yes	67	10%
No	610	90%
Missing	0	0%
Practice group visits for purposes of disease management, self-management, and other support		
Yes	126	19%
No	551	81%
Missing	0	0%
Video-based conferencing for primary care visits (e.g., telehealth or telemedicine)		
Yes	625	92%
No	52	8%
Missing	0	0%
Visit over an electronic exchange (phone or, e-visit, portal, email)		
Yes	581	86%
No	96	14%
Missing	0	0%
Patient outreach by community health worker, health coach, and/or caregiver support staff		
Yes	444	66%
No	233	34%
Missing	0	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Activities that support the family/caregiver		
Yes	203	30%
No	474	70%
Missing	0	0%
Other		
Yes	53	8%
No	624	92%
Missing	0	0%
Which model beneficiary engagement incentives is your practice providing to your Medicare beneficiaries? (Select all that apply)		
None		
Yes	483	71%
No	194	29%
Missing	0	0%
Reduced or waived applicable co-insurance for PCF flat visit fees		
Yes	10	2%
No	667	98%
Missing	0	0%
Transportation (e.g., practice-operated van or vouchers for ride sharing services for face-to-face care)		
Yes	142	21%
No	535	79%
Missing	0	0%
Nutrition (e.g., food vouchers, Meals on Wheels services, Weight Watchers classes)		
Yes	110	16%
No	567	84%
Missing	0	0%
Medical equipment (e.g., blood pressure equipment; remote monitoring devices)		
Yes	141	21%
No	536	79%
Missing	0	0%
To which of the following categories of beneficiaries and/or types of clinical needs is your practice providing these beneficiary engagement incentives? (Select all that apply)		
IF: Reduced or waived applicable co-insurance for PCF flat visit fees		
Medicare beneficiaries with financial needs		
Yes	5	1%
No	5	1%
Missing	667	98%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Medicare beneficiaries with complex health needs		
Yes	1	0%
No	9	1%
Missing	667	98%
Medicare beneficiaries with recent hospitalization(s) or Emergency Department (ED) visits		
Yes	1	0%
No	9	1%
Missing	667	98%
All of the above		
Yes	4	1%
No	6	1%
Missing	667	98%
Other		
No	10	2%
Missing	667	98%
IF: Transportation (e.g., practice-operated van or vouchers for ride sharing services for face-to-face care)		
With financial need		
Yes	55	8%
No	87	13%
Missing	535	79%
With complex health needs		
Yes	55	8%
No	87	13%
Missing	535	79%
With recent hospitalization(s) and/or ED visits		
Yes	43	6%
No	99	15%
Missing	535	79%
All of the above		
Yes	78	12%
No	64	10%
Missing	535	79%
Other		
Yes	8	1%
No	134	20%
Missing	535	79%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
IF: Nutrition (e.g., food vouchers, Meals on Wheels services, Weight Watchers classes)		
With financial need		
Yes	48	7%
No	65	10%
Missing	564	83%
With complex health needs		
Yes	46	7%
No	67	10%
Missing	564	83%
With recent hospitalization(s) and/or ED visits		
Yes	44	6%
No	69	10%
Missing	564	83%
All of the above		
Yes	62	9%
No	51	8%
Missing	564	83%
Other		
Yes	3	0%
No	110	16%
Missing	564	83%
IF: Medical equipment (e.g., blood pressure equipment; remote monitoring devices)		
With financial need		
Yes	55	8%
No	86	13%
Missing	536	79%
With complex health needs		
Yes	88	13%
No	53	8%
Missing	536	79%
With recent hospitalization(s) and/or ED visits		
Yes	50	7%
No	91	13%
Missing	536	79%
All of the above		
Yes	52	8%
No	89	13%
Missing	536	79%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Other		
Yes	2	0%
No	139	20%
Missing	536	79%
What percentage of patients are empaneled to a practitioner or care team?		
None (0%)	4	1%
Some (<50% of all patients)	18	3%
Most (50-95%)	187	28%
All (95-100%)	468	69%
Missing	0	0%
Please provide the current number of active patients the practice is currently seeing.		
0-2,499	260	38%
2,500-4,999	202	30%
5,000-7,499	114	17%
7,500-9,999	37	6%
10,000+	64	10%
On average, what percentage of a patient's face-to-face visits are provided by their empaneled practitioner or care team?		
None (0%)	1	0%
Some (<50% of all patients)	8	1%
Most (50-95%)	393	58%
All (95-100%)	275	41%
Missing	0	0%
Do you risk stratify your empaneled patients?		
Yes	663	98%
No	14	2%
Missing	0	0%
Is risk stratification integrated within your EHR or health information technology (IT) system?		
Yes	577	85%
No	100	15%
Missing	0	0%
Which of the following best describes your practice's risk stratification methodology?		
We use an EHR/IT-based, structured, data-driven algorithm	132	20%
We use clinical intuition and judgment	56	8%
We use both	489	72%
Missing	0	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Which of the following best describes your practice’s care management approach?		
Proactive, relationship-based (longitudinal) care management for patients identified as high need and/or high risk	30	4%
Short-term, goal-oriented episodic care management for patients who have acute or urgent needs	20	3%
Both	625	92%
None	2	0%
Missing	0	0%
How do you use documented, personalized care plans?		
For patients receiving care management only	254	38%
For patients identified as at high risk or increased complexity regardless of whether or not they receive care management services	202	30%
Varies based on practitioner preference	166	24%
Other	27	4%
We don’t use documented, personalized care plans	28	4%
Missing	0	0%
Which of the following elements are included in your care planning process and personalized care plan that you develop with patients?		
Mutually agreed upon and developed with patient and family		
Never	6	1%
Rarely	18	3%
Sometimes	42	6%
Often	231	34%
Always	380	56%
Missing	0	0%
Accessible to all team members providing care for the patient		
Never	4	1%
Rarely	4	1%
Sometimes	8	1%
Often	112	16%
Always	549	81%
Missing	0	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Accessible to the patient in clear, simple language to make it easier for the patient/caregiver to understand and use		
Never	8	1%
Rarely	18	3%
Sometimes	39	6%
Often	177	26%
Always	435	64%
Missing	0	0%
Written care plan in clear, simple language for patient/caregiver to understand and use		
Never	50	7%
Rarely	28	4%
Sometimes	46	7%
Often	140	21%
Always	413	61%
Missing	0	0%
Our personalized care plan contains the following information (Select all that apply)		
Patient's overall health or functional goals		
Yes	580	86%
No	97	14%
Missing	0	0%
Treatment goals specific to the patient's condition(s)		
Yes	598	88%
No	79	12%
Missing	0	0%
Advance directives and preferences for care		
Yes	452	67%
No	225	33%
Missing	0	0%
Key contact information for the practice and, if applicable, referral specialists		
Yes	615	91%
No	62	9%
Missing	0	0%
Key actions the patient will take and important contingencies (if/then) specific for the patient and their conditions		
Yes	509	75%
No	168	25%
Missing	0	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Other		
Yes	63	9%
No	614	91%
Missing	0	0%
What type of clinicians and staff at your practice support your high-need and/or high risk patients (Select all that apply)		
Practitioner specializing in high-need patients		
Yes	306	45%
No	371	55%
Missing	0	0%
Care manager		
Yes	564	83%
No	113	17%
Missing	0	0%
Social worker		
Yes	425	63%
No	252	37%
Missing	0	0%
Behavioral health specialist		
Yes	313	46%
No	364	54%
Missing	0	0%
None of the above		
Yes	12	2%
No	665	98%
Missing	0	0%
Our practice routinely and proactively follows up with patients discharged from hospital:		
Yes—All patients	498	74%
Yes—Selectively, based on patient diagnosis, patient characteristics, and/or patient risk.	179	26%
Missing	0	0%
IF either YES --> Our practice follows up with patients discharged within:		
24 hours	24	4%
48 hours	446	66%
72 hours	140	21%
One week	14	2%
Two weeks	34	5%
Unknown	19	3%
Missing	0	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Our practice routinely and proactively follows up with patients discharged from emergency department:		
Yes—All patients	297	44%
Yes—Selectively, based on patient diagnosis, patient characteristics, and/or patient risk.	356	53%
No—We do not routinely and proactively follow up on patients discharged from emergency department.	24	4%
Missing	0	0%
IF either YES --> Our practice follows up with patients discharged within:		
24 hours	24	4%
48 hours	174	26%
72 hours	114	17%
One week	292	43%
Two weeks	27	4%
Unknown	22	3%
Missing	24	4%
Our strategy for integrating behavioral health services into our practice is best described by the following:		
Behavioral Care Management or Collaborative Care Management	247	36%
Primary Care Behaviorist or co-located professional	120	18%
Blend of the two	187	28%
None, we do not integrate behavioral health into our practice	123	18%
Missing	0	0%
Our practice also uses these approaches for Behavioral Health Care: (Select all that apply)		
High-quality referral and coordination with behavioral health specialty care		
Yes	470	69%
No	207	31%
Missing	0	0%
Assess and track patient-reported outcomes for behavioral health conditions under active management (e.g., depression or anxiety)		
Yes	354	52%
No	323	48%
Missing	0	0%
No enhanced strategies beyond traditional referral		
Yes	129	19%
No	548	81%
Missing	0	0%
Other		
Yes	55	8%
No	622	92%
Missing	0	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Do you routinely screen your patients for health-related social needs?		
We screen a targeted subpopulation of patients for health-related social needs.	266	39%
We universally screen all patients for health-related social needs.	388	57%
We do not screen patients for health-related social needs.	23	3%
Missing	0	0%
Do you maintain an inventory of social services and supports to meet patients' health-related social needs that is integrated with your EHR or health IT system?		
No, we do not maintain an inventory of social service resources.	26	4%
Yes, we have an inventory of social service resources, but it is not integrated with our EHR or health IT system.	391	58%
Yes, we have an inventory of social service resources integrated with our EHR or health IT system.	260	38%
Missing	0	0%
Do you have an established, ongoing relationship with social or community resources to address the following health-related social needs? (Select all that apply)		
Food insecurity		
Yes	547	81%
No	130	19%
Missing	0	0%
Housing instability		
Yes	419	62%
No	258	38%
Missing	0	0%
Utility needs		
Yes	426	63%
No	251	37%
Missing	0	0%
Finance resources strain		
Yes	407	60%
No	270	40%
Missing	0	0%
Transportation		
Yes	543	80%
No	134	20%
Missing	0	0%
Employment		
Yes	276	41%
No	401	59%
Missing	0	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Social isolation		
Yes	350	52%
No	327	48%
Missing	0	0%
Safety		
Yes	469	69%
No	208	31%
Missing	0	0%
Activities of daily living or chores services		
Yes	407	60%
No	270	40%
Missing	0	0%
Other		
Yes	32	5%
No	645	95%
Missing	0	0%
We do not have established, ongoing relationship with social or community resources		
Yes	71	10%
No	606	90%
Missing	0	0%
Which best describes your practice's approach to ensure a coordinated referral management system for your high-need patient population (patients who are high-risk, complex, or seriously ill)? (Select all that apply)		
Our practice has established policies and procedures in place to ensure high-value referrals for specialty care and other care organizations		
Yes	417	62%
No	260	38%
Missing	0	0%
Our practice uses data to determine high-volume and/or high-cost specialty providers		
Yes	162	24%
No	515	76%
Missing	0	0%
Our practice employs collaborative care agreements to facilitate effective coordination between practice and referral site		
Yes	228	34%
No	449	66%
Missing	0	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Our practice employs eConsultations to facilitate effective coordination between practice and referral site		
Yes	264	39%
No	413	61%
Missing	0	0%
Our practice employs other tools to facilitate effective coordination between practice and referral site		
Yes	203	30%
No	474	70%
Missing	0	0%
How does your practice identify patients for advance care planning? (Select all that apply)		
We do not systematically identify patients for advance care planning		
Yes	9	1%
No	668	99%
Missing	0	0%
High-risk status (using the practice's risk stratification methodology)		
Yes	290	43%
No	387	57%
Missing	0	0%
Patients with serious illness and/or based on age (e.g., cancer diagnosis, end-stage kidney disease, heart failure, COPD)		
Yes	459	68%
No	218	32%
Missing	0	0%
Clinician or care team referral/identification		
Yes	508	75%
No	169	25%
Missing	0	0%
Other		
Yes	217	32%
No	460	68%
Missing	0	0%
How does your practice engage patients/caregivers in your efforts to redesign or improve your practice? (Select all that apply)		
We do not engage patients/caregivers to advise in practice improvement activities		
Yes	5	1%
No	672	99%
Missing	0	0%

