

J U N E 2 0 1 4

REPORT TO THE CONGRESS

Medicare and the Health Care Delivery System

MEDpAC Medicare
Payment Advisory
Commission

MEDPAC Medicare Payment Advisory Commission

The Medicare Payment Advisory Commission (MedPAC) is an independent congressional agency established by the Balanced Budget Act of 1997 (P.L. 105–33) to advise the U.S. Congress on issues affecting the Medicare program. In addition to advising the Congress on payments to health plans participating in the Medicare Advantage program and providers in Medicare’s traditional fee-for-service program, MedPAC is also tasked with analyzing access to care, quality of care, and other issues affecting Medicare.

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June 13, 2014

The Honorable Joseph R. Biden
President of the Senate
U.S. Capitol
Washington, DC 20510

The Honorable John A. Boehner
Speaker of the House
U.S. House of Representatives
U.S. Capitol
Room H-232
Washington, DC 20515

Dear Mr. President and Mr. Speaker:

I am pleased to submit the Medicare Payment Advisory Commission's June 2014 *Report to the Congress: Medicare and the Health Care Delivery System*. This report fulfills the Commission's legislative mandate to evaluate Medicare payment issues and to make recommendations to the Congress.

In the seven chapters of this report, we consider:

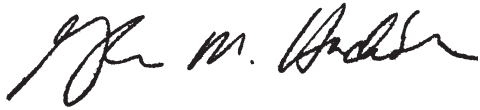
- synchronizing Medicare policy across payment models;
- improving risk adjustment in the Medicare program;
- reevaluating current approaches to measuring the quality of care in Medicare, with a discussion of an alternative approach;
- aligning financial assistance policies for low-income beneficiaries;
- paying for primary care using a per beneficiary payment;
- addressing Medicare payment differences across post-acute settings; and
- measuring the effects of medication adherence on medical spending for the Medicare population.

In an online appendix, as required by law, we review CMS's preliminary estimate of the update to payments under the physician fee schedule for 2015.

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I hope you find this report useful as the Congress continues to grapple with the difficult task of controlling the growth of Medicare spending while preserving beneficiaries' access to high-quality care and providing sufficient payment for efficient providers.

Sincerely,

A handwritten signature in black ink, appearing to read "Glenn M. Hackbarth". The signature is fluid and cursive, with the first name being the most prominent.

Glenn M. Hackbarth, J.D.

Enclosure

Acknowledgments

This report was prepared with the assistance of many people. Their support was key as the Commission considered policy issues and worked toward consensus.

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Executive summary

Executive summary

As part of its mandate from the Congress, each June the Commission reports on refinements to Medicare payment systems and on issues affecting the Medicare program, including broader changes in health care delivery and the market for health care services. In the seven chapters of this report we consider:

- ***Synchronizing Medicare policy across payment models***—In 2012, a third payment model, the accountable care organization (ACO), became available in addition to the traditional fee-for-service (FFS) and Medicare Advantage (MA) payment models. A major issue is that Medicare’s payment rules and incentives are different and inconsistent across the three payment models. To address that issue and start to synchronize Medicare policy across payment models, we examine setting a common spending benchmark—tied to local FFS spending—for MA plans and ACOs.
- ***Improving risk adjustment in the Medicare program***—Risk adjustment is currently used to ensure that Medicare’s payments track the expected costs of beneficiaries. We examine three models for improving how well risk adjustment predicts cost for the highest cost and lowest cost beneficiaries and suggest that, given the limitations of those models, administrative measures may be needed to better calibrate payments to expected costs.
- ***Measuring quality of care in Medicare***—Current quality measures are overly process oriented, too numerous, may not track well to health outcomes, and are a burden on providers; they may not be appropriate for each of the payment models discussed in Chapter 1. We examine which approaches to quality measures would be appropriate to each payment model and consider using population-based outcome measures (e.g., potentially avoidable admissions for the FFS population in an area) to evaluate and compare quality within a local area across Medicare’s three payment models. Provider-specific quality measures may still be needed for FFS payment adjustments.
- ***Financial assistance for low-income beneficiaries***—We discuss how changing income eligibility for the Medicare Savings Programs could help low-income Medicare beneficiaries afford out-

of-pocket (OOP) costs under a redesigned Medicare FFS benefit package.

- ***Paying for primary care using a per beneficiary payment***—The current FFS-based primary care bonus program expires in 2015. We consider an option to continue additional payments to primary care practitioners, but in the form of a per beneficiary payment. The current FFS approach encourages volume. A per beneficiary approach could help encourage care coordination.
- ***Medicare payment differences across post-acute settings***—Medicare’s payment rates often vary for treating similar patients in different settings, such as inpatient rehabilitation facilities (IRFs) and skilled nursing facilities (SNFs). We examine three conditions and assess the feasibility of paying IRFs the same rates as SNFs for those conditions.
- ***Measuring the effects of medication adherence on medical spending for the Medicare population***—We examine the effects of medication adherence for patients with congestive heart failure (CHF) and find that greater medication adherence is associated with lower medical costs, but that effect is dependent on the beneficiaries’ previous health status, decays over time, and is sensitive to the specifications of the model.

In an online appendix (available at <http://www.medpac.gov>), as required by law, we review CMS’s preliminary estimate of the update to payments under the physician fee schedule for 2015.

Synchronizing Medicare policy across payment models

Historically, Medicare has had two payment models: traditional FFS and MA. Traditional FFS pays for individual services, according to the payment rates established by the program. By contrast, under MA, Medicare pays private plans capitated payment rates to provide the Part A and Part B benefit package except hospice. Starting in 2012, Medicare introduced a new payment model: the ACO. Under the ACO model, a group of providers is accountable for the spending and quality of care of a group of beneficiaries attributed to them. The goal of the ACO program is to give groups of FFS providers incentives to reduce Medicare spending and improve quality, similar to the incentives given to private plans under the MA program.

A major issue is that Medicare’s payment rules and quality improvement incentives are different and inconsistent across the three payment models. There are various approaches to making those rules more consistent. From the program perspective, the Commission is examining synchronizing policy across payment models with respect to spending benchmarks, quality measurement, and risk adjustment and will be examining synchronizing regulatory oversight. The Commission is also interested in the beneficiary perspective on synchronizing policy across payment models, including how beneficiaries learn about the Medicare program, choose plans, and respond to financial incentives.

Chapter 1 represents the Commission’s initial exploration of synchronizing Medicare policy across payment models and is not intended to be a definitive or comprehensive discussion. In this initial analysis, we focus on setting a common spending benchmark—based on local FFS spending—for MA plans and ACOs as a key element of synchronizing Medicare policy across payment models. Using an analysis of early results from the Pioneer ACOs, we illustrate that no single payment model is uniformly less costly than another model in all markets across the country. Which model is less costly and which ACOs and MA plans may want to enter the program would be sensitive to how benchmarks are set.

Improving risk adjustment in the Medicare program

Health plans that participate in the MA program receive monthly capitated payments for each Medicare enrollee. Each capitated payment has two parts: a base rate, which reflects the payment if an MA enrollee has the health status of the national average beneficiary, and a risk score, which indicates how costly the enrollee is expected to be relative to the national average beneficiary. The purpose of the risk scores is to adjust MA payments so that they accurately reflect how much each MA enrollee is expected to cost.

Currently, Medicare uses the CMS–hierarchical condition category (CMS–HCC) model to risk adjust MA payments. This model uses beneficiaries’ demographic characteristics and medical conditions collected into hierarchical condition categories to predict their costliness. But, although it is an improvement over past models, the CMS–HCC model predicts costs that are higher than actual costs (overpredicts) for beneficiaries who have very low costs and lower than actual costs (underpredicts)

for beneficiaries who have very high costs. These prediction errors can result in Medicare paying too much for low-cost beneficiaries and not enough for high-cost beneficiaries. These underpayments and overpayments raise an issue of equity among MA plans. Plans that have a disproportionately high share of high-cost enrollees may be at a competitive disadvantage relative to those whose enrollees have low costs.

A related issue is how risk-adjustment inaccuracies affect equity among MA plans, FFS Medicare, and ACOs. If payment equity among these three payment models is a goal, risk adjustment that results in more accurate payments for high-cost and low-cost beneficiaries is vital. For example, if the MA sector can attract low-cost beneficiaries (for which Medicare overpays) and avoid high-cost beneficiaries (for which Medicare underpays), the risk-adjusted payments in the MA sector would exceed what their enrollees would cost in ACOs or FFS Medicare.

In Chapter 2, we investigate alternative methods discussed in the literature for improving how well risk adjustment predicts costs for the highest cost and lowest cost beneficiaries. We examine three models and find that all three would introduce some degree of cost-based payment into the MA program, which could reduce incentives for plans to manage their enrollees’ conditions to hold down costs. The Commission concludes that because of the limitations of these models, administrative measures may be needed to better calibrate payments to expected costs.

Measuring quality of care in Medicare

The Commission is considering alternatives to Medicare’s current system for measuring the quality of care provided to the program’s beneficiaries. A fundamental problem with Medicare’s current quality measurement programs, particularly in FFS Medicare, is that they rely primarily on clinical process measures for assessing the quality of care provided by hospitals, physicians, and other types of providers, measures that may exacerbate the incentives in FFS to overuse services and fragment care. As well, some of the process measures are often not well correlated to better health outcomes, there are too many measures, and reporting places a heavy burden on providers. In Chapter 3, we examine which approaches to quality measurement are appropriate for each of the three payment models in Medicare: FFS Medicare, MA, and ACOs. We discuss an alternative to the current measurement system: using population-based outcome measures (e.g., potentially avoidable admissions for the FFS population in an area)

to evaluate and compare quality within a local area across Medicare's three payment models. We consider a small set of measures that would be less burdensome to providers and directly related to health outcomes. A population-based approach could be useful for public reporting of quality for all three models and for making payment adjustments within the MA and ACO models.

A population-based outcomes approach may not be appropriate for adjusting FFS Medicare payments in an area because FFS providers have not explicitly agreed to be responsible for a population of beneficiaries. Therefore, at least for the foreseeable future, FFS Medicare will need to continue to rely on provider-based quality measures to make payment adjustments. We find current provider-level quality measurement technology may not be sufficiently developed to support payment adjustments for all providers in all settings; for example, it may not address the full range of physician services. We discuss steps that Medicare could take in the short term to improve its provider-based quality measurement programs.

Financial assistance for low-income Medicare beneficiaries

In Chapter 4, we discuss how changing income eligibility for the Medicare Savings Programs (MSPs) could help low-income Medicare beneficiaries afford OOP costs under a redesigned Medicare FFS benefit package. The Commission has made two previous recommendations on this issue:

- The first recommendation, from 2008, was for the Congress to align the MSP income eligibility criteria with the Part D low-income drug subsidy (LIS) criteria, effectively increasing the full Part B premium subsidy to beneficiaries with incomes up to 150 percent of the federal poverty level. MSPs provide financial assistance with the Medicare Part B premium for beneficiaries with incomes up to 135 percent of the poverty level. Medicare's Part D prescription drug benefit incorporates a subsidy structure that provides assistance to beneficiaries with incomes up to 150 percent of the poverty level.
- The second recommendation, from 2012, was to redesign the FFS benefit package to balance two main goals: first, give beneficiaries better protection against high OOP spending, and second, create financial incentives for them to make better decisions about their use of discretionary care.

Because reducing beneficiaries' OOP costs (deductibles, copayments, or coinsurance) at the "point of sale" could undermine their incentives to make cost-conscious decisions about the health care they use, the redesigned FFS benefit package does not eliminate those costs. Without additional help, Medicare beneficiaries with limited incomes could have difficulty paying those OOP costs. Increasing the MSP income eligibility criteria to 150 percent of the poverty level would provide additional financial assistance to lower income beneficiaries by fully subsidizing their Part B premium, thus giving them resources to pay their OOP costs at the point of service. It therefore represents a targeted and efficient approach to help low-income beneficiaries. Chapter 4 also provides examples of variation in MSP eligibility across states.

Per beneficiary payment for primary care

The Commission has a long-standing concern that primary care services are undervalued by the Medicare fee schedule for physicians and other health professionals compared with procedurally based services. That undervaluation has contributed to compensation disparities: Average compensation for specialist practitioners can be more than double the average compensation for primary care practitioners. Such disparities in compensation could deter medical students from choosing primary care practice, deter current practitioners from remaining in primary care practice, and leave primary care services at risk of being underprovided. While Medicare beneficiaries generally have good access to care, in both patient and physician surveys, access for beneficiaries seeking new primary care practitioners raises more concern than access for beneficiaries seeking new specialists.

With the goal of directing more resources to primary care and rebalancing the fee schedule, the Commission made a recommendation in 2008 for a budget-neutral primary care bonus payment, funded by a reduction in payments for non-primary care services. The Patient Protection and Affordable Care Act of 2010 created a bonus program, but it was not budget neutral and thus required additional funding. The program provides a 10 percent bonus payment for primary care services provided by primary care practitioners, from 2011 through 2015.

The primary care bonus program expires at the end of 2015. The Commission believes that the additional payments to primary care practitioners should continue.

While the amount of the primary care bonus payment is not large and will probably not drastically change the supply of primary care practitioners, it is a step in the right direction. However, the Commission has become increasingly concerned that FFS is ill suited as a payment mechanism for primary care. FFS payment is oriented toward discrete services and procedures that have a definite beginning and end. In contrast, ideally, primary care services are oriented toward ongoing, non-face-to-face care coordination for a panel of patients.

In Chapter 5, we consider an option to continue the additional payments to primary care practitioners, but in the form of a per beneficiary payment. Replacing the primary care bonus payment with a per beneficiary payment could help move Medicare away from an FFS volume-oriented approach and toward a beneficiary-centered approach that encourages care coordination, including the non-face-to-face activities that are a critical component of care coordination. In establishing a per beneficiary payment for primary care, the Commission has considered several design issues: practice requirements for receipt of the payment, attribution of beneficiaries to primary care practitioners, and funding.

Site-neutral payments for select conditions treated in inpatient rehabilitation facilities and skilled nursing facilities

Site-neutral payments reflect the Commission's position that the program should not pay more for care in one setting than another if the care can safely and effectively be provided in the lower cost setting. In previous reports, the Commission has recommended site-neutral payments for certain services across the physician fee schedule and the hospital outpatient department payment system, as well as for select patients across long-term care hospitals and acute care hospitals.

In Chapter 6, the Commission focuses on site-neutral payment to two post-acute care facilities—IRFs and SNFs—that are paid under separate payment systems. Currently, payments for similar patients with the same condition can differ considerably between the two payment systems. Using several criteria, we selected three conditions frequently treated in IRFs and SNFs—major joint replacement, other hip and femur procedures (such as hip fractures), and stroke—and assessed the feasibility of paying IRFs the same rates as SNFs for these conditions. We found that the patients with the

two orthopedic conditions were very similar across the two settings. Differences in outcomes between IRFs and SNFs were mixed, with unadjusted measures showing larger differences between the settings and risk-adjusted measures generally indicating small or no differences between the settings. Thus, we find the two conditions represent a good starting point for a site-neutral policy. If IRFs were paid under current SNF policy for the two conditions, net IRF payments would decrease. However, the combined industry-wide effects on total payments to IRFs would be mitigated because under the design we explored IRFs would continue to receive add-on payments for the select conditions and current IRF payments for the majority of their cases. Patients recovering from strokes were more variable, and we conclude that more work needs to be done to more narrowly define the cases that could be subject to a site-neutral policy and those that could be excluded from it.

If payments for select conditions were the same for IRFs and SNFs, CMS should evaluate waiving certain regulations for IRFs, such as the requirements for intensive therapy and the frequency of physician supervision. Waiving certain IRF regulations would allow IRFs the flexibility to function more like SNFs when treating those cases. This flexibility would help level the playing field between IRFs and SNFs when treating patients with the site-neutral conditions.

Measuring the effects of medication adherence for the Medicare population

Medication adherence is viewed as an important component in the treatment of many medical conditions. Adherence to appropriate medication therapy can improve health outcomes and has the potential to reduce the use of other health care services. At the same time, improved adherence increases spending on medications. This issue has led to a proliferation of research on policies that encourage better adherence to medication therapy (e.g., reduced patient cost sharing) and the impact of improved medication adherence on health outcomes, typically measured by the use of other health care services.

In Chapter 7, we examine the effects of medication adherence on medical spending for the Medicare population. We examine how changes in cohort definitions and model specifications affect estimated effects on medical spending of Medicare beneficiaries with CHF adhering to a medication therapy.

The results of our analysis show that:

- Better adherence to an evidence-based CHF medication regimen is associated with lower medical spending among Medicare beneficiaries with CHF, but the effects likely vary by beneficiary characteristics (e.g., age).
- Beneficiaries who follow the recommended CHF therapies tend to be healthier before being diagnosed with CHF than nonadherent beneficiaries, with fewer medical conditions and lower medical spending.
- The effects of medication adherence diminish over time.

- The estimated effects of medication adherence on medical spending are highly sensitive to how they are modeled. For example, including whether beneficiaries died in the model reduced the effect on health care spending by half. The magnitude of the effect is also sensitive to how adherence is defined and the criteria used to select the study cohort.

Although our analysis examined only one condition (CHF) and is therefore not generalizable to other conditions or populations, our findings highlight the difficulty of estimating the effects of medication adherence. This difficulty may be exacerbated by the more complex health profiles of the Medicare population compared with the general population often used in studies of medication adherence. ■

CHAPTER

1

**Synchronizing
Medicare policy across
payment models**

Synchronizing Medicare policy across payment models

Chapter summary

Historically, Medicare has had two payment models: traditional fee-for-service (FFS) and Medicare Advantage (MA). Traditional FFS pays for individual services according to the payment rates established by the program. By contrast, under MA, Medicare pays private plans capitated payment rates to provide the Part A and Part B benefit package. Starting in 2012, Medicare introduced a new payment model: the accountable care organization (ACO). Under the ACO model, a group of providers is accountable for the spending and quality of care for a group of beneficiaries attributed to them. The goal of the ACO program is to give groups of FFS providers incentives to reduce Medicare spending and improve quality, similar to the incentives under the MA program.