Appendix B.10. Frequencies for PCF Practice Portal items: Performance Year 2, Cohort 2 only

Question	Overall count (N = 677)	Overall percentage
Patient and Family Advisory Council		
Yes	328	48%
No	349	52%
Missing	0	0%
Focus groups		
Yes	77	11%
No	600	89%
Missing	0	0%
Patient surveys		
Yes	640	94%
No	37	6%
Missing	0	0%
Participation on improvement committees or workgroups		
Yes	154	23%
No	523	77%
Missing	0	0%
Other		
Yes	21	3%
No	656	97%
Missing	0	0%
Practitioners or care teams in our practice receive and review clinical quality, health care utilization, cost, and other outcomes data for their patients:		
Weekly	94	14%
Monthly	443	65%
Quarterly	106	16%
Semiannually	25	4%
Annually	3	0%
Never	6	1%
Missing	0	0%
Care team members in our practice meet to plan care for your high-need and/or high risk patients under care management:		
Never	17	2%
Only as needed or ad hoc	279	41%
At least daily	56	8%
At least weekly	147	22%
At least monthly	178	26%
Missing	0	0%

Appendix B.11. Frequencies on portal responses by practices' main transformation strategy

Exhibit B.11.1. Percentage of practices in risk groups 1 and 2 that reported making changes in each of three care delivery functions as their main strategy for reducing acute hospitalizations during their first year of participation in PCF, by primary care function and in total

Reported care delivery change, by care function	Percentage of practices that reported change			
	Longitudinal care management N = 926	Episodic care management N = 721	Comprehensive -ness and coordination N = 415	All risk group 1 and 2 practices N = 2,875
Access and continuity				
Increased patient access to practitioners via non-billable care	62	59	55	55
Increased patient access to practitioners via billable care	43	32	53	45
Scheduled longer appointments for more complex patients	42	47	38	45
Care management				
Improved or expanded care management processes to help patients manage medical conditions between visits	91	78	72	71
Improved or developed new processes to systematically follow up with patients after hospital discharge or ED visit	85	83	81	70
Developed or updated care plans for seriously ill and other complex chronically ill patients	77	78	60	64
Improved or expanded ability to be notified when patients have a hospital discharge or ED visit	60	58	49	59
Patient and caregiver engagement and education				
Improved advance care planning	91	91	89	86
Educated patients and caregivers about alternatives to the ED	80	74	74	76
Initiated or increased contact with patients potentially at risk for hospitalizations or ED visits who have not had a recent contact with our practice	72	68	74	62

Appendix B.11. Frequencies on portal responses by practices' main transformation strategy

Reported care delivery change, by care function	Percentage of practices that reported change			
	Longitudinal care management N = 926	Episodic care management N = 721	Comprehensive -ness and coordination N = 415	All risk group 1 and 2 practices N = 2,875
Implemented or improved a process for patients and caregivers to advise practice improvement (surveys for example, patient surveys of PFACs)	72	66	69	59
Comprehensiveness and coordination				
Increased screening for patients' social needs	77	78	78	69
Improved coordination with community resources to meet patients' social needs	76	69	81	68
Improved coordination with other providers (for example, home health agencies, pharmacists)	70	70	65	58
Improved coordination with specialists	60	59	61	54
Added behavioral health staff or in some other way enhanced behavioral health integration at our practice site	51	57	46	45
Increased access to palliative care	50	39	51	40
Reduced use of lower-value tests or other services	40	26	34	33
Expanded the types of medical services provided at the practice site to reduce referrals to specialty care	32	24	30	28
Improved handoffs to new PCP when patients leave the practice	23	15	31	27
Planned care and population health				
Increased use of available data to improve care delivery	80	82	80	74
Health IT				
Enhanced health information technology capabilities	85	83	76	76
Staffing				
Reorganized roles or responsibilities of existing staff	75	63	76	64
Added more medical assistants, nurses, or care managers	67	51	71	51
Added more practitioners (MD/DO, CNS, NP, or PA)	40	29	41	38

Appendix B.11. Frequencies on portal responses by practices' main transformation strategy

Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2).

Notes: The counts in the first three columns of this table are based on the sampling frames we developed for the round-two practice interviews. Only practices in risk groups 1 and 2 were eligible to participate in this sampling frame. We included practices with multiple primary care functions in each of the functions they identified as central to their efforts to reduce acute hospital utilization (that is, practices can be eligible for inclusion in multiple groups). We excluded from the interview sampling frame 790 of the 2,898 practices in risk groups 1 and 2 that became inactive before October 2022, participated in round one data collection (either directly as a practice or indirectly as part of a system that participated), or did not complete the General Model portal items.

CNS = clinical nurse specialist; DO = doctor of Osteopathy; ED = emergency department; IT = information technology; MD = medical doctor; NP = nurse practitioner; PA = physician; PCF = Primary Care First; PCP = primary care provider; PFAC = Patient and Family Advisory Council; PY = Performance Year.

Appendix B.12. Physician engagement in PCF leadership and implementation and the effect of PCF on physicians' time



Key takeaways

- About one-quarter of all practices reported not having physicians involved in either leading or implementing care delivery changes under PCF.
- Physician engagement in PCF implementation activities varied by practice type, with physician involvement being higher among practices in risk groups 3 and 4, those that were independent or unaffiliated with a larger health care delivery system, and those that had previously participated in Comprehensive Primary Care Plus.
- Practices characterized as having engaged physicians reported their physicians were actively involved in care transformation activities, regularly reviewed performance measures, attended monthly meetings or huddles during which they discussed quality performance issues or the needs of high-risk patients, and identified opportunities for practice improvement and process changes.
- Factors associated with lower levels of physician engagement included lack of meaningful changes in care delivery workflows, lack of staff capacity to take on new assignments, and lack of direct effects of financial incentives on individual physicians.
- Practices characterized as having engaged physicians were more likely to say that PCF enabled physicians to spend more time in patient care because the practice extended the length of visits for high-need patients or hired additional staff to handle nonclinical aspects of care.

B.12.1. Background

Physician engagement in the PCF Model is an important area of inquiry for two reasons. First, when designing the model, the CMS Innovation Center hypothesized that the model would reduce the administrative burdens experienced by many primary care practitioners (including physicians, nurse practitioners, clinical nurse specialists, and physician assistants) and enable them to devote more time to clinical care by spending more time with existing patients or treating more new patients. Second, the peer-reviewed literature suggests that physicians' engagement with health system transformation is associated with improved care outcomes and cost reductions (Perreira et al. 2018, 2019). In this appendix, we examine the extent to which practitioners (particularly physicians) were engaged in changes implemented under PCF as champions or as participants in implementation and how their engagement contributed to the implementation of care delivery activities. We also examine how PCF affected the way in which practitioners spend their time. Understanding practitioners' awareness of and engagement with practice transformation activities will help inform strategies for designing and implementing similar alternative payment models in the future.

B.12.2. Data sources and methods

We relied on two sources of primary data to describe practitioner engagement with the PCF Model and its effects on practitioner time: (1) PCF portal data and (2) practice interview data. We analyzed PCF portal data for all participating practices as reported at the end of their first year of participation (that is, 2021 portal data for practices in Cohort 1 and 2022 portal data for practices in Cohort 2). Our analysis used the following three portal questions:

1. At your practice site, who leads or champions the implementation of PCF?
10. Thinking about the practicing physician who leads/champions the implementation of PCF at your practice site, please select the response for each row that most closely describes this practitioner's activities on PCF:
 - Physician lead/champion at my practice site is knowledgeable about PCF advanced primary care functions
 - Physician lead/champion at my practice site actively incorporates PCF advanced primary care functions into regular use
 - Physician lead/champion at my practice site provides leadership to practice staff in PCF implementation
11. Now, thinking of the different types of staff at your practice site, how often are they [other physicians] involved in implementing PCF?

The first question usually involves being a member of the practice (that is, not an external agent) and being dedicated to achieving the success of the effort, often demonstrated by bridging intra-organizational boundaries and overcoming inertia and resistance to change (Shea 2012). The third question refers to other physicians' engagement (that is, other than the physician lead) in the implementation of PCF activities. Based on the wording of the portal questions, physician champions or leads are assumed to be involved in the implementation of the care delivery changes. Therefore, a combination of the first and third questions provides an indication of the number of practices with a physician involved in the implementation of care delivery strategies or activities under PCF.

We examined the portal responses, in total, and stratified by the three practice characteristics our evaluation has shown to be associated with variation in implementation: (1) risk group assignment (practices in risk groups 1 and 2 versus those in risk groups 3 and 4); system affiliation (practices that were part of a hospital-based health system or another type of care delivery organization versus those that were either independent or unaffiliated); and (3) CPC+ participation status (those that participated in CPC+ versus those that did not). We provide additional detail on the portal data in Chapter 4 and Appendix A.1.4 and the full set of portal questions in Appendix B.7.

We analyzed qualitative information from telephone interviews with a sample of 49 practices conducted between November 2022 and March 2023, which covers the second year of participation for practices in Cohort 1 and the first year of participation for practices in Cohort 2.⁵³ (We describe our sampling strategy and data collection methodology in Appendix A.1.5.) Our analysis of the interview data focused on a subset of questions about physicians' engagement in the changes implemented under PCF and the

⁵³ PCF Practice Portal data for 2022 for Cohort 2 were not available at the time of conducting this analysis.

perceived effect of changes implemented under PCF on physicians' burden and time in clinical care. To support our analysis of the interview data, we classified practices based on their physicians' awareness of the model, participation in care delivery functions, and understanding of how their performance affected payments. We classified practices that met at least two of these criteria as having engaged physicians. We analyzed the interview data using inductive and deductive analysis techniques to generate themes and codes (Patton 2002). We first applied predetermined codes using deductive analysis techniques to capture interview responses about physicians' engagement and effects of the model on their time, and then we used inductive analysis techniques to identify emerging themes and patterns within those codes.

B.12.3. Findings

In this section, we describe (1) the extent to which physicians championed or led PCF implementation, (2) physicians' experiences with the implementation of PCF activities, and (3) the perceived effects of PCF care delivery changes on physicians' time. (Although we asked about practitioners' experiences more generally, the findings presented in this chapter focus on the experiences of physicians because of the critical role they play in successful primary care practice transformation.) These findings are based on PCF portal data reported by all practices and the interview findings based on the sample of practices.

1. Extent and role of physicians in championing or leading PCF implementation

According to the PCF portal data, physicians championed or provided high-level leadership to PCF at about half of all participating practices. The remaining practices reported that PCF was led by practice managers (27 percent); system-level leadership or a staff member who is not based at their practice site (16 percent); nonpracticing physicians (3 percent); or nonphysician practitioners, including nurse practitioners, clinical nurse specialists, and physician assistants (2 percent).

Practice-level physician leadership varied by cohort, risk group, and whether a practice was affiliated with a hospital-based system or another type of care delivery organization (Exhibit B.12.1). For example, nearly two-thirds of all practices in risk groups 3 and 4 reported having a physician lead or champion for PCF compared with slightly over half of all practices in risk groups 1 and 2. A similar proportion of all practices that were independent or unaffiliated with a health care system reported having a physician lead or champion PCF, compared with less than half of practices that were affiliated with a hospital-based system or another type of health care delivery organization. Although the differences were smaller, practices that participated in CPC+ were also more likely to have physician champions than practices that did not participate in CPC+.

Exhibit B.12.1. Percentage of PCF practices that reported having a physician PCF lead or champion

Practice characteristics	Number of practices in each group	Percentage of practices with a PCF physician champion	Percentage of practices without a PCF physician champion
All practices	2,941	52	48
Cohort 1	785	46	54
Cohort 2	2,156	54	46
Risk groups 1 and 2	2,875	52	48
Risk groups 3 and 4	66	64	36
System affiliated	2,441	49	51
Non-system affiliated	487	69	31
CPC+ participant	1,508	55	45
Non-CPC+ participant	1,433	49	51

Source: Mathematica's analysis of PCF Practice Portal data (round 2 for practices in Cohort 1 and round 1 for practices in for Cohort 2); and OneKey data, 2020 and 2021.

Note: System affiliation is based on IQVIA data and captures practices that are affiliated with a system with a hospital or another type of health care delivery organization. The system affiliation of 13 practices could not be determined in OneKey data.

CPC+ = Comprehensive Primary Care First; PCF = Primary Care First.

Among practices with a physician champion, three-quarters reported that their physician champions were knowledgeable about PCF advanced primary care functions; a similar proportion reported that their physician champions incorporated these functions into regular use and provided implementation leadership to others. Similar to the findings above, among those with a physician champion, practices in Cohort 2, risk groups 3 and 4, those that were independent or unaffiliated, and those that participated in CPC+ were more likely to report all three attributes than their group counterparts (see Exhibit B.12.2). The difference was most notable by risk group. Practices in risk groups 3 and 4 with a physician champion were roughly 15 to 20 percentage points more likely to report that their physician leader was knowledgeable about primary care functions, incorporated these functions into regular use, and provided leadership to practice staff than those in risk groups 1 or 2.

Exhibit B.12.2. Percentage of PCF practices with a physician champion that reported their physician lead was knowledgeable about PCF advanced primary care functions, actively incorporated PCF advanced primary care functions into regular use, and provided leadership to practice staff in PCF implementation

Practice characteristics	Number of practices in each group	Percentage of practices whose physician lead:		
		Was knowledgeable about PCF advanced primary care functions	Actively incorporated PCF advanced primary care functions into regular use	Provided leadership to practice staff in PCF implementation
All practices	1,533	75	76	73
Cohort 1	362	66	67	66
Cohort 2	1,171	77	79	75
Risk groups 1 and 2	1,491	74	76	73
Risk groups 3 and 4	42	90	93	93
System affiliated	1,188	73	75	72
Non-system affiliated	338	82	82	79
CPC+ participant	831	80	83	78
Non-CPC+ participant	702	69	69	68

Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2.); and OneKey data, 2020 and 2021.

Note: Percentages are restricted to practices that reported having a physician champion or lead. System affiliation is based on IQVIA data and captures practices that are affiliated with a system with a hospital or another type of health care delivery organization. The system affiliation of 7 practices with a physician champion could not be determined in OneKey data.

PCF = Primary Care First; PY = Performance Year.

A quarter of all practices with a physician champion reported that their physician leads were never, rarely, or only sometimes knowledgeable about PCF advanced primary care functions, incorporated these functions into regular use, and provided implementation leadership to others. This finding suggests that these practices might have had a different interpretation of what being a champion entails and selected this item because they had physicians who were responsible for managing the PCF contract but were not particularly dedicated to achieving the success of the effort, bridging intra-organizational boundaries, or helping to motivate and address challenges to change. Interview data suggest another possible explanation: although local physicians may be responsible for implementation activities at the practice level, overall direction for PCF came from higher levels of administration within a parent organization.

In this section, we described physicians' role in leading PCF. In the next section, we focus on physicians' engagement in the day-to-day implementation of PCF activities.

2. Physicians' experiences with implementation of PCF activities

According to the PCF portal data, three-quarters of all participating practices reported that they had physicians (either a physician lead or another physician) involved in implementing PCF activities. As Exhibit B.12.3 shows, practices in risk groups 3 and 4, independent and unaffiliated practices, and practices that participated in CPC+ were more likely than their counterparts to report

having a physician lead or having another physician often or always involved in implementing PCF activities.

Exhibit B.12.3. Percentage of practices that reported having a physician involved in implementing PCF

Practice characteristics	Number of practices in each group	Percentage of practices with a physician involved in implementing PCF	Percentage of practices without a physician involved in implementing PCF
All practices	2,941	74	26
Cohort 1	785	72	28
Cohort 2	2,156	75	25
Risk groups 1 and 2	2,875	74	26
Risk groups 3 and 4	66	88	12
System affiliated	2,441	72	28
Non-system affiliated	487	87	13
CPC+ participant	1,508	78	22
Non-CPC+ participant	1,433	70	30

Source: Mathematica's analysis of PY 1 PCF Practice Portal data (2021 for Cohort 1, 2022 for Cohort 2.); and OneKey data, 2020 and 2021.

Note: System affiliation is based on IQVIA data and captures practices that are affiliated with a system with a hospital or another type of health care delivery organization. The system affiliation for 13 practices could not be determined in OneKey data.

CNS = clinical nurse specialist; CPC+ = Comprehensive Primary Care Plus; NP = nurse practitioner; PA = physician assistant; PCF = Primary Care First.

The interview data support our portal findings, with less than half of the practices we interviewed classified as having physicians engaged in the day-to-day implementation of care delivery changes. We classified 21 (43 percent) of the 49 practices we interviewed as having engaged physicians (that is, those that met at least two of the three criteria shown in the first column of Exhibit B.12.4), and 18 (37 percent) as having disengaged physicians. We could not classify the remaining 10 practices (20 percent) because of conflicting responses among practice respondents or limited information for making an assessment.

Practices with engaged physicians told us that their physicians were actively involved in care transformation activities at their practices, regularly reviewed quality measures, attended monthly meetings or huddles during which they discussed quality performance issues or the needs of high-risk patients, and identified opportunities for practice improvement and process changes. For example, physicians at several practices actively participated in quality improvement and population health committees and were involved in developing standardized processes, selecting quality metrics, and implementing approaches for achieving those metrics. Physicians at some practices were involved in care improvement activities such as care management but did not know they were attributable to PCF because those processes had been in place before the practice joined PCF or because the system intentionally implemented them in a seamless way. Factors contributing to a higher level of physician engagement include the value that physicians attributed to care delivery changes, an alignment of those changes with the priorities of their affiliated accountable care organizations, integration of care delivery changes with organizational processes (for example,

routinely discussing high-risk patients during the huddles), and linking performance measures to physician salaries.

In contrast, disengaged physicians were not familiar with the model terminology, were not aware of their or their practice's performance on quality metrics and how that performance affected practice payments, and had limited involvement with primary care functions. For example, care coordinators at a few system-affiliated practices shared that physicians at those practices did not coordinate care with them and made limited referrals.

Exhibit B.12.4. Characteristics of physicians who are engaged versus not engaged in PCF implementation

Areas of engagement	Physicians engaged in PCF implementation (N = 21)	Physicians not engaged in PCF implementation (N = 18)
Model awareness	<ul style="list-style-type: none"> Understand PCF requirements and review performance measures regularly. 	<ul style="list-style-type: none"> Not familiar with the terminology of the model or are aware of the model but do not understand its complexities.
Care delivery	<ul style="list-style-type: none"> Knowledgeable and involved in care delivery activities such as ECM, LCM, or CC even if they do not attribute them to PCF. Directly interact with staff responsible for ECM, LCM, or CC services. Know who their high-risk patients are and when their patients are admitted to the hospital. 	<ul style="list-style-type: none"> Limited or ad hoc participation with care delivery activities such as ECM, LCM, or CC. Aware that services such as ECM, LCM, or CC are available but do not know which of their patients receive them.
Payment	<ul style="list-style-type: none"> Understand how PCF payments relate to them and their practice performance. 	<ul style="list-style-type: none"> Do not know whether or how PCF payments relate to them or their practice performance.

Source: Mathematica's analysis of round 2 interview data, October 2022 to March 2023.

Note: We excluded 10 practices with insufficient information from the interviews from this analysis.

CC = comprehensiveness and coordination; ECM = episodic care management; and LCM = longitudinal care management; PCF = Primary Care First.

Limited physician engagement in PCF implementation was associated with system affiliation, lack of new care delivery changes, lack of staff capacity, and little or no direct financial impact.

First, several practices that were part of a larger health care system told us that, because their parent organizations often participated in multiple alternative payment models and quality improvement programs, system administrators preferred that their practitioners focus on patient care and did not expect them to know the details of various insurers or programs. Second, practitioners at several practices had limited awareness of and engagement in PCF because their practices did not make significant or new changes to care delivery after joining the model, and, if they did, those changes were not always visible to practitioners. Third, practitioners at several practices said they were not engaged in PCF

"...there are so many programs that we're participating in. [Practitioners] just know, essentially, the things that we're focusing on from a clinic level. They don't understand the model [or] how it impacts the payments to our system (...)."
 — System lead

activities because they had limited bandwidth stemming from staffing shortages at the practices or were experiencing burnout in the aftermath of COVID-19. Finally, a couple of practices attributed limited practitioner engagement to the fact that PCF payments, particularly those that are part of a health system, did not go to physicians directly, so their decision to engage in PCF implementation had little or no direct impact on them financially. In the next section, we discuss the perceived effects of PCF participation on physicians' ability to spend time in patient care.

3. Effects of PCF participation on physicians' time

Some practices, particularly those whose physicians were engaged in PCF implementation activities, said PCF increased the amount of time physicians were able to spend treating patients.