A major issue is that Medicare's payment rules and quality improvement incentives are different and inconsistent across the three payment models. There are various approaches to making those rules more consistent. From the program perspective, the Commission is examining how to synchronize policy across payment models with respect to spending benchmarks, risk adjustment, and quality measurement and will be examining how to synchronize regulatory oversight. The Commission is also interested in the beneficiary perspective on synchronizing policy across payment models, including how beneficiaries learn about the Medicare program, choose plans, and respond to financial incentives.

In this chapter

- Payment models under the current Medicare program
- Synchronizing benchmarks for ACOs and MA plans
- Additional considerations in synchronizing benchmarks
- Moving forward

This chapter represents the Commission’s initial exploration of synchronizing Medicare policy across payment models and is not intended to be a definitive or comprehensive discussion. In this initial analysis, we focus on setting a common spending benchmark based on local FFS spending for MA plans and ACOs as a key element of synchronizing Medicare policy across payment models. Using an analysis of early results from the Pioneer ACOs, we illustrate that no one payment model is uniformly less costly than another model in all markets across the country. Which model is less costly and which ACOs and MA plans may want to enter the program would be sensitive to how benchmarks are set. To synchronize benchmarks, it is also necessary to address differences among the payment models in adjusting for risk, quality, and spending variations across areas. Detailed discussions of the issues related to risk adjustment and quality are included in Chapter 2 and Chapter 3 of this report. ■

Introduction

Under the current Medicare program, there are now three payment models through which beneficiaries can receive Medicare services: traditional fee-for-service (FFS), Medicare Advantage (MA), and accountable care organizations (ACOs). Traditional FFS pays for individual services according to the payment rates established by the program. By contrast, under MA, Medicare pays private plans a capitated payment rate to provide the Part A and Part B benefit package to plan enrollees.¹ In the ACO model (which started in 2012), a group of providers in an ACO is accountable for the spending and quality of care for a group of beneficiaries attributed to the ACO.

The Commission has for many years supported giving Medicare beneficiaries a choice between traditional FFS and private plans under MA. The original goals for private plans in Medicare were to provide a mechanism for introducing innovation into the program while constraining Medicare spending. Private plans have greater flexibility to develop innovative approaches to care and can more readily use care management tools and techniques than FFS. If private plans reduce spending and improve the quality of health care services, then Medicare beneficiaries' ability to choose between the traditional FFS and MA plans can lead to greater efficiency for the program. But MA plans are more likely to innovate if payment rates encourage them to do so. As the goals for private plans have shifted over time to include the goal of making MA plans available to all beneficiaries—even in markets where plans are not able to compete successfully with FFS based on cost—plan payments were increased above FFS levels. Higher payments have resulted in higher MA enrollment, but with some plans bringing little or no innovation to the program at higher costs. This situation is unfair to taxpayers and beneficiaries who subsidize the higher costs through higher program payments and higher Part B premiums.

In our June 2005 report, the Commission recommended setting the MA benchmarks at 100 percent of FFS costs, with differential payment for higher quality (Medicare Payment Advisory Commission 2005). That is, the Medicare program would pay the same amount for a beneficiary's enrollment in an MA plan, on average, as Medicare would expect to pay to cover the beneficiary in FFS Medicare. When the recommendation was made, the process for determining MA payments was not financially neutral relative to FFS cost. The administratively set

benchmarks, against which the MA plans bid, were often well above the local cost of FFS Medicare. One way the system could be financially neutral was if the benchmarks were more reflective of the cost of FFS Medicare.

The Commission maintains that to encourage beneficiaries to choose the model that they perceive as having the highest value in terms of cost and quality, the Medicare program should pay the same on behalf of each beneficiary making the choice. The Medicare program could not subsidize one choice more than another and still be financially neutral with respect to the beneficiary's choice to remain in the FFS system or enroll in an MA plan.

In the current context of three payment models, we interpret the principle of financial neutrality to mean that the benchmarks would be equal across payment models. Equal benchmarks, however, do not mean equal payments because payments may be adjusted for quality and other factors. This definition of equal benchmarks represents a refinement of the earlier definition of equal program payments for FFS and MA. In this chapter, we examine this refined definition of financial neutrality and its implications.

Payment models under the current Medicare program

Under the current Medicare program, there are three payment models through which beneficiaries can receive Medicare services: traditional FFS, MA, and ACOs. Traditional FFS pays for individual services according to the rates established by payment systems for each sector of the FFS program. Although there is some value-based purchasing that ties payment rates to the quality of care provided, providers overall bear little risk under traditional FFS. By contrast, MA plans and ACOs are paid under different sets of rules.

The MA payment model

Under current law, MA plans are required to cover all Medicare Part A and Part B benefits except hospice. With some exceptions, all MA plans must also offer an option that includes the Part D drug benefit, although payments for the Part D benefit are handled separately.² Plans may supplement Medicare benefits by reducing cost-sharing requirements, providing coverage of non-Medicare benefits, enhancing the Part D drug benefit, or providing a rebate for all or part of the Part B or Part D premium.

**TABLE
1-1**

MA program payment

Bid versus benchmark	Program payment	Additional premium for enrollee above the standard Part B premium	Additional benefits for enrollee
Bid higher	Benchmark	Difference	None
Bid equal	Benchmark	None	None
Bid lower	Bid + (50%, 65%, or 70% of the difference, based on a plan's quality ranking)	None	Yes

Note: MA (Medicare Advantage).

For each county, CMS sets the MA benchmark.³ An MA plan's payment from Medicare is based on how its bid compares with the local MA benchmark, which represents the maximum amount Medicare will pay to a plan in a given area on behalf of an MA enrollee. The plan's bid reflects its costs to provide the Part A and Part B benefit package for a beneficiary of average health status and includes plan administrative cost and profit. The local MA benchmark represents a bidding target and is set using statutory formulas and adjusted for the plan's quality ranking.⁴ If a plan's bid is above the benchmark, then the plan receives a payment equal to the benchmark and the MA enrollees have to pay a premium—in addition to the Part B premium—that equals the difference between the bid and the benchmark. If a plan's bid is at the benchmark, then the payment equals the benchmark. If a plan's bid is below the benchmark, then the plan receives a payment equal to its bid plus a "rebate." As of 2014, the rebate is a fixed percentage—50 percent, 65 percent, or 70 percent, depending on a plan's quality ranking—of the difference between the plan's bid and benchmark. (Table 1-1 summarizes how MA payment relates to the plan bid and the MA benchmark.) Once the rebate dollars are determined, the plan must return the rebate to its enrollees in the form of supplemental benefits or lower premiums.⁵ A more detailed description of the MA payment system can be found at http://www.medpac.gov/documents/MedPAC_Payment_Basics_13_MA.pdf.

The Pioneer ACO payment model

There are two models of ACOs: the Pioneer ACO and the Medicare Shared Savings Program (MSSP) ACO. In this chapter, we will be focusing on the Pioneer ACO due to earlier availability of data and the Pioneer ACO's faster movement toward full responsibility for the cost and

quality of care. Similar to MA plans, the Pioneer ACOs will have full responsibility for the ACO beneficiaries' cost of care for Part A and Part B services starting in 2015. In contrast, the MSSP ACOs can operate in a bonus-only model for up to three years (no downside risk) and therefore initially have weaker incentives to control costs than Pioneer ACOs. Because the Pioneer ACOs are responsible for all costs—including services provided by non-ACO providers—they have a strong incentive to continually convince the beneficiary that the ACO's providers are providing the highest quality care. The beneficiaries in ACOs are all free to go to non-ACO providers if they feel those providers will provide better or more convenient care. The responsibility for the cost of care in such an open network is similar to MA preferred provider organization (PPO) plans; however, the Pioneer ACOs' accountability for the cost of care differs from MA PPO plans in three ways. First, MA plans are not responsible for hospice care or other services after a patient enters hospice; ACOs remain responsible for all care after patients enter hospice. The Commission has recommended that MA plans be given this responsibility in the future (Medicare Payment Advisory Commission 2014).⁶ Second, about 90 percent of MA enrollees (as of March 2014) are in MA plans that include coverage for drugs (Part D coverage). Part D responsibility is currently not integrated into ACO benchmarks. Third, Pioneer ACOs have greater longitudinal responsibility for patients. Beneficiaries are prospectively assigned to the ACO if the beneficiary has historically used the ACO physicians for a plurality of their primary care visit, and the ACO is responsible for the beneficiary's costs for at least one full year after they are assigned to the ACO; that is, if the beneficiary becomes dissatisfied with the Pioneer ACO physicians and goes elsewhere, the Pioneer ACO is still responsible

Financial responsibility over time

Another issue for the synchronization of rules across payment models is the matter of financial responsibility over time. Pioneer ACOs remain responsible for their beneficiaries' Medicare spending for at least one year, even if those beneficiaries become dissatisfied and get their care outside of the ACO. Similarly, MA plans could be held accountable for some of the cost of beneficiaries who disenroll to FFS Medicare and have program spending above what would be expected. The Commission's past analysis suggests that MA beneficiaries who

disenroll and return to FFS have 16 percent higher FFS spending than their risk score would suggest, and other research also suggests those who disenroll have high spending (Medicare Payment Advisory Commission 2012, Newhouse et al. 2012). If there were a desire to make financial responsibility over time consistent between ACOs and MA plans, there could be a policy change so that an MA plan's Medicare payments would be reduced if the average costs of beneficiaries who disenroll from the MA plan were significantly higher than would be expected based on their risk scores. ■

for the costs of care for at least one year. In contrast, if an MA patient becomes dissatisfied with the MA plan and leaves the plan, the MA plan is no longer responsible once the patient leaves. The implication is that the incentives for ensuring patient satisfaction in the Pioneer ACO program are very strong.