About one-third of practices said that the PCF Model affected how practitioners spent their time in two favorable ways. First, about one-quarter of the practices we interviewed shared that hiring new staff—such as care managers, social and community health workers, clinical pharmacists, and behavioral health specialists—freed up physicians' time and enabled them to focus on the medical needs of their patients. For example, a system administrator representing one practice said that their care coordinators now consolidate a previous 25-page medical chart into a 10-line note. Instead of reviewing the lengthy charts, physicians and nonphysician clinicians at this practice now had time to focus on direct patient care, such as medication adherence, discharge or care plans, and patient education. A physician at another practice noted that hiring a social worker meant physicians were no longer required to address patient's social needs and could instead focus the visit on care delivery and medications.

"PCF allowed us to provide additional staffing to help handle tasks such as longitudinal care management and behavioral health and handle them more effectively than a provider ever could....It means that someone else who's more qualified can do some of that work so that I can focus my efforts on things that I'm qualified to do. If I can sum up the whole goal of the program in one sentence, it's working to the top of your license."

— Physician

The second benefit to physicians had to do with the length of certain types of visits. Several practices said, after they joined PCF, that their physicians could spend more time with each patient because practices extended the duration of some types of appointments, such as preventive care visits from 15 minutes to 20 or 30 minutes. Others noted that, after joining PCF, their practices began allowing 30 to 40 minutes for discharge follow-up visits, acute care visits, visits with high-risk patients, or transitional care management appointments. These practices noted that the additional time improved patients' experience and outcomes and allowed practitioners to focus on issues such as advance care planning, reviewing medications or discharge paperwork, and coordinating with medical specialists.

Yet another one-third of interviewed practices said that the PCF Model shortened the amount of time their physicians were able to spend with their patients because of increased administrative burdens associated with documenting quality measures or administering new tools such as questionnaires to identify health risks and social needs. Finally, a few practices reported that PCF did not have a noticeable effect on physicians' time because these practices did not make changes in care delivery after joining PCF. Although a few practices said their practitioners used their time differently (for example, spending more time treating patients with same-day appointments or dedicating time for care coordination and documentation activities), these changes did not have a net effect on time spent in patient care or administrative burden. Notably, practices with engaged physicians were more likely to say that PCF had a favorable effect on physicians' time, and those with less-engaged physicians were more likely to report that PCF had negative or no effects on physician time.

"I would say we're working way harder than we ever have because you're trying to hit those metrics because your salary now depends on it... it's the process of the recording and making everything reportable that's actually stressing out most of the physicians."

— Physician

B.12.4. Conclusions

Based on our review of PCF Practice Portal data and information collected through interviews with a sample of practices, physician leadership of and involvement in PCF implementation activities has been limited. Physician engagement was highest among practices in risk groups 3 and 4, those that were not part of a hospital-based system or another care delivery organization, and those that had previously participated in CPC+.

The findings presented in Chapter 5 help explain the variation in physicians' engagement. First, practices in risk groups 3 and 4 serve patients with more serious and complex health needs than practices in risk groups 1 and 2. Higher acuity patients likely require more physician involvement in care delivery in changes. Second, parent organizations of practices that were affiliated with a health care system often designed the care transformation strategies for practices to implement, used staff employed at the parent organization level (such as care managers) to deliver services across all member practices, and shielded their frontline physicians from the risks and rewards of the payment model. Conversely, independent or unaffiliated practices might not have had the same level of resources and staff support as practices in larger health care systems (particularly those with a hospital), which might have involved more reliance on their internal team of practitioners to implement their changes. Finally, practices that participated in CPC+ have a much longer history of implementing care delivery changes under alternative payment models, so they likely had existing champions, structures, and processes for engaging physicians in transformational changes.

These findings are consistent with findings from the CPC+ evaluation and suggest that successful implementation of care improvements under PCF and similar performance-based capitated payment models in the future might benefit from guidance and supports designed to foster physician leadership and engagement in practice transformation activities.

Appendix B.13. Sensitivity tests conducted to test the robustness of our main findings for Medicare Part A and B expenditures

We calculated two alternative estimates as robustness checks of the main difference-in-differences impact estimates on the outcome of Medicare Part A and B expenditures. Specifically, we assessed the sensitivity of our main results to the influence of outliers and to an alternative level of clustering the standard errors in the regression model. We describe each sensitivity test in Exhibit B.13.1. Overall, the results of the sensitivity tests (Exhibit B.13.2) align with the estimates for total Medicare expenditures we report in Chapter 6.

Exhibit B.13.1. Sensitivity tests and motivation for inclusion

Sensitivity test	Motivation
Accounting for influence of outliers	
Trimmed beneficiaries' Medicare Part A and B expenditures at 98th percentile of the beneficiary distribution	Reduces influence of high-cost cases on estimates of PCF impacts.
Alternative levels of clustering	
Cluster standard errors at the TIN level (based on the TIN assigned at baseline), rather than the practice level	Accounts for uncertainty as to the appropriate level of treatment assignment. Decisions to participate in PCF were often determined by a practice's parent organization, such as the health system, rather than by individual practices. This creates uncertainty as to what should be considered the appropriate level of treatment assignment and, therefore, the appropriate level of clustering (Abadie et al. 2023). CMS administrative data do not contain information about a practice's parent organization, but we can cluster at the level of the assigned TIN, using TIN as a proxy for a parent organization.

CMS = Centers for Medicare & Medicaid Services; FFS = fee for service; PCF = Primary Care First; TIN = taxpayer identification number.

Exhibit B.13.2. Comparison of main results for Medicare Part A and B expenditures with the results from tests for the influence of outliers and alternative levels of clustering

Performance year	Number of practices	PCF group mean	Impact estimate (SE)	Percentage impact	p-value
Main difference-in-differences estimates (from Chapter 6)					
Year 1	PCF = 2,809 Comparison = 6,741	\$1,035	\$17 (\$3)	1.6%	<0.01
Year 2	PCF = 757 Comparison = 2,071	\$1,132	\$16 (\$6)	1.4%	0.01
Trimmed beneficiaries' FFS expenditures at 98th percentile of the beneficiary distribution					
Year 1	PCF = 2,809 Comparison = 6,741	\$950	\$18 (\$2)	1.9%	<0.01
Year 2	PCF = 757 Comparison = 2,071	\$1,042	\$16 (\$5)	1.6%	<0.01
Cluster standard errors at the TIN level					
Year 1	PCF = 2,809 Comparison = 6,741	\$1,035	\$17 (\$3)	1.6%	<0.01
Year 2	PCF = 757 Comparison = 2,071	\$1,132	\$16 (\$6)	1.4%	0.01

Source: Mathematica's analysis of Medicare claims data from January 2019 to December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices, conditional on covariates and practice and time fixed effects. Medicare Part A and B expenditures include population-based payments and performance-based adjustments for PCF practices, MIPS adjustments, advanced APM bonuses, and (for the pre-intervention period only) CPC+ Track 2 capitated payments and comprehensiveness bump.

APM = alternative payment model; CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MIPS = Merit-based Incentive Payment System; PCF = Primary Care First; SE = standard error; TIN = taxpayer identification number.

Appendix B.14. Detailed findings from impact analyses of main outcomes and subgroup analyses not presented in main text

A. Full results for leading indicators

Exhibit B.14.1 shows the full set of impact results for the eight leading indicators that we summarize in chapter 5. Note that we did not produce hybrid frequentist-Bayesian probabilities for the leading indicators.

Exhibit B.14.1. Estimated impacts of PCF on eight leading indicators associated with the PCF practices' main primary care activities

Performance year	Number of practices	PCF group mean	Impact estimate (SE)	Percentage impact	P-value
Telehealth use (per 1,000 beneficiaries per year)					
Year 1	PCF N = 2,809 Comparison N = 6,741	835	-3 (11)	-0.3%	0.82
Year 2	PCF N = 757 Comparison N = 2,071	882	-17 (18)	-1.9%	0.35
Urgent care center visits (per 1,000 beneficiaries per year)					
Year 1	PCF N = 2,809 Comparison N = 6,741	223	-1 (2)	-0.6%	0.57
Year 2	PCF N = 757 Comparison N = 2,071	247	4 (6)	1.7%	0.44
Observation stays (per 1,000 beneficiaries per year)					
Year 1	PCF N = 2,809 Comparison N = 6,741	87	<1 (<1)	0.6%	0.41
Year 2	PCF N = 757 Comparison N = 2,071	88	<-1 ^b (1)	-0.4%	0.80
Proportion of elderly beneficiaries experiencing high-risk medication use					
Year 1	PCF N = 2,809 Comparison N = 6,736	0.13	<-0.001 ^c (<0.001)	-0.6%	0.09
Year 2	PCF N = 757 Comparison N = 2,068	0.13	-0.002 (0.001)	-1.8%	0.03
Proportion of eligible beneficiaries who adhere to medications prescribed for multiple chronic conditions					
Year 1	PCF N = 2,802 Comparison N = 6,715	0.69	0.003 (0.001)	0.4%	0.04
Year 2	PCF N = 757 Comparison N = 2,062	0.69	0.003 (0.003)	0.5%	0.18

Performance year	Number of practices	PCF group mean	Impact estimate (SE)	Percentage impact	P-value
Proportion of inpatient discharges, ED visits, or observation stays with follow-up billable service within seven days^a					
Year 1	PCF N = 2,805 Comparison N = 6,731	0.51	-0.003 (0.001)	-0.5%	0.05
Year 2	PCF N = 757 Comparison N = 2,068	0.50	-0.001 (0.003)	-0.2%	0.64
Proportion of eligible beneficiaries who received a transitional care management-billable service					
Year 1	PCF N = 2,809 Comparison N = 6,741	0.05	<0.001 (<0.001)	0.3%	0.80
Year 2	PCF N = 757 Comparison N = 2,071	0.05	0.002 (0.002)	3.1%	0.33
Behavioral health specialist visits in ambulatory settings (per 1,000 beneficiaries per year)					
Year 1	PCF N = 2,809 Comparison N = 6,741	590	-1 (5)	-0.2%	0.81
Year 2	PCF N = 757 Comparison N = 2,071	625	17 (12)	2.7%	0.15

Source: Mathematica’s analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices, conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices’ experience in 2022 only.

^a Our analytic sample for this measure was constructed from discharge-level observations. The regression models for this outcome included additional control variables (each interacted with relative year—that is, year relative to the PCF start date of January 1, 2021, for Cohort 1 or January 1, 2022, for Cohort 2). These additional control variables include (i) proportion of discharges from inpatient settings and (ii) the proportion of discharges from the emergency department.

^b The impact estimate is between 0 and -1.

^c The impact estimate is between 0 and -0.001.

ED = emergency department; FFS = fee for service; PCF = Primary Care First; SE = standard error.

B. Full results by practice subgroup

Exhibits B.14.2–B.14.6 show frequentist impact estimates and hybrid Bayesian probabilities by subgroup category (CPC+ participants, practices affiliated with health systems, and Medicare Shared Savings Program participants) for each primary and secondary outcome. We summarize these results in Chapter 6. For each outcome, we show subgroup estimates by CPC+ participation only for Performance Year 1 because CPC+ participants were not allowed to join PCF until 2022 (giving us only one performance year of data for them).

Exhibit B.14.2. Impacts on acute hospitalizations (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup

Performance year	Subgroup categories	Number (percentage) of PCF practices in subgroup	PCF group mean	Impact estimate (SE)	Percentage impact	P-value	P-value for difference in impact estimates between subgroup categories	Probability the outcome decreased for PCF practices, relative to comparisons, by at least 1% ^a	Probability the impact estimates differ between subgroup categories by at least 1 percent ^b
Whether practice participated in CPC+									
Year 1	Yes	1,188 (42%)	231	<-1 (2) ^c	-0.3%	0.73	0.53	23%	32%
	No	1,621 (58%)	244	<1 (1)	0.3%	0.59		1%	
Whether practice is system affiliated at model launch									
Year 1	Yes	1,943 (69%)	238	<1 (1)	0.2%	0.72	0.50	2%	5%
	No	866 (31%)	236	<-1 (2) ^c	-0.4%	0.57		12%	
Year 2	Yes	540 (71%)	250	3 (2)	1.3%	0.16	0.21	<1%	38%
	No	217 (29%)	264	-2 (3)	-0.7%	0.58		7%	
Whether practice participated in MSSP at model launch									
Year 1	Yes	1,506 (54%)	243	<-1 (1) ^c	-0.2%	0.73	0.50	5%	5%
	No	1,303 (46%)	232	<1 (2)	0.3%	0.63		4%	
Year 2	Yes	439 (58%)	255	2 (3)	0.9%	0.37	0.74	<1%	12%
	No	318 (42%)	251	1 (3)	0.4%	0.69		1%	

Source: Mathematica’s analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants) conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices’ experience in 2022 only.

^a This column reports the probability that outcomes for PCF practices in the subgroup decreased relative to outcomes for comparison practices in the subgroup by at least 1 percent of the pre-intervention mean in the PCF group.

^b This column reports the probability the impact estimates differ between subgroup categories by at least 1 percent of the pre-intervention mean in the PCF group.

^c The impact estimate is between 0 and -1.

CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MSSP= Medicare Shared Savings Program; PCF = Primary Care First; SE = standard error.

Exhibit B.14.3. Impacts on Medicare Part A and B expenditures (\$ per beneficiary per month) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup

Performance year	Subgroup categories	Number (percentage) of PCF practices in subgroup	PCF group mean	Impact estimate (SE)	Percentage impact	P-value	P-value for difference in impact estimates between subgroup categories	Probability the outcome decreased for PCF practices, relative to comparisons, by at least 1% ^a	Probability the impact estimates differ between subgroup categories by at least 1 percent ^b
Whether practice participated in CPC+									
Year 1	Yes	1,188 (42%)	\$992	\$11 (\$5)	1.1%	0.02	0.04	<1%	4%
	No	1,621 (58%)	\$1,073	\$23 (\$4)	2.1%	<0.01		<1%	
Whether practice is system affiliated at model launch									
Year 1	Yes	1,943 (69%)	\$1,029	\$17 (\$4)	1.7%	<0.01	0.93	<1%	<1%
	No	866 (31%)	\$1,048	\$18 (\$5)	1.7%	<0.01		<1%	
Year 2	Yes	540 (71%)	\$1,125	\$14 (\$7)	1.3%	0.06	0.57	<1%	10%
	No	217 (29%)	\$1,154	\$21 (\$10)	1.8%	0.04		<1%	
Whether practice participated in MSSP at model launch									
Year 1	Yes	1,506 (54%)	\$1,041	\$14 (\$4)	1.3%	<0.01	0.13	<1%	5%
	No	1,303 (46%)	\$1,029	\$21 (\$4)	2.1%	<0.01		<1%	
Year 2	Yes	439 (58%)	\$1,099	\$14 (\$8)	1.3%	0.07	0.62	<1%	<1%
	No	318 (42%)	\$1,179	\$19 (\$9)	1.6%	0.02		<1%	

Source: Mathematica’s analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants), conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Medicare Part A and B expenditures include population-based payments and performance-based adjustments for PCF practices, MIPS adjustments, advanced APM bonuses, and (for the pre-intervention period only) CPC+ Track 2 capitated payments and comprehensiveness bump. Estimates for Performance Year 2 reflect Cohort 1 practices’ experience in 2022 only.

^a This column reports the probability that outcomes for PCF practices in the subgroup decreased relative to outcomes for comparison practices in the subgroup by at least 1 percent of the pre-intervention mean in the PCF group.

^b This column reports the probability the impact estimates differ between subgroup categories by at least 1 percent of the pre-intervention mean in the PCF group.

APM = alternative payment model; CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MIPS = Merit-Based Incentive Payment System; MSSP= Medicare Shared Savings Program; PBPM = per beneficiary per month; PCF = Primary Care First; SE = standard error.

Exhibit B.14.4. Impacts on primary-care-substitutable ED visits (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup

Performance year	Subgroup categories	Number (percentage) of PCF practices in subgroup	PCF group mean	Impact estimate (SE)	Percentage impact	P-value	P-value for difference in impact estimates between subgroup categories	Probability the outcome decreased for PCF practices, relative to comparisons, by at least 1% ^a	Probability the impact estimates differ between subgroup categories by at least 1 percent ^b
Whether practice participated in CPC+									
Year 1	Yes	1,188 (42%)	122	<-1 (1) ^c	-0.4%	0.72	0.03	1%	43%
	No	1,621 (58%)	135	3 (1)	2.1%	0.01		<1%	
Whether practice is system affiliated at model launch									
Year 1	Yes	1,943 (69%)	135	3 (1)	2.0%	0.01	0.01	<1%	51%
	No	866 (31%)	116	-1 (1)	-1.2%	0.26		3%	
Year 2	Yes	540 (71%)	145	4 (2)	3.0%	0.06	0.45	<1%	51%
	No	217 (29%)	127	2 (2)	1.6%	0.42		3%	
Whether practice participated in MSSP at model launch									
Year 1	Yes	1,506 (54%)	129	<-1 (1) ^c	-0.3%	0.76	<0.01	2%	85%
	No	1,303 (46%)	130	4 (1)	2.9%	<0.01		<1%	
Year 2	Yes	439 (58%)	140	<1 (2)	0.4%	0.79	<0.01	2%	58%
	No	318 (42%)	142	8 (2)	5.5%	<0.01		<1%	

Source: Mathematica’s analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants), conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices’ experience in 2022 only.

^a This column reports the probability that outcomes for PCF practices in the subgroup decreased relative to outcomes for comparison practices in the subgroup by at least 1 percent of the pre-intervention mean in the PCF group.

^b This column reports the probability the impact estimates differ between subgroup categories by at least 1 percent of the pre-intervention mean in the PCF group.

^c The impact estimate is between 0 and -1.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee for service; MSSP= Medicare Shared Savings Program; PCF = Primary Care First; SE = standard error.

Exhibit B.14.5. Impacts on potentially preventable ED visits (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup

Performance year	Subgroup categories	Number (percentage) of PCF practices in subgroup	PCF group mean	Impact estimate (SE)	Percentage impact	P-value	P-value for difference in impact estimates between subgroup categories	Probability the outcome decreased for PCF practices, relative to comparisons, by at least 1% ^a	Probability the impact estimates differ between subgroup categories by at least 1 percent ^b
Whether practice participated in CPC+									
Year 1	Yes	1,188 (42%)	34	<1 (<1)	1.9%	0.29	0.90	2%	16%
	No	1,621 (58%)	37	<1 (<1)	1.5%	0.30		1%	
Whether practice is system affiliated at model launch									
Year 1	Yes	1,943 (69%)	37	<1 (<1)	2.6%	0.08	0.12	1%	39%
	No	866 (31%)	32	<-1 (<1) ^c	-0.7%	0.65		4%	
Year 2	Yes	540 (71%)	40	<1 (1)	2.1%	0.46	0.78	3%	48%
	No	217 (29%)	38	<1 (1)	1.1%	0.74		11%	
Whether practice participated in MSSP at model launch									
Year 1	Yes	1,506 (54%)	35	<1 (<1)	0.6%	0.68	0.18	3%	47%
	No	1,303 (46%)	36	1 (<1)	2.9%	0.06		1%	
Year 2	Yes	439 (58%)	39	<-1 (1) ^c	-1.4%	0.64	0.03	9%	57%
	No	318 (42%)	40	2 (1)	6.2%	0.03		2%	

Source: Mathematica’s analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants), conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices’ experience in 2022 only.

^a This column reports the probability that outcomes for PCF practices in the subgroup decreased relative to outcomes for comparison practices in the subgroup by at least 1 percent of the pre-intervention mean in the PCF group.

^b This column reports the probability the impact estimates differ between subgroup categories by at least 1 percent of the pre-intervention mean in the PCF group.

^c The impact estimate is between 0 and -1.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee for service; MSSP= Medicare Shared Savings Program; PCF = Primary Care First; SE = standard error.

Exhibit B.14.6. Impacts on proportion of inpatient discharges with unplanned 30-day readmission for Medicare FFS beneficiaries over first two performance years, by practice subgroup

Performance year	Subgroup categories	Number (percentage) of PCF practices in subgroup	PCF group mean	Impact estimate (SE)	Percentage impact	P-value	P-value for difference in impact estimates between subgroup categories	Probability the outcome decreased for PCF practices, relative to comparisons, by at least 1% ^a	Probability the impact estimates differ between subgroup categories by at least 1 percent ^b
Whether practice participated in CPC+									
Year 1	Yes	1,186 (42%)	0.14	<0.001 (0.002)	0.2%	0.88	0.69	41%	11%
	No	1,609 (58%)	0.15	<-0.001 (0.002) ^c	-0.5%	0.66		39%	
Whether practice is system affiliated at model launch									
Year 1	Yes	1,934 (69%)	0.15	-0.001 (0.002)	-0.7%	0.53	0.38	47%	26%
	No	861 (31%)	0.14	0.001 (0.002)	0.8%	0.56		30%	
Year 2	Yes	540 (71%)	0.15	-0.001 (0.003)	-0.7%	0.68	0.59	37%	26%
	No	217 (29%)	0.15	-0.004 (0.004)	-2.4%	0.35		36%	
Whether practice participated in MSSP at model launch									
Year 1	Yes	1,500 (54%)	0.15	<-0.001 (0.002) ^c	-0.6%	0.54	0.48	49%	25%
	No	1,295 (46%)	0.14	<0.001 (0.002)	0.3%	0.81		31%	
Year 2	Yes	439 (58%)	0.15	-0.004 (0.003)	-2.9%	0.13	0.11	45%	33%
	No	318 (42%)	0.15	0.002 (0.003)	1.0%	0.60		27%	

Source: Mathematica’s analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants), conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices’ experience in 2022 only. Our analytic sample for proportion of inpatient discharges with an unplanned 30-day readmission was constructed from discharge-level observations. Therefore, the regression models for these outcomes included additional control variables (each interacted with relative year), including (i) proportion of discharges with indicators for 31 conditions identified in inpatient episodes of care during the 12 months before the inpatient admission as well as those present at admission and (ii) the proportion of inpatient charges with a principal diagnosis or procedure associated with the discharge best classified as (1) medicine, (2) surgery, (3) cardiorespiratory or cardiovascular, or (4) neurology.

^a This column reports the probability that outcomes for PCF practices in the subgroup decreased relative to outcomes for comparison practices in the subgroup by at least 1 percent of the pre-intervention mean in the PCF group.