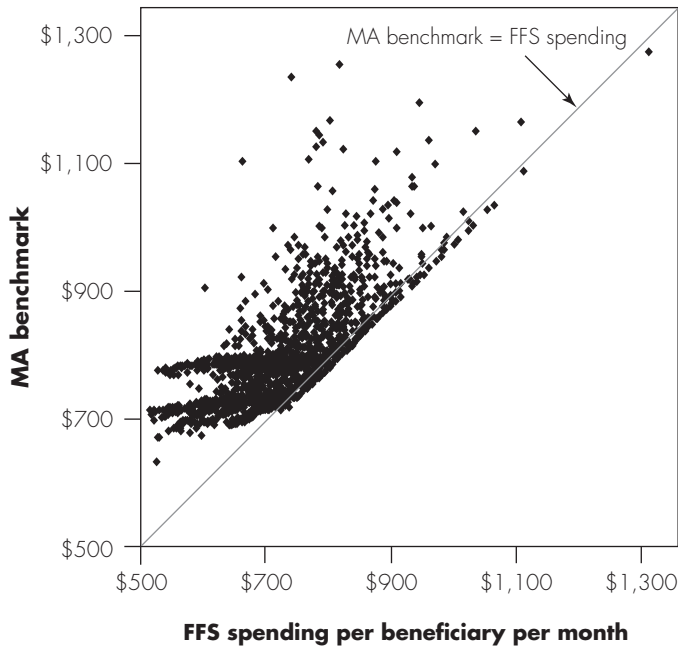
The mechanics of how ACOs are compensated also differ from MA plans. The MA plans enroll beneficiaries and then receive monthly capitated payments based on their benchmark and bids. The MA plans then pay providers and retain the difference between payments from the Medicare program and their payments to providers. The ACOs are different. Medicare directly pays providers FFS rates. The ACO then is paid shared savings based on the difference between what the program paid to providers and the ACO's benchmark. In the end, MA plans and Pioneer ACOs face similar financial incentives. However, ACOs avoid the extra cost of enrolling beneficiaries and paying claims, while MA plans face these extra overhead costs. Although there is a cost to enrollment and paying claims, the MA plans are the claims processing entity and can undertake utilization management activities such as requiring prior authorization for some services. The MA plans also have more flexibility to pay for innovative care delivery models that do not fit Medicare regulations and can direct beneficiaries to a limited network of providers. Thus, Pioneer ACOs have the advantage of lower overhead due to not paying claims and not having marketing costs, but the MA plans have the advantage of having more tools to control costs.

Unlike MA benchmarks, ACO benchmarks reflect historical FFS spending incurred by beneficiaries treated by the ACOs' physicians.⁷ In 2015, the benchmark for Pioneer ACOs roughly represents the maximum spending level to be incurred by the ACO's beneficiaries, above which penalties are applied and below which savings are accrued and shared among the ACO's providers.⁸ An ACO's target spending, or the benchmark, is calculated as follows. First, a subset of FFS beneficiaries is attributed to the ACO, based on its three years' claims history. (Unlike in MA plans, beneficiaries do not enroll in ACOs.) Second, an ACO's baseline spending is set equal to a weighted average of FFS spending for those beneficiaries over three years. Finally, the baseline spending is trended forward using the national growth rate in FFS spending.

At the end of each year, an ACO's actual spending is calculated as the sum of all FFS spending for the ACO's beneficiaries for the year, even if some of those beneficiaries get their care from non-ACO providers during the year (see text box). If the actual spending for the ACO's beneficiaries is below the benchmark, the difference is divided between the ACO and the Medicare program as shared savings. (The percentage of shared savings for the ACO ranges from 50 percent to 75 percent.) Under the first year of the Pioneer ACO program, some ACOs chose a two-sided risk arrangement (bonuses or penalties) and some chose a one-sided risk arrangement (bonuses only). In 2014 and all future years, the Pioneer ACOs face two-sided risk, where they are penalized for spending above the

FIGURE 1-1

FFS spending and MA benchmarks by county, 2012



Note: FFS (fee-for-service), MA (Medicare Advantage). FFS spending for 2012 is projected and excludes hospice, direct graduate medical education, and indirect medical education payments. FFS spending and MA benchmarks are standardized for a beneficiary of average health status. Data include U.S. counties only (not territories).

Source: MedPAC analysis of 2012 CMS MA bid data.

benchmark and receive shared savings when spending is below the benchmark.

As the brief descriptions of the payment rules for FFS, MA, and ACOs suggest, currently the Medicare program is likely to pay different amounts for similar beneficiaries across the three models. There are many reasons for this outcome, especially given the complexity of the payment rules. But one key factor is the difference in how the spending benchmark is set for MA plans and ACOs.

Relationship between FFS spending and MA benchmarks

MA benchmarks are set according to statutory formulas specified in the law, which include major changes introduced in the Patient Protection and Affordable Care Act of 2010 (PPACA). The PPACA provisions set county benchmarks for MA at specific percentages of FFS

spending levels. Beginning in 2017, after a transition period from 2012 through 2016, a county benchmark will be at one of four quartile levels—95 percent, 100 percent, 107.5 percent, or 115 percent of the FFS rate projected for that county for the year—with the quartile assignment based on the relative FFS spending levels among counties during the preceding year.⁹

Figure 1-1 compares local FFS spending and MA benchmarks in 2012 at the county level.¹⁰ Each point represents a county, with its FFS spending per beneficiary per month on the horizontal axis and its MA benchmark on the vertical axis. (There were a total of 3,144 counties in the United States in 2012.) The county-level FFS spending ranged roughly between \$500 and \$1,300, although the majority of counties were clustered between \$600 and \$800. Along the 45-degree line, the county-level FFS spending equals the MA benchmark. Figure 1-1 shows that the majority of counties were above the 45-degree line in 2012, with MA benchmarks above FFS spending. Counties with similar FFS average spending can have different MA benchmarks because 2012 is the first transition year for moving to benchmarks determined solely as a percentage of FFS, as provided for in PPACA.

Under current law, the MA benchmarks (before quality bonuses) are transitioning to those specified in PPACA. Figure 1-2 shows what MA benchmarks are likely to be by 2017 when PPACA benchmarks by quartile are in full effect. There are discrete changes at the boundaries of each quartile where benchmarks change from 115 percent to 107.5 percent, 107.5 percent to 100 percent, and 100 percent to 95 percent. Because the majority of counties had FFS spending between \$600 and \$800 in 2012 (shown in Figure 1-1), the FFS spending range for the two middle quartiles is small, between \$646 and \$751. In addition, Medicare beneficiaries are unevenly distributed across the county quartiles. For example, in 2012, 15 percent of Medicare beneficiaries were living in counties in the lowest FFS spending quartile compared with 44 percent in counties in the highest FFS spending quartile.

Relationship between FFS spending and ACO benchmarks

Pioneer ACO benchmarks are based on the historical Part A and Part B Medicare spending for individuals assigned to the ACO. These historical FFS spending numbers are trended forward to get the ACO's benchmark level of spending. By contrast, MA plans use county average

FFS spending trended forward by the CMS actuaries' projection of changes in spending for the forthcoming year (with rates announced in April of the preceding year). For these reasons, the FFS spending that is used to set MA benchmarks is not the same FFS spending used to set ACO benchmarks.

On average, the Pioneer ACOs' beneficiary-specific level of risk-adjusted spending in 2012 was slightly below the CMS actuaries' projected average FFS spending in the county. In other words, Pioneer ACO providers appeared to have slightly lower costs than average providers in 2012. However, that is only the average. Some ACOs have spending per beneficiary that is higher than we would expect given their beneficiaries' risk scores and average spending in their beneficiaries' counties of residence. Others have lower historical spending than would be predicted given their beneficiaries' risk scores and county of residence. As a result, some ACOs would do better if their benchmark were based on beneficiary-specific historical spending, and other ACOs would do better if their benchmark were based on the risk-adjusted average spending per beneficiary in the county.

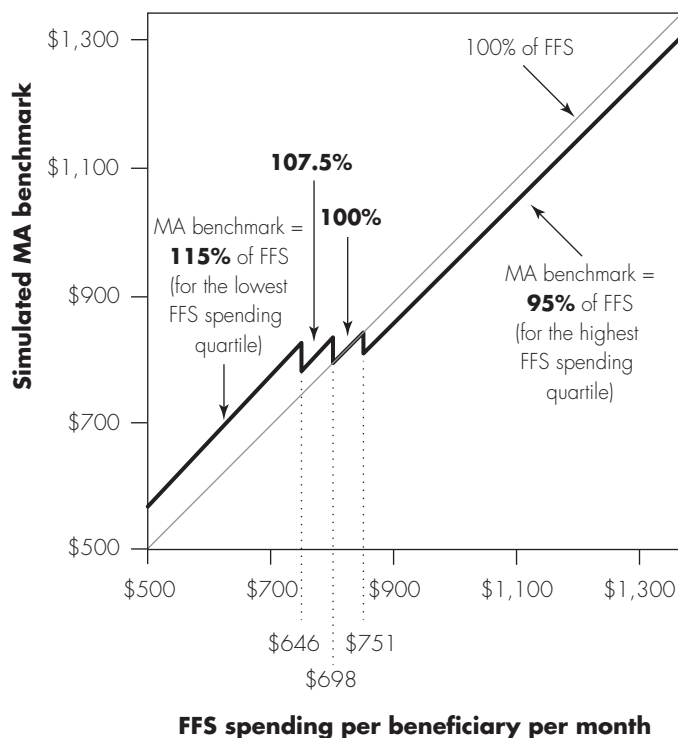
In cases where the ACO's level of service use is similar to the average for its county, the ACO will have an easier time generating shared savings in markets where historical service use is relatively high. The 32 Pioneer ACOs are slightly more likely to be in markets with relatively high FFS spending. The quartile of counties with the highest spending contains 69 percent of the Pioneer ACOs, 74 percent of Pioneer ACO beneficiaries, and 44 percent of all Medicare beneficiaries.

Synchronizing benchmarks for ACOs and MA plans

As a starting point for our analysis, we explore the concept of synchronized benchmarks by defining financial neutrality as setting the benchmark for ACOs and MA plans equal to spending in FFS—which we define to include both beneficiaries in traditional FFS and beneficiaries in ACOs. We include both populations in the benchmark because, as ACOs become more common, the population left in traditional FFS may become small and unrepresentative of the market. Conceptually, one might want to set the benchmark at the spending for a beneficiary served by the efficient health care delivery system, analogous to how the Commission looks at payments in

FIGURE 1-2

MA benchmarks specified in PPACA by county quartiles, 2012



Note: MA (Medicare Advantage), PPACA (Patient Protection and Affordable Care Act of 2010), FFS (fee-for-service). PPACA provisions set county benchmarks for MA at specific percentages of FFS spending levels. Beginning in 2017, after a transition period from 2012 through 2016, a county benchmark will be at one of four quartile levels (95 percent, 100 percent, 107.5 percent, or 115 percent of the FFS rate projected for that county for the year) with the quartile assignment based on the relative FFS spending levels among counties during the preceding year. The ranges of FFS spending for the quartiles shown in the figure are based on the quartile assignment of the PPACA benchmarks by CMS for 2012. Data include U.S. counties only (not territories).

Source: MedPAC analysis of 2012 CMS MA bid data.

the FFS settings relative to the efficient provider. However, we cannot estimate what that spending level is at this point. Eventually, it might be approximated as a function of MA bids, ACO spending, and spending in traditional FFS. For this chapter, we use local FFS as the starting point for the analysis. The Commission recommended setting MA benchmarks at local FFS in the past, and data on FFS spending are readily available.

The benchmark refers to the level of program spending that will trigger a potential bonus or penalty. For example, if spending in an ACO is materially below the benchmark,

the ACO would share in savings with Medicare. Similarly, if an MA plan bid is below the same benchmark, the MA plan would keep some of those savings through rebate dollars, which are used to fund the cost of extra benefits (including a profit margin and administrative expenses) or lower premiums to attract enrollees. By contrast, if ACO spending is above the benchmark, the ACO would be penalized by paying a share of the excess to Medicare. If the MA plan bid is above the same benchmark, it would become less attractive to beneficiaries because the beneficiary would need to pay the difference between the benchmark and the MA bid.

In this section, we illustrate that no one payment model (ACO, MA, or FFS) always yields the lowest program payments in all markets after benchmarks are synchronized to equal 100 percent of local FFS. In some cases, MA plans have lower program payments; in other cases, expected ACO or expected FFS spending would be lower. To illustrate the lack of dominance of one model, we simulate program spending for the three payment models under three different benchmark scenarios. The first scenario is based on the actual benchmarks for MA plans and ACOs in 2012; the second scenario is based on the synchronized benchmarks set equal to local FFS spending for both MA plans and ACOs; and the third uses MA benchmarks at the fully transitioned PPACA levels of 2017. We simulate the three scenarios to show that even after MA benchmarks are synchronized to FFS or moved to the levels mandated for 2017, no one payment model (ACO, MA, FFS) will uniformly have lower program spending than another model in all markets across the country.

The fundamental lesson from the simulations is that relative to FFS, MA and ACO spending varies by market. Driving volume to one model may not be desirable if that model is not always the best with respect to cost and quality. By setting benchmarks to be equal across each model, the models can compete in each market for beneficiaries. MA plans can compete for beneficiaries through the enrollment process, and ACOs can compete for beneficiaries by convincing their patients to continue using ACO primary care physicians. Policymakers may want a common benchmark to level the playing field and encourage beneficiaries to choose the model that will most efficiently give them the care and services that fit their individual preferences. However, whether there is a truly level playing field depends on several details in how overall financial neutrality across payment models is achieved.

Analysis of different benchmarks for ACOs and MA plans

Our simulation starts by showing how the current mix of benchmarks causes the relative Medicare program cost of the three payment models to vary across and within markets in 2012. Using data for 646,000 individuals assigned to Pioneer ACOs, we compared the expected FFS spending of these individuals with actual ACO program spending and simulated MA program spending. The simulated level of MA spending is what the Medicare program would have paid MA plans (including rebate dollars) if the 646,000 beneficiaries had chosen to join MA plans in proportion to each MA plan's current market share in each beneficiary's county of residence. The simulation uses three different sets of MA benchmarks: 2012 benchmarks, benchmarks synchronized to FFS, and 2017 benchmarks.

ACO spending was usually lower than MA simulated spending using 2012 MA benchmarks

As we have reported in the past, payments to Medicare Advantage plans in 2012 were higher on average than payments would have been under FFS (Medicare Payment Advisory Commission 2014). We modeled what MA payments would have been for the 646,000 beneficiaries assigned to Pioneer ACOs who live in markets where we have data on MA plan costs, including costs of MA HMO plans.¹¹ CMS estimated that the Medicare program would have spent an average of \$11,662 per beneficiary on these 646,000 beneficiaries under the traditional FFS model (Centers for Medicare & Medicaid Services 2013).¹² Among the 31 ACOs, 18 had lower spending than expected FFS spending, and 13 had higher spending than expected. Random variation drives much of the spending variance on an individual ACO basis, but on average both the Center for Medicare and Medicaid Innovation (CMMI) and an independent review suggest modest savings from the Pioneer ACO model relative to expected traditional FFS spending (Centers for Medicare & Medicaid Services 2013, L & M Policy Research 2013).

We computed expected payments for MA plans using data from CMS that showed the spending per capita on the combined Part A and Part B benefit plus rebate-financed supplemental benefits by county. We assumed that the ACO populations would have joined MA plans in proportion to the rates that other individuals in their county joined in 2012. For example, if a particular HMO now has a 50 percent market share, we assume that the plan would continue to have a 50 percent market share

**TABLE
1-2**

Lowest program-spending model for 31 sets of beneficiaries aligned with Pioneer ACOs under three different benchmark systems

Method for setting MA benchmark	Cases for which expected traditional FFS spending would be the lowest	Cases for which ACO model would produce the lowest spending	Cases for which MA payments would have been lower than traditional FFS or actual ACO spending
2012 MA benchmarks	12	18	1
MA benchmarks set at 100% of average FFS spending plus a quality bonus	8	11	12
2017 MA benchmarks	7	10	14

Note: ACO (accountable care organization), MA (Medicare Advantage), FFS (fee-for-service). A total of 31 Pioneer ACO sites had MA HMO plans in their market and were evaluated.

Source: MedPAC analysis of CMS claims files and MA enrollment and county-level payment files.

after ACO beneficiaries shifted to MA plans. A more detailed description of the methods is in online Appendix 1-A, available at <http://www.medpac.gov>. For the 31 ACO markets with significant MA penetration in 2012, the MA payment rates were, on average, 5 percent higher than expected traditional FFS payments.¹³ In contrast, in that year, payments for ACO beneficiaries' care were roughly 1.2 percent below expected FFS payments before paying out shared savings and were a net 0.7 percent lower than FFS after paying out shared savings bonuses.