^b This column reports the probability the impact estimates differ between subgroup categories by at least 1 percent of the pre-intervention mean in the PCF group.

^c The impact estimate is between 0 and -0.001.

CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MSSP= Medicare Shared; PCF = Primary Care First Savings Program; SE = standard error.

C. PCF and comparison means

In this section we present PCF and comparison group means for each baseline year and performance year along with the difference-in-differences impact estimates for the primary outcomes (Exhibit B.14.7), secondary outcomes (Exhibit B.14.8), and practice subgroups (Exhibits B.14.9 to B.14.13). For the PCF group, we show the actual, unadjusted PCF means for each baseline and performance year. For the comparison group, we show the actual, unadjusted means for the baseline years and the adjusted mean in each performance year. We obtained the adjusted means for the comparison group by subtracting the regression-adjusted difference between the PCF and matched comparison groups in each year from the unadjusted PCF mean in that same year.

Exhibit B.14.7. Regression-adjusted means and impacts on primary outcomes for Medicare FFS beneficiaries over the first two performance years

Year	PCF mean	Comparison mean	Impact estimate (SE)	Percentage impact	P-value
Acute hospitalizations (per 1,000 beneficiaries per year)					
Baseline Year 1	256	259	n.a.	n.a.	n.a.
Baseline Year 2	243	241	n.a.	n.a.	n.a.
Performance Year 1	237	237	<1 (1)	<0.1%	0.99
Performance Year 2	254	252	2 (2)	0.7%	0.36
Medicare Part A and B expenditures (\$ PBPM)^a					
Baseline Year 1	\$963	\$959	n.a.	n.a.	n.a.
Baseline Year 2	\$1,007	\$1,000	n.a.	n.a.	n.a.
Performance Year 1	\$1,035	\$1,013	\$17 (\$3)	1.6%	<0.01
Performance Year 2	\$1,132	\$1,111	\$16 (\$6)	1.4%	<0.01

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes regression-adjusted means and impact estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices, conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

^a Medicare Part A and B expenditures include population-based payments and performance-based adjustments for PCF practices, MIPS adjustments, advanced APM bonuses, and (for the pre-intervention period only) CPC+ Track 2 capitated payments and comprehensiveness bump.

APM = alternative payment model; CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MIPS = Merit-Based Incentive Payment System; PBPM = per beneficiary per month; PCF = Primary Care First; SE = standard error.

Exhibit B.14.8. Regression-adjusted means and impacts on secondary outcomes for Medicare FFS beneficiaries over the first two performance years

Year	PCF mean	Comparison mean	Impact estimate (SE)	Percentage impact	P-value
Primary-care-substitutable ED visits (per 1,000 beneficiaries per year)					
Baseline Year 1	145	150	n.a.	n.a.	n.a.
Baseline Year 2	127	133	n.a.	n.a.	n.a.
Performance Year 1	129	133	1 (<1)	0.9%	0.19
Performance Year 2	141	142	4 (2)	2.8%	0.04
Potentially preventable ED visits (per 1,000 beneficiaries per year)					
Baseline Year 1	37	39	n.a.	n.a.	n.a.
Baseline Year 2	34	36	n.a.	n.a.	n.a.
Performance Year 1	36	37	<1 (<1)	1.6%	0.18
Performance Year 2	39	40	<1 (<1)	2.1%	0.37
Proportion of inpatient discharges with unplanned 30-day readmission^a					
Baseline Year 1	0.152	0.151	n.a.	n.a.	n.a.
Baseline Year 2	0.150	0.147	n.a.	n.a.	n.a.
Performance Year 1	0.145	0.143	<-0.001 ^b (0.001)	-0.2%	0.78
Performance Year 2	0.149	0.149	-0.002 (0.002)	-1.1%	0.47

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes regression-adjusted means and impacts estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices, conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

^a Our analytic sample for proportion of inpatient discharges with an unplanned 30-day readmission was constructed from discharge-level observations. Therefore, the regression models for these outcomes included additional control variables (each interacted with relative year), including (i) proportion of discharges with indicators for 31 conditions identified in inpatient episodes of care during the 12 months before the inpatient admission as well as those present at admission and (ii) the proportion of inpatient charges with a principal diagnosis or procedure associated with the discharge best classified as (1) medicine, (2) surgery, (3) cardiorespiratory or cardiovascular, or (4) neurology.

^b The impact estimate is between 0 and -0.001.

ED = emergency department; FFS = fee for service; PCF = Primary Care First.

Exhibit B.14.9. Regression-adjusted means and impacts on acute hospitalizations (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup

Performance year	Subgroup categories	PCF mean	Comparison mean	Impact estimate (SE)	Percentage impact	P-value	P-value for difference in impact estimates between subgroup categories
Whether practice participated in CPC+							
Baseline Year 1	Yes	235	240	n.a	n.a	n.a	n.a
	No	270	269	n.a	n.a	n.a	
Baseline Year 2	Yes	237	240	n.a	n.a	n.a	n.a
	No	250	241	n.a	n.a	n.a	
Performance Year 1	Yes	231	236	<-1 (2) ^a	-0.3%	0.73	0.53
	No	244	238	<1 (1)	0.3%	0.59	
Whether practice is system affiliated at model launch							
Baseline Year 1	Yes	258	265	n.a	n.a	n.a	n.a
	No	252	248	n.a	n.a	n.a	
Baseline Year 2	Yes	244	246	n.a	n.a	n.a	n.a
	No	240	232	n.a	n.a	n.a	
Performance Year 1	Yes	238	242	<1 (1)	0.2%	0.72	0.50
	No	236	230	<-1 (2) ^a	-0.4%	0.57	
Performance Year 2	Yes	250	251	3 (2)	1.3%	0.16	0.21
	No	264	259	-2 (3)	-0.7%	0.58	
Whether practice participated in MSSP at model launch							
Baseline Year 1	Yes	262	264	n.a	n.a	n.a	n.a
	No	250	253	n.a	n.a	n.a	
Baseline Year 2	Yes	249	246	n.a	n.a	n.a	n.a
	No	236	235	n.a	n.a	n.a	
Performance Year 1	Yes	243	242	<-1 (1) ^a	-0.2%	0.73	0.50
	No	232	232	<1 (2)	0.3%	0.63	
Performance Year 2	Yes	255	252	2 (3)	0.9%	0.37	0.74
	No	251	251	1 (3)	0.4%	0.69	

Appendix B.14. Detailed findings from impact analyses of main outcomes and subgroup analyses

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes regression-adjusted means and impact estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants), conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

^a The impact estimate is between 0 and -1.

CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MSSP= Medicare Shared Savings Program; n.a. = not applicable; PCF = Primary Care First; SE = standard error.

Exhibit B.14.10. Regression-adjusted means and impacts on total Part A and B Medicare expenditures (\$ per beneficiary per month) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup

Performance year	Subgroup categories	PCF mean	Comparison mean	Impact estimate (SE)	Percentage impact	P-value	P-value for difference in impact estimates between subgroup categories
Whether practice participated in CPC+							
Baseline Year 1	Yes	\$920	\$933	n.a	n.a	n.a	n.a
	No	\$990	\$975	n.a	n.a	n.a	
Baseline Year 2	Yes	\$974	\$988	n.a	n.a	n.a	n.a
	No	\$1,046	\$1,013	n.a	n.a	n.a	
Performance Year 1	Yes	\$992	\$995	\$11 (\$5)	1.1%	0.02	0.04
	No	\$1,073	\$1,026	\$23 (\$4)	2.1%	<0.01	
Whether practice is system affiliated at model launch							
Baseline Year 1	Yes	\$960	\$967	n.a	n.a	n.a	n.a
	No	\$968	\$946	n.a	n.a	n.a	
Baseline Year 2	Yes	\$1,001	\$1,009	n.a	n.a	n.a	n.a
	No	\$1,021	\$988	n.a	n.a	n.a	
Performance Year 1	Yes	\$1,030	\$1,020	\$17 (\$4)	1.7%	<0.01	0.93
	No	\$1,048	\$1,001	\$18 (\$5)	1.7%	<0.01	
Performance Year 2	Yes	\$1,125	\$1,118	\$14 (\$7)	1.3%	0.06	0.57
	No	\$1,154	\$1,103	\$21 (\$10)	1.8%	0.04	
Whether practice participated in MSSP at model launch							
Baseline Year 1	Yes	\$964	\$971	n.a	n.a	n.a	n.a
	No	\$960	\$947	n.a	n.a	n.a	
Baseline Year 2	Yes	\$1,018	\$1,019	n.a	n.a	n.a	n.a
	No	\$996	\$982	n.a	n.a	n.a	
Performance Year 1	Yes	\$1,041	\$1,031	\$14 (\$4)	1.3%	<0.01	0.13
	No	\$1,029	\$993	\$21 (\$4)	2.1%	<0.01	
Performance Year 2	Yes	\$1,099	\$1,088	\$14 (\$8)	1.3%	0.07	0.61
	No	\$1,179	\$1,146	\$19 (\$9)	1.6%	0.02	

Appendix B.14. Detailed findings from impact analyses of main outcomes and subgroup analyses

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes regression-adjusted means and impact estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants), conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Medicare Part A and B expenditures include population-based payments and performance-based adjustments for PCF practices, MIPS adjustments, advanced APM bonuses, and (for the pre-intervention period only) CPC+ Track 2 capitated payments and comprehensiveness bump. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

APM = alternative payment model; CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MIPS = Merit-Based Incentive Payment System; MSSP= Medicare Shared Savings Program; n.a. = not applicable; PBPM = per beneficiary per month; PCF = Primary Care First; SE = standard error.

Exhibit B.14.11. Regression-adjusted means and impacts on primary-care-substitutable ED visits (per 1,000 beneficiaries per year) over the first two performance years, by practice subgroup

Performance year	Subgroup categories	PCF mean	Comparison mean	Impact estimate (SE)	Percentage impact	P-value	P-value for difference in impact estimates between subgroup categories
Whether practice participated in CPC+							
Baseline Year 1	Yes	117	123	n.a	n.a	n.a	n.a
	No	163	167	n.a	n.a	n.a	
Baseline Year 2	Yes	123	132	n.a	n.a	n.a	n.a
	No	133	134	n.a	n.a	n.a	
Performance Year 1	Yes	122	131	<-1 (1) ^a	-0.4%	0.72	0.03
	No	135	134	3 (1)	2.1%	0.01	
Whether practice is system affiliated at model launch							
Baseline Year 1	Yes	153	161	n.a	n.a	n.a	n.a
	No	125	132	n.a	n.a	n.a	
Baseline Year 2	Yes	133	141	n.a	n.a	n.a	n.a
	No	114	120	n.a	n.a	n.a	
Performance Year 1	Yes	135	140	3 (1)	2.0%	0.01	0.01
	No	116	124	-1 (1)	-1.2%	0.26	
Performance Year 2	Yes	145	148	4 (2)	3.0%	0.06	0.45
	No	127	132	2 (2)	1.6%	0.42	
Whether practice participated in MSSP at model launch							
Baseline Year 1	Yes	149	152	n.a	n.a	n.a	n.a
	No	140	149	n.a	n.a	n.a	
Baseline Year 2	Yes	127	133	n.a	n.a	n.a	n.a
	No	128	133	n.a	n.a	n.a	
Performance Year 1	Yes	129	133	<-1 (1) ^a	-0.3%	0.76	<0.01
	No	130	133	4 (1)	2.9%	<0.01	
Performance Year 2	Yes	140	143	<1 (2)	0.4%	0.79	<0.01
	No	142	140	8 (2)	5.5%	<0.01	

Appendix B.14. Detailed findings from impact analyses of main outcomes and subgroup analyses

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes regression-adjusted means and impact estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants), conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

^a The impact estimate is between 0 and -1.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee for service; MSSP= Medicare Shared Savings Program; n.a. = not applicable; PCF = Primary Care First; SE = standard error.