When we compared estimated spending for each of the three payment models in the 31 areas we studied using 2012 MA benchmarks, we found that program spending was lowest in the ACO model in 18 of the 31 cases (Table 1-2, row 1). This finding is consistent with the aggregate ACO cost figures, external evaluations of the Pioneer ACO model, and findings from some private sector ACO evaluations. These analyses all point to ACOs, on average, reducing spending by a modest amount (1 percent to 3 percent) before bonuses were paid to the ACOs and saving 1 percent or less after paying out the shared savings bonuses (L & M Policy Research 2013, Song et al. 2012). Expected FFS spending was the lowest spending payment model in about one-third of the markets, possibly due to random variation, the lack of success of ACO activities in those markets due to FFS costs already being relatively low, or both. Simulated MA payment was the lowest spending payment model in only 1 of 31 markets. This

result is generally because MA plans have benchmarks set by law that are above FFS rates, allowing them to bid above FFS costs, and consequently the plans receive payments above FFS levels. Even if the plans bid below FFS levels for the basic Part A/Part B benefit, the rebate dollars that are provided to the plan to fund extra benefits often result in payments above FFS rates.

No one model was uniformly less costly with MA benchmarks set equal to FFS

The second simulation we conducted was to evaluate how much payments for the 646,000 ACO beneficiaries would have been if they had been in MA plans and if the MA benchmarks were moved to 100 percent of FFS spending for the average beneficiary in each county. If MA benchmarks were set at the local FFS spending per beneficiary and bids remained constant, simulated MA plan payments would have been roughly 1 percent less expensive than FFS spending on average due to a decline in benchmarks resulting in a reduction in rebate dollars that are used to pay for supplemental benefits. Savings could be materially greater than 1 percent if bids declined when the benchmark declined. However, even if the base MA benchmark were set equal to FFS spending, MA plans could still cost more than FFS Medicare in some markets due to quality bonuses pushing payments above FFS rates.

In our simulation, we assumed county-level FFS rates were at the benchmark and the quality bonuses moved the benchmark up by 3 percent on average to 103 percent of

FFS spending. Given these assumptions, MA would be the lowest program-spending payment model in 12 of the 31 markets in our simulation (Table 1-2, row 2, p. 11). In eight other markets, FFS would have lower program payments than MA due to the MA quality bonus or to the particular group of patients attributed to ACOs having lower FFS costs than the average in their counties. In these eight cases, FFS would also cost less than ACOs due to random variation or a failure of some ACOs to lower spending. In the remaining 11 cases, ACOs would continue to generate savings larger than MA; this could happen in cases in which MA plans bid near the FFS benchmark and ACO program spending is below average FFS spending in the county.

We also examined how payments would change under the proposed 2017 benchmarks. In 2017, the benchmarks will range from 95 percent to 115 percent of FFS spending plus potential increases in the benchmarks for quality bonuses.¹⁴ In this scenario, we would expect average payments to MA plans to be 3 percent lower than the average FFS program payments because, for most ACO markets, the new benchmark in 2017 will be 95 percent of FFS spending (100 percent of FFS spending with the quality bonus for qualifying plans) and some plans will bid below the benchmark. While MA is estimated to be the low-cost option in 14 of 31 markets under 2017 payment rules, there would still be some markets with benchmarks above 100 percent of local FFS spending (up to 115 percent plus quality bonuses) where program spending for MA would be more than for FFS or ACOs (Table 1-2, row 3, p. 11).

The main point of this simulation exercise is to show that no one payment model (MA, ACO, or pure FFS Medicare) would always be the low-cost model in all situations. The relative cost of the three models will depend on regional differences in care delivery, on the effectiveness of MA plans and ACOs in restraining cost growth, and on decisions regarding how quality bonuses and risk adjustment factor into the benchmarks.

Implications of synchronizing benchmarks for ACOs and MA plans

The simulations confirm what the Commission has said in the past: If more beneficiaries joined MA plans under 2012 payment rules, Medicare spending would increase because of high benchmarks. The level of the benchmark will determine the average relative costs across the three payment models. The second implication is that even under the proposed changes to the benchmarks that will take

place in 2017, no one payment model will always result in the lowest Medicare program payments. This finding implies that efficiency can be gained by synchronizing the benchmarks to level the playing field. Beneficiaries then can choose the model that best serves their preferences, which could be going to an ACO-affiliated primary care physician, seeing an unaffiliated primary care physician, or joining an MA plan and using a physician in the MA network.

It is important to note that which ACOs are likely to be successful depends on how the ACO benchmark is determined and whether patients served by ACO primary care physicians historically have payments above or below the county average. For this reason, how to set ACO benchmarks is a policy question because it affects which ACOs will want to participate in the program.

On the one hand, setting benchmarks based on the ACO beneficiaries' past experience, as is now the case, should attract high-cost physician practices into the ACO program. This result would occur because, if ACOs are initially high cost relative to other providers in the county, they have room to improve compared with their own historical benchmark. High-cost ACOs would enter and hope to bring costs down to earn shared savings bonuses. The rationale for using a historically based benchmark is that ACOs could learn to reduce unnecessary services. If this rationale were correct, then FFS spending would decrease in the area (because ACO beneficiaries remain in FFS), and if MA benchmarks were set to local FFS spending, the MA benchmarks would eventually also decrease. ACOs with historically low costs relative to the local area would be less likely to enter the program because they would have difficulty improving under benchmarks derived from their own beneficiaries' past experience.

On the other hand, if benchmarks were set at the local FFS average, ACOs that were low cost to begin with would be more likely to enter the program. Those ACOs would have an easier time improving relative to a benchmark based on county average spending because they are low cost and would start with a per beneficiary cost below the local FFS average. The rationale for setting benchmarks at local FFS spending would be to reward low-cost ACOs and expect that they would attract patients and other providers to them over time. This approach would eventually lower not only FFS Medicare spending (because ACO beneficiaries remain in FFS), but also MA benchmarks, if those are set at local FFS spending. However, Medicare spending may increase in the short run because shared savings bonuses

would be paid to low-cost ACOs that were already treating beneficiaries at below average costs without reward.

If the eventual goal is to synchronize MA and ACO benchmarks, then the ACO benchmarks could be transitioned from using beneficiaries' historical costs toward using average costs of beneficiaries in the county. Eventually, ACO benchmarks would be based solely on average FFS spending in the county (FFS spending is defined to include both spending on beneficiaries in traditional FFS and spending on beneficiaries in ACOs). The movement toward prospective county-level benchmarks could be designed to be gradual enough to bring some high-spending physician groups into the ACO model while not discouraging low-spending ACOs from participating.

In addition to affecting which providers enter the ACO program, we have seen some evidence that benchmarks can affect who leaves the ACO program. While the sample size is limited to 31 ACOs, those ACOs that had benchmarks below expected local FFS costs in their county tended to leave the program at a higher rate than those that had benchmarks above local FFS costs. In other words, ACOs that were the relatively low-cost providers in their county were more likely to leave the Pioneer ACO program. (One way to potentially encourage more ACOs to stay in the program is to let ACOs share some of their savings with beneficiaries; this approach could increase beneficiaries' use of ACO providers relative to out-of-network providers. For example, further work could be done to evaluate ways to give beneficiaries assigned to ACOs lower cost sharing when they visit ACO-aligned physicians.)

Additional considerations in synchronizing benchmarks

As a general principle, payment policy may adjust for factors that affect the expected cost of Medicare benefits. For example, beneficiaries in worse health have higher spending because they have higher use of health care. Medicare payments should accurately reflect and adjust for differences in expected cost based on health status. Additionally, relative to some reference level, Medicare payments may adjust upward for higher quality of care. One way to account for those differences in a payment model is to adjust spending benchmarks for those factors. Therefore, synchronizing benchmarks would also need to address how to adjust benchmarks with respect to risk

adjustment, quality measurement, and spending variations across markets. Detailed discussions of the issues related to risk adjustment and quality measurement are included in Chapter 2 and Chapter 3, respectively, of this report.

Risk adjustment

The purpose of risk adjustment is to adjust Medicare payments to accurately reflect how much each beneficiary would be expected to cost based on his or her health status. Without risk adjustment, health plans and providers at financial risk for patients' treatment costs will have financial incentives to avoid beneficiaries who are expected to cost more and seek out those who are expected to cost less. Under current rules, risk adjustment differs between MA plans and Pioneer ACOs.

MA plans receive monthly capitated payments for each enrollee, calculated by multiplying a base rate (which reflects the payment if an MA enrollee has the health status of the national average beneficiary) by a risk score (which indicates how costly the enrollee is expected to be relative to the national average beneficiary). Currently, the MA program uses the CMS–hierarchical condition category (CMS–HCC) model to risk adjust each MA payment. This model uses enrollees' demographics and medical conditions in a prior year collected into HCCs to predict their costliness.¹⁵

By contrast, Pioneer ACOs use prior spending for beneficiaries aligned with the ACO as the predictor of the beneficiary's costliness. In the Pioneer ACO model, the historical spending of beneficiaries attributed to the ACO is adjusted for spending growth based on their demographics. In other words, growth rates vary by demographic characteristics, such as age, sex, and eligibility for Medicaid.

If ACOs and MA plans are to move toward synchronized benchmarks, it may be reasonable for the risk-adjustment methods to converge as well. If payments are to become prospective, then the risk-adjustment method also would have to be prospective. The resulting method may be similar to the MA method of using prospectively determined risk scores for each beneficiary.

A current problem is that MA plan providers have an incentive to code MA patients more intensively, making it look as if MA patients' health has been declining more rapidly than similar patients in FFS. More intensive coding means higher payment rates for the MA plan (see Chapter 2 of this report). To limit potential distortions from more

intensive coding, a condition could be added that, for beneficiaries who stay in an MA plan for two years, MA payment rates would not increase faster than average just because the medical records suggest that the MA patients were getting sicker at a faster rate than unmanaged FFS patients. Any HCC risk scores that suggest that ACO or MA patients have health that is declining faster than expected would be reduced so the ACO or MA plan would not be rewarded for either intensive coding or poor quality care. The Pioneer ACOs (and MSSP ACOs) already have this limit on HCC growth; a similar approach could be applied to MA plans.¹⁶

Quality measurement

Quality measurement is an essential part of payment policy for MA plans and ACOs. Under current rules, MA plans are rewarded with a higher benchmark for higher quality, whereas ACOs are penalized by losing some of their shared savings if they do not meet quality benchmarks. In an MA plan, quality scores also are important signals for beneficiaries when choosing among plans, as well as being tied to bonuses. (The plan can get a bonus if it attains a specific level of overall quality. The bonus consists of a higher benchmark and allowing the plan to keep a larger share of the rebate. See the MA chapter in the March 2014 report to the Congress for details.) For ACOs, lower quality scores decrease the share of the savings that the ACO can keep. The quality protection in ACOs is that beneficiaries are free to choose other providers at any time if they feel that the care they are receiving is not of high enough quality. Thus, there is a certain asymmetry in the use of quality scores between MA plans and ACOs that will persist even if the payment benchmarks are more closely synchronized.¹⁷

To align quality measurement between MA plans and ACOs, the same set of population-based outcome measures could be used for both payment models because both MA plans and ACOs are accountable for a defined population. Bonuses or penalties for quality performance could also be similar. For example, MA plans with quality scores above the average for the area could receive higher payments than those with lower scores. Similarly, ACOs with quality scores above average could receive higher payments than ACOs with lower scores.

Concerning quality measurement for FFS Medicare, however, the Commission's current discussions distinguish between using population-based outcome measures for public reporting and making payment adjustments (see Chapter 3). For reporting purposes only, the same set of

population-based quality measures would be used across all three payment models.

For the purpose of adjusting payments, however, there would be differences between FFS and the other two models. Traditional FFS would continue to use provider-based quality measures for payment adjustments because FFS providers have not explicitly agreed to be responsible for a population of beneficiaries. Provider-specific quality payments, such as reductions in payments for high readmission or infection rates at specific hospitals, would need to continue as under current law.¹⁸ For the MA and ACO models, the population-based outcome measures reported for the FFS Medicare population—including both the population in traditional FFS and the population in ACOs—would be used as the reference level of quality to determine whether the MA plans and ACOs in the same local area would qualify for higher payments.¹⁹ In other words, only the MA plans and ACOs that outperformed FFS Medicare on those quality measures would get higher payments. Furthermore, adjustments to payments in quality would be comparable between MA and ACO models.

Spending variations across markets

For discussion in this chapter, we assume a common benchmark for ACOs and MA plans based on local FFS spending levels. If the benchmark were set on national FFS spending levels, ACOs and MA plans could earn bonuses without any changes in practice patterns in low-cost areas. In addition, MA plans and ACOs would be less likely to enter high-cost areas, where they are needed most.

Under current law, MA benchmarks in high-spending counties will be reduced to 95 percent of local FFS spending. There are other possible policy options. One would be to move toward competitive bidding and base benchmarks for MA plans and ACOs on the result of the competitive bidding. MA and ACO benchmarks also could be set at a blend of the bids and traditional FFS spending. This option could encourage MA plans and ACOs to enter the market by retaining a level of potential profits for those eliminating excess use. Another option would be to have beneficiaries pay more if they elect to forgo lower cost options. (For a general discussion of who should pay for spending variations across markets, see online Appendix 1-B, available at <http://www.medpac.gov>.)

Regardless of whether and how the benchmarks are adjusted for spending variations across markets, defining a market consistently across the payment models is important to a synchronization policy. Currently, MA

benchmarks are at the county level. The Commission has recommended using larger geographical areas—metropolitan statistical areas (MSAs) and health service areas outside MSAs—to define payment areas in order to reduce year-to-year volatility in benchmarks and payment rates and to decrease differences between neighboring areas (Medicare Payment Advisory Commission 2005). Under the recommendation, MA plans would bid to serve the entire payment area. This approach, however, may be problematic for the ACO model. For example, if benchmarks were set based on average spending in an MSA, then physician groups serving low-cost areas within the MSA could join an ACO, whereas those serving high-cost areas within the MSA could decline to join an ACO. In other words, through their selection of providers, ACOs could indirectly define a market that is smaller and more favorable than a market for MA plans. Yet, allowing different definitions of a market between ACOs and MA plans seems inconsistent with the goal of synchronizing policy across all three payment models.

Moving forward

There are various approaches to synchronizing Medicare policy across payment models. This chapter represents the Commission's initial exploration and is not intended to be a definitive or comprehensive discussion. From the program perspective, approaches include considering spending benchmarks, risk adjustment, quality measurement, and regulatory oversight. From the beneficiary perspective, approaches include considering how beneficiaries learn about the Medicare program, choose plans, and respond to financial incentives. The Commission will continue to develop those approaches in the future.

Our discussions so far have focused on the Medicare program's perspective, specifically on how the program pays under each model. However, we also need to consider what the payment models look like from the beneficiary's perspective. For example, for the beneficiary, traditional FFS and ACOs look essentially the same. Under both models, beneficiaries get the same Medicare benefit package. In the case of an ACO, beneficiaries' provider history determines their attribution to an ACO. Although ACO providers can informally encourage beneficiaries to stay within the ACO, there are no rules preventing beneficiaries from going to other providers outside the ACO. In fact, since beneficiaries do not enroll in ACOs but

rather are attributed to ACOs, some beneficiaries currently attributed to an ACO might not be aware of their inclusion in this payment and delivery arrangement.

By contrast, beneficiaries' experience in MA is different. First, they must enroll in an MA plan. Second, their benefits may vary across MA plans, such as different cost-sharing requirements and extra benefits if the plan bid is less than the MA benchmark. Finally, MA plans generally have a limited network of providers, a feature that contrasts with FFS Medicare and ACOs, where beneficiaries' choice of providers is unrestricted.

Consistent with the goal of encouraging beneficiaries to make cost-conscious choices about their health care, the Commission wants to better understand how beneficiaries actually make decisions and respond to financial incentives under Medicare. Currently, beneficiaries make choices regarding their options for Medicare coverage, such as choosing between traditional FFS and MA plans, in response to premiums and benefit designs. In general, their experience under the Medicare prescription drug benefit and MA suggests that some beneficiaries respond to financial incentives in choosing a plan, such as year-to-year changes in premiums and out-of-pocket spending. However, the decision-making process can impose nonmonetary and psychological costs, such as time and effort spent on researching plans. Moreover, beneficiaries find that the process of selecting or changing plans can be complicated and confusing. Given the perceived complexity associated with the process, the Commission recognizes that Medicare should make beneficiaries' decision making simpler and easier. For example, there are multiple ways of getting information, including in person, the 1-800-MEDICARE helpline, printed mailing, and online. Consistent presentation of information across channels may create choices that are easier to compare and could mitigate some of the costs in decision making.