Exhibit B.14.12. Regression-adjusted means and impacts on potentially preventable ED visits (per 1,000 beneficiaries per year) over the first two performance years, by practice subgroup

Performance year	Subgroup categories	PCF mean	Comparison mean	Impact estimate (SE)	Percentage impact	P-value	P-value for difference in impact estimates between subgroup categories
Whether practice participated in CPC+							
Baseline Year 1	Yes	30	32	n.a	n.a	n.a	n.a
	No	42	43	n.a	n.a	n.a	
Baseline Year 2	Yes	33	36	n.a	n.a	n.a	n.a
	No	35	35	n.a	n.a	n.a	
Performance Year 1	Yes	34	36	<1 (<1)	1.9%	0.29	0.90
	No	37	37	<1 (<1)	1.5%	0.30	
Whether practice is system affiliated at model launch							
Baseline Year 1	Yes	39	43	n.a	n.a	n.a	n.a
	No	32	34	n.a	n.a	n.a	
Baseline Year 2	Yes	36	38	n.a	n.a	n.a	n.a
	No	30	32	n.a	n.a	n.a	
Performance Year 1	Yes	37	39	<1 (<1)	2.6%	0.08	0.12
	No	32	34	<-1 (<1) ^a	-0.7%	0.65	
Performance Year 2	Yes	40	41	<1 (1)	2.1%	0.46	0.78
	No	38	39	<1 (1)	1.1%	0.74	
Whether practice participated in MSSP at model launch							
Baseline Year 1	Yes	38	39	n.a	n.a	n.a	n.a
	No	36	40	n.a	n.a	n.a	
Baseline Year 2	Yes	34	35	n.a	n.a	n.a	n.a
	No	35	36	n.a	n.a	n.a	
Performance Year 1	Yes	35	36	<1 (<1)	0.6%	0.68	0.18
	No	36	37	1 (<1)	2.9%	0.06	
Performance Year 2	Yes	39	41	<-1 (1) ^a	-1.4%	0.64	0.03
	No	40	39	2 (1)	6.2%	0.03	

Appendix B.14. Detailed findings from impact analyses of main outcomes and subgroup analyses

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes regression-adjusted means and impact estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants), conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

^a The impact estimate is between 0 and -1.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee for service; MSSP= Medicare Shared Savings Program; n.a. = not applicable; PCF = Primary Care First; SE = standard error.

Exhibit B.14.13. Regression-adjusted means and impacts on proportion of inpatient discharges with unplanned 30-day readmission over the first two performance years, by practice subgroup

Performance year	Subgroup categories	PCF mean	Comparison mean	Impact estimate (SE)	Percentage impact	P-value	P-value for difference in impact estimates between subgroup categories
Whether practice participated in CPC+							
Baseline Year 1	Yes	0.145	0.146	n.a	n.a	n.a	n.a
	No	0.155	0.154	n.a	n.a	n.a	
Baseline Year 2	Yes	0.146	0.145	n.a	n.a	n.a	n.a
	No	0.155	0.150	n.a	n.a	n.a	
Performance Year 1	Yes	0.140	0.140	<0.001 (0.002)	0.2%	0.88	0.69
	No	0.148	0.146	<-0.001 (0.002) ^a	-0.5%	0.66	
Whether practice is system affiliated at model launch							
Baseline Year 1	Yes	0.153	0.154	n.a	n.a	n.a	n.a
	No	0.148	0.146	n.a	n.a	n.a	
Baseline Year 2	Yes	0.151	0.149	n.a	n.a	n.a	n.a
	No	0.147	0.145	n.a	n.a	n.a	
Performance Year 1	Yes	0.146	0.146	-0.001 (0.002)	-0.7%	0.53	0.38
	No	0.143	0.140	0.001 (0.002)	0.8%	0.56	
Performance Year 2	Yes	0.149	0.149	-0.001 (0.003)	-0.7%	0.68	0.59
	No	0.148	0.149	-0.004 (0.004)	-2.4%	0.35	
Whether practice participated in MSSP at model launch							
Baseline Year 1	Yes	0.153	0.152	n.a	n.a	n.a	n.a
	No	0.149	0.150	n.a	n.a	n.a	
Baseline Year 2	Yes	0.154	0.150	n.a	n.a	n.a	n.a
	No	0.146	0.145	n.a	n.a	n.a	
Performance Year 1	Yes	0.147	0.145	<-0.001 (0.002) ^a	-0.6%	0.54	0.48
	No	0.143	0.142	<0.001 (0.002)	0.3%	0.81	
Performance Year 2	Yes	0.147	0.149	-0.004 (0.003)	-2.9%	0.13	0.11
	No	0.151	0.149	0.002 (0.003)	1.0%	0.60	

Appendix B.14. Detailed findings from impact analyses of main outcomes and subgroup analyses

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes regression-adjusted means and impact estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants), conditional on covariates and fixed effects for each practice and each calendar year. Standard errors are clustered at the practice level. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

Our analytic sample for proportion of inpatient discharges with an unplanned 30-day readmission was constructed from discharge-level observations. Therefore, the regression models for these outcomes included additional control variables (each interacted with relative year), including (i) proportion of discharges with indicators for 31 conditions identified in inpatient episodes of care during the 12 months before the inpatient admission as well as those present at admission and (ii) the proportion of inpatient charges with a principal diagnosis or procedure associated with the inpatient discharge best classified as (1) medicine, (2) surgery, (3) cardiorespiratory or cardiovascular, or (4) neurology.

^a The impact estimate is between 0 and -0.001.

CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MSSP= Medicare Shared Savings Program; n.a. = not applicable; PCF = Primary Care First; SE = standard error.

D. Hybrid frequentist-Bayesian impact estimates

The hybrid frequentist-Bayesian analysis puts the frequentist difference-in-differences impact estimates into the context of evidence from previous, similar evaluations while also borrowing information about impacts across subgroups, across cohorts, and over time for the same outcome. For more details on the methodology, see Appendix A.2.7. With this approach, we obtain impact estimates that are more precise and more plausible, especially for small subgroups, and can calculate the probability of certain effects of interest – for example, the probability that PCF reduced acute hospitalizations in Performance Year 1. Here, we present the impact estimates and standard errors obtained from the hybrid frequentist-Bayesian analysis, as additional context for the probability statements shown in Chapter 6.

Overall sample

Exhibits B.14.14 and B.14.15 show the impact estimates and standard errors for the primary and secondary outcomes, respectively, alongside percentage impacts that compare the impact estimate to the outcome mean in the PCF group.

Exhibit B.14.14. Hybrid frequentist-Bayesian impact estimates for primary outcomes over the first two performance years

Performance year	Number of practices	PCF group mean	Impact estimate (SE)	Percentage impact
Acute hospitalizations (per 1,000 beneficiaries per year)				
Year 1	PCF = 2,810 Comparison = 6,741	237	<-1 ^b (<1)	<-1% ^c
Year 2	PCF = 757 Comparison = 2,071	254	2 (2)	<1%
Medicare Part A and B expenditures (\$ PBPM)^a				
Year 1	PCF = 2,810 Comparison = 6,741	\$1,035	\$16 (\$3)	2%
Year 2	PCF = 757 Comparison = 2,071	\$1,132	\$13 (\$5)	1%

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

^a Medicare Part A and B expenditures include population-based payments and performance-based adjustments for PCF practices, MIPS adjustments, advanced APM bonuses, and (for the pre-intervention period only) CPC+ Track 2 capitated payments and comprehensiveness bump.

^b The impact estimate is between 0 and -1.

^c The percentage impact is between 0 and -1 percent.

APM = alternative payment model; CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MIPS = Merit-Based Incentive Payment System; PBPM = per beneficiary per month; PCF = Primary Care First; SE = standard error.

Exhibit B.14.15. Hybrid frequentist-Bayesian impact estimates for secondary outcomes over the first two performance years

Performance year	Number of practices	PCF group mean	Impact estimate (SE)	Percentage impact
Primary-care-substitutable ED visits (per 1,000 beneficiaries per year)				
Year 1	PCF N = 2,810 Comparison N = 6,741	129	2 (<1)	1%
Year 2	PCF N = 757 Comparison N = 2,071	141	3 (2)	2%
Potentially preventable ED visits (per 1,000 beneficiaries per year)				
Year 1	PCF N = 2,810 Comparison N = 6,741	36	<1 (<1)	2%
Year 2	PCF N = 757 Comparison N = 2,071	39	<1 (<1)	2%
Proportion of inpatient discharges with unplanned 30-day readmission ^a				
Year 1	PCF N = 2,806 Comparison N = 6,709	0.14	-0.001 (0.001)	<-1% ^c
Year 2	PCF N = 757 Comparison N = 2,057	0.15	<-0.001 ^b (0.002)	<-1% ^c

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

^a Our analytic sample for proportion of inpatient discharges with an unplanned 30-day readmission was constructed from discharge-level observations. Therefore, the regression models for these outcomes included additional control variables (each interacted with relative year), including (i) proportion of discharges with indicators for 31 conditions identified in inpatient episodes of care during the 12 months before the inpatient admission as well as those present at admission and (ii) the proportion of inpatient charges with a principal diagnosis or procedure associated with the discharge best classified as (1) medicine, (2) surgery, (3) cardiorespiratory or cardiovascular, or (4) neurology.

^b The impact estimate is between 0 and -0.001.

^c The percentage impact is between 0 and -1 percent.

ED = emergency department; FFS = fee for service; PCF = Primary Care First; SE = standard error.

Subgroup results

Exhibits B.14.16 to B.14.21 report impact estimates for the three practice subgroups of interest in this report (CPC+ participants, practices affiliated with health systems, and Medicare Shared Savings Program participants) for each primary and secondary outcome.

Exhibit B.14.16. Impacts on acute hospitalizations (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup

Performance year	Subgroup categories	Number (percentage) of PCF practices in subgroup	PCF group mean	Impact estimate (SE)	Percentage impact
Whether practice participated in CPC+					
Year 1	Yes	1,188 (42%)	231	-1 (1)	<-1% ^b
	No	1,621 (58%)	244	<1 (1)	<1%
Whether practice is system affiliated at model launch					
Year 1	Yes	1,943 (69%)	238	<-1 (1) ^a	<-1% ^b
	No	866 (31%)	236	<-1 (1) ^a	<-1% ^b
Year 2	Yes	540 (71%)	250	3 (2)	1%
	No	217 (29%)	264	<1 (2)	<1%
Whether practice participated in MSSP at model launch					
Year 1	Yes	1,506 (54%)	243	<-1 (1) ^a	<-1% ^b
	No	1,303 (46%)	232	<-1 (1) ^a	<-1% ^b
Year 2	Yes	439 (58%)	255	2 (2)	<1%
	No	318 (42%)	251	2 (2)	<1%

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants). Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

^a The impact estimate is between 0 and -1.

^b The percentage impact is between 0 and -1 percent.

CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MSSP= Medicare Shared Savings Program; PCF = Primary Care First; SE = standard error.

Exhibit B.14.17. Impacts on Medicare Part A and B expenditures (\$ per beneficiary per month) for Medicare FFS beneficiaries over the first two performance years, by practice subgroup

Performance year	Subgroup categories	Number (percentage) of PCF practices in subgroup	PCF group mean	Impact estimate (SE)	Percentage impact
Whether practice participated in CPC+					
Year 1	Yes	1,188 (42%)	\$992	\$14 (\$3)	1%
	No	1,621 (58%)	\$1,073	\$18 (\$3)	2%
Whether practice is system affiliated at model launch					
Year 1	Yes	1,943 (69%)	\$1,029	\$16 (\$3)	2%
	No	866 (31%)	\$1,048	\$16 (\$3)	2%
Year 2	Yes	540 (71%)	\$1,125	\$13 (\$6)	1%
	No	217 (29%)	\$1,154	\$15 (\$7)	1%
Whether practice participated in MSSP at model launch					
Year 1	Yes	1,506 (54%)	\$1,041	\$14 (\$3)	1%
	No	1,303 (46%)	\$1,029	\$18 (\$3)	2%
Year 2	Yes	439 (58%)	\$1,099	\$13 (\$6)	1%
	No	318 (42%)	\$1,179	\$13 (\$6)	1%

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants). Medicare Part A and B expenditures include population-based payments and performance-based adjustments for PCF practices, MIPS adjustments, advanced APM bonuses, and (for the pre-intervention period only) CPC+ Track 2 capitated payments and comprehensiveness bump. Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

APM = alternative payment model; CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; MIPS = Merit-Based Incentive Payment System; MSSP= Medicare Shared Savings Program; PBPM = per beneficiary per month; PCF = Primary Care First; SE = standard error.

Exhibit B.14.18. Impacts on primary-care-substitutable ED visits (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over first two performance years, by practice subgroup

Performance year	Subgroup categories	Number (percentage) of PCF practices in subgroup	PCF group mean	Impact estimate (SE)	Percentage impact
Whether practice participated in CPC+					
Year 1	Yes	1,188 (42%)	122	1 (<1)	<1%
	No	1,621 (58%)	135	2 (<1)	2%
Whether practice is system affiliated at model launch					
Year 1	Yes	1,943 (69%)	135	2 (<1)	2%
	No	866 (31%)	116	<1 (<1)	<1%
Year 2	Yes	540 (71%)	145	4 (2)	3%
	No	217 (29%)	127	2 (2)	2%
Whether practice participated in MSSP at model launch					
Year 1	Yes	1,506 (54%)	129	<1 (<1)	<1%
	No	1,303 (46%)	130	3 (<1)	2%
Year 2	Yes	439 (58%)	140	2 (2)	2%
	No	318 (42%)	142	4 (2)	3%

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants). Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee for service; MSSP= Medicare Shared Savings Program; PCF = Primary Care First; SE = standard error.

Exhibit B.14.19. Impacts on potentially preventable ED visits (per 1,000 beneficiaries per year) for Medicare FFS beneficiaries over first two performance years, by practice subgroup

Performance year	Subgroup categories	Number (percentage) of PCF practices in subgroup	PCF group mean	Impact estimate (SE)	Percentage impact
Whether practice participated in CPC+					
Year 1	Yes	1,188 (42%)	34	<1 (<1)	2%
	No	1,621 (58%)	37	<1 (<1)	2%
Whether practice is system affiliated at model launch					
Year 1	Yes	1,943 (69%)	37	<1 (<1)	2%
	No	866 (31%)	32	<1 (<1)	1%
Year 2	Yes	540 (71%)	40	<1 (<1)	2%
	No	217 (29%)	38	<1 (<1)	1%
Whether practice participated in MSSP at model launch					
Year 1	Yes	1,506 (54%)	35	<1 (<1)	1%
	No	1,303 (46%)	36	<1 (<1)	2%
Year 2	Yes	439 (58%)	39	<1 (<1)	1%
	No	318 (42%)	40	1 (<1)	3%

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants). Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee for service; MSSP= Medicare Shared Savings Program; PCF = Primary Care First; SE = standard error.

Exhibit B.14.20. Impacts on proportion of inpatient discharges with unplanned 30-day readmission for Medicare FFS beneficiaries over first two performance years, by practice subgroup

Performance year	Subgroup categories	Number (percentage) of PCF practices in subgroup	PCF group mean	Impact estimate (SE)	Percentage impact
Whether practice participated in CPC+					
Year 1	Yes	1,186 (42%)	0.14	-0.001 (0.001)	<-1% ^b
	No	1,609 (58%)	0.15	-0.001 (0.001)	<-1% ^b
Whether practice is system affiliated at model launch					
Year 1	Yes	1,934 (69%)	0.15	-0.001 (0.001)	<-1% ^b
	No	861 (31%)	0.14	<-0.001 (0.001) ^a	<-1% ^b
Year 2	Yes	540 (71%)	0.15	<-0.001 (0.002) ^a	<-1% ^b
	No	217 (29%)	0.15	<-0.001 (0.002) ^a	<-1% ^b
Whether practice participated in MSSP at model launch					
Year 1	Yes	1,500 (54%)	0.15	-0.001 (0.001)	<-1% ^b
	No	1,295 (46%)	0.14	<-0.001 (0.001) ^a	<-1% ^b
Year 2	Yes	439 (58%)	0.15	-0.001 (0.002)	<-1% ^b
	No	318 (42%)	0.15	<-0.001 (0.002) ^a	<-1% ^b

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2022.

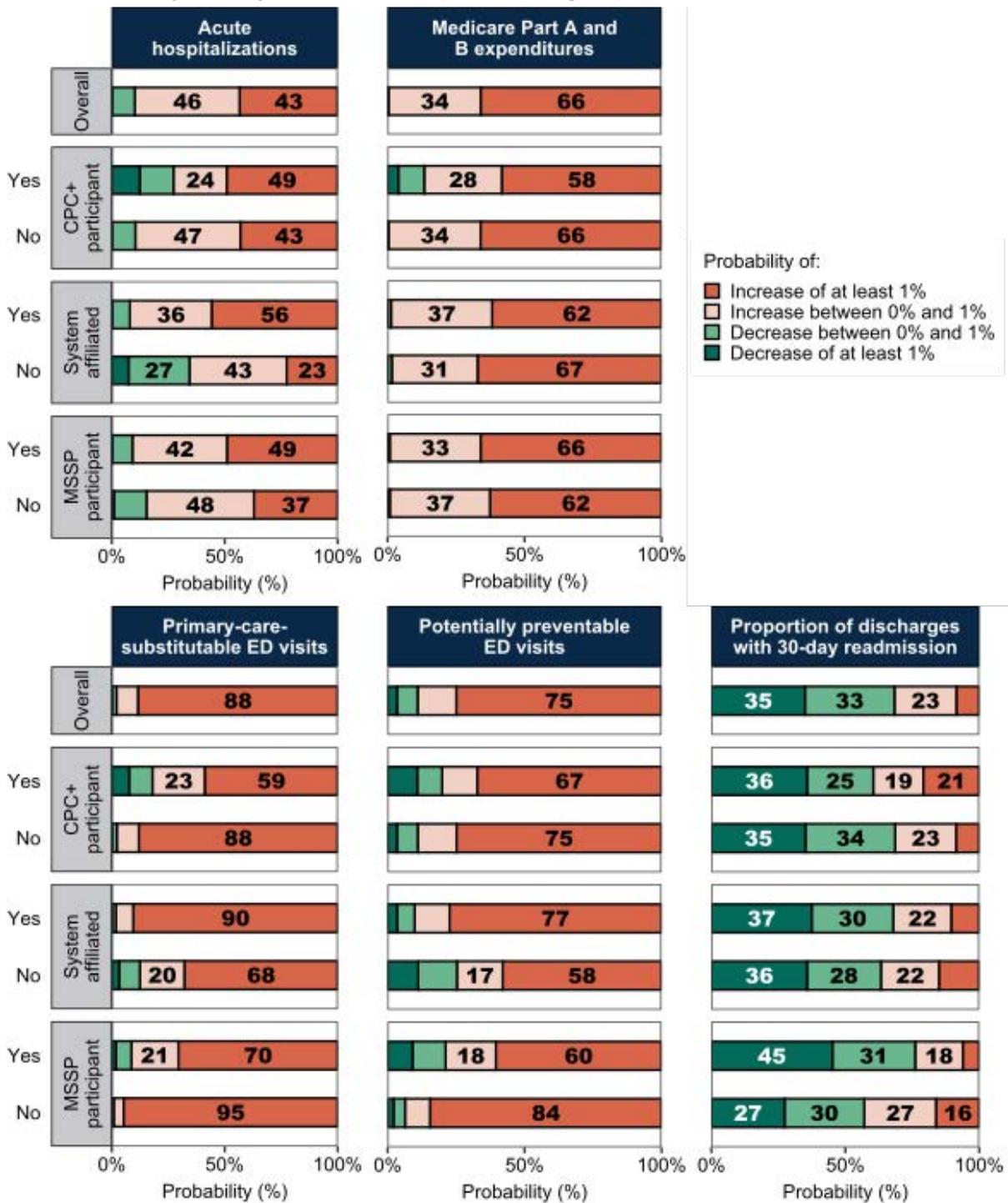
Notes: This table includes estimates from a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries assigned to a PCF practice in a given subgroup during the first two years of PCF compared with the average outcome in the baseline period, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices in the same subgroup (except for the CPC+ analysis, where we use the difference over time for Medicare FFS beneficiaries assigned to comparison practices matched to PCF practices regardless of whether the comparisons are CPC+ participants). Estimates for Performance Year 2 reflect Cohort 1 practices' experience in 2022 only.

^a The impact estimate is between 0 and -0.001.

^b The percentage impact is between 0 and -1 percent.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee for service; MSSP= Medicare Shared Savings Program; PCF = Primary Care First; SE = standard error.

Exhibit B.14.21. Hybrid Bayesian results for practice subgroups in Performance Year 2



Source: Mathematica’s analysis of Medicare claims data from January 2019 through December 2022.

Notes: This exhibit illustrates the probability of impacts at different thresholds for the primary and secondary outcomes overall and by subgroup in Performance Year 2, which reflects Cohort 1 practices’ experience in 2022 only. Within increases and decreases relative to the comparison group, a threshold of 1% is used to show the likelihood of different magnitudes of effects.

ED = emergency department; CPC+ = Comprehensive Primary Care Plus; MSSP = Shared Savings Program.

Mathematica Inc.

Our employee-owners work nationwide and around the world.

Find us at mathematica.org and edi-global.com.



Mathematica, Progress Together, and the "spotlight M" logo are registered trademarks of Mathematica Inc.