From the program's perspective, the principle of financial neutrality is important in synchronizing Medicare policy across payment models. If the Medicare program provides a higher subsidy for one choice compared with another, the program would not be financially neutral with respect to the beneficiary's choice. However, if beneficiaries find it difficult to determine which payment model offers the highest value for them, or if they associate complexity with the process, the issue of how to design and communicate beneficiary incentives across payment models is also important. The Commission plans to examine what synchronized policy across payment models would look like from the beneficiary perspective. ■

Endnotes

- 1 The Part A and Part B benefit package in MA excludes hospice. In our March 2014 report, the Commission recommended including the Medicare hospice benefit in the MA benefits package beginning in 2016 (Medicare Payment Advisory Commission 2014).
- 2 In MA, private FFS plans have the option to offer Part D benefits, and Medicare medical savings account plans are not permitted to offer Part D coverage. All other plan types must offer at least one option with Part D coverage.
- 3 The local MA benchmark for a plan serving only one county is the county benchmark rate. Plans serving multiple counties would have a weighted benchmark based on the expected enrollment coming from each county. Regional PPO plans, another option within MA, bid in relation to regional benchmarks, which are set under a different methodology.
- 4 MA plans with a quality rating of 4 or higher (on a scale of 5) get a 5 percentage point increase in their benchmarks. In addition, MA plans with a quality rating of 4 or higher in 223 specified counties (based on their FFS spending, MA penetration rate in 2009, and urban floor status in 2004) get an additional increase of 5 percentage points in their benchmarks. For example, an MA plan with a quality rating of 4 in a county where the benchmark equals 95 percent of local FFS gets 100 percent of local FFS as its benchmark. In 2014, under the quality bonus program demonstration, MA plans with a quality rating of 3 or 3.5 also get higher benchmarks.
- 5 Part of the rebate dollars pays for the administrative cost and profit of those supplemental benefits other than reduction of the Part B premium or Part D premium.
- 6 Another difference is that beneficiaries with end-stage renal disease (ESRD) are not permitted to enroll in MA plans as new enrollees (but a beneficiary may remain enrolled in a plan after developing ESRD, and some MA special needs plans do enroll beneficiaries with ESRD). ACOs are responsible for the cost of care for beneficiaries with ESRD. The Commission has recommended doing away with the prohibition on MA enrollment of beneficiaries with ESRD (Medicare Payment Advisory Commission 2004).
- 7 The Pioneer ACOs originally tracked beneficiary-specific costs. However, starting in 2015, Pioneer ACOs will use a cross-sectional approach similar to the benchmarking in the MSSP program. Beneficiaries will still be prospectively assigned to the Pioneer ACOs, but the benchmark spending for those beneficiaries will be based on the risk-adjusted historical costs of patients (including decedents from prior years) served by ACO physicians, and those risk-adjusted costs will be trended forward to set the benchmarks.
- 8 In principle, spending above the benchmark would trigger penalties, and spending below the benchmark would trigger bonuses. But to account for the effect of random variation, there is a corridor of 1 or 2 percent around the benchmark where penalties and bonuses are not given. Quality is taken into account by varying the shared savings amount.
- 9 If a county changes its quartile position from one year to the next, then the percentage of the FFS amount determining the county benchmark will be the average of the two percentages in each of the different years.
- 10 FFS spending for 2012 is projected and excludes hospice, direct graduate medical education, and indirect medical education payments to make it comparable with the MA benchmarks, which exclude those categories of spending. Both FFS spending and MA benchmarks are standardized for a beneficiary of average health status.
- 11 There were initially 669,000 beneficiaries in Pioneer ACOs. We excluded beneficiaries who lived in counties not served by an HMO-model MA plan; these counties had only PPO options and relatively low enrollment. In these counties, there were so few MA beneficiaries, the bid data we have may not be good predictors of what bids would be if MA plan enrollment were expanded. As a result, our analysis is based on beneficiaries in 31 Pioneer ACOs.
- 12 This estimate uses the Pioneer benchmarks, which are based on historical spending for those beneficiaries and the national trend in FFS spending for 2012. This level of spending is higher than national average spending because beneficiaries are assigned to an ACO only if they have claims from that ACO's physicians over the three prior years. In other words, ACOs will not have new beneficiaries or beneficiaries without claims assigned to them. New (younger) beneficiaries and those who did not see a doctor (healthy beneficiaries) are less expensive. Not having any of these less expensive beneficiaries in the ACO results in higher than average costs per beneficiary. In addition, the ACOs tend to be in higher spending counties.
- 13 This difference between FFS and MA spending for these 31 sets of beneficiaries is similar to the average difference across the nation. In a nationwide examination of 2014 bids for all MA plans (excluding ESRD beneficiaries), MA spending was expected to be 6 percent higher than FFS (Medicare Payment Advisory Commission 2014).
- 14 Plans earning a quality bonus receive a 5 percentage point increase (or 10 percentage points in some counties) to their benchmark if they have a quality rating of 4 or higher in 2017. We assumed that 60 percent of enrollment would

qualify for the quality bonus in 2017, which is slightly higher than the 51 percent of enrollment that has 4 or more stars in 2014 (Medicare Payment Advisory Commission 2014). We expect an increase in those reaching 4 stars by 2017 due to historical trends and the fact that the incentive to move from 3 stars to 4 stars increases because the performance needed to achieve the bonus will shift from 3 stars to 4 stars by 2017. The results do not change materially if this assumption of 60 percent qualifying for bonuses is moved up or down. See online Appendix 1-A, available at <http://www.medpac.gov>, for details.

15 The 2013 model uses 70 HCCs, and the 2014 model uses 79 HCCs. See Chapter 2 of this report for a discussion of risk adjustment using the CMS–HCC model.

16 To address this issue, the MA program currently specifies a coding adjustment that reduces the risk score of all MA plans by a set percentage point amount each year. It does not differentiate by plan.

17 MA plans have penalties for lower quality in that rebate dollars are lower for lower quality plans, and CMS can terminate the contract of a plan that has persistently low quality.

18 Through 2017, ACO physicians are exempt from some quality programs, such as the value-based modifier for physician payments. This exemption holds for the provider’s ACO and non-ACO patients.

19 This definition—including both traditional FFS and ACO populations in the FFS Medicare population—is consistent with that used for the spending benchmark.

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CHAPTER

2

**Improving risk adjustment in
the Medicare program**

Improving risk adjustment in the Medicare program

Chapter summary

Health plans that participate in the Medicare Advantage (MA) program receive monthly capitated payments for each Medicare enrollee. Each capitated payment has two general parts: a base rate, which reflects the payment if an MA enrollee has the health status of the national average beneficiary, and a risk score, which indicates how costly the enrollee is expected to be relative to the national average beneficiary. The purpose of the risk scores is to adjust MA payments so that they accurately reflect how much each MA enrollee is expected to cost.

Currently, CMS uses the CMS–hierarchical condition category (CMS–HCC) model to risk adjust MA payments. This model uses beneficiaries’ demographic characteristics and medical conditions collected into hierarchical condition categories (HCCs) to predict their costliness. The demographic data are drawn from the same year for which their costs are predicted (prediction year), while HCCs are based on conditions diagnosed in the previous year (base year). Using diagnosis data from the previous year means the CMS–HCC model is prospective rather than concurrent. Concurrent risk adjustment uses conditions diagnosed in the prediction year to predict costs in the same year.

For beneficiaries who have a given condition, the CMS–HCC model has been shown to be a substantial improvement over the model that preceded it. The

In this chapter

- Analysis of predictive accuracy for conditions and cost categories
- Summary

predecessor used only beneficiaries' demographic information and predicted costs that were much lower than actual costs for many conditions and much higher than actual costs for healthy beneficiaries (Pope et al. 2004). Plans could benefit by attracting healthy beneficiaries and avoiding the unhealthy ones, a practice known as favorable selection.

Since CMS began using the CMS–HCC model, evidence indicates that favorable selection has been substantially reduced among beneficiaries who move from fee-for-service (FFS) Medicare to MA (Newhouse et al. 2012). This reduction in selection likely occurred because the CMS–HCC model predicts costs for specific conditions much better than the demographic model and because stronger restrictions now exist on when and how often beneficiaries can enroll in and disenroll from MA plans.

But Medicare costs vary widely among beneficiaries who have the same HCC classification. At the same time, the CMS–HCC model makes the same payment adjustment for all MA enrollees who have that HCC. Within a given HCC, payments are higher than actual costs for some beneficiaries and lower than actual costs for other beneficiaries. The result is that the CMS–HCC model predicts costs that are higher than actual costs (overpredicts) for beneficiaries who have very low costs and lower than actual costs (underpredicts) for beneficiaries who have very high costs. These prediction errors can cause overpayments for low-cost beneficiaries and underpayments for high-cost beneficiaries. Also, the variation in beneficiaries' costs is greater in some HCCs than in others, which can make for greater opportunities for favorable selection in some HCCs than in others. These differences in cost variation across HCCs can be addressed through any method that improves payment accuracy for high- and low-cost beneficiaries without focusing on specific HCCs.

Underpayments for high-cost beneficiaries and overpayments for low-cost beneficiaries raise an issue of equity among MA plans. Plans that have a disproportionately high share of high-cost enrollees may be at a competitive disadvantage relative to those whose enrollees have low costs. Moreover, there is a fairly strong correlation from one year to the next in beneficiaries' costs to the Medicare program. Also, after beneficiaries enroll in MA, plans are able to determine the cost of treating their enrollees. Consequently, plans have an incentive to encourage the disenrollment of their highest cost enrollees because they are underpaid for those enrollees, and the underpayments have a fairly high probability of persisting. Whether plans respond to this incentive is not clear, but it is present and undesirable. However, these high-cost beneficiaries may themselves have an incentive to disenroll if they find the less-restrictive structure of FFS Medicare

more beneficial to their circumstances than the network-based structure of MA plans. Further, overpayments and underpayments for specific groups could affect quality of care. Plans have less incentive to provide quality care to groups that are systematically underpaid.

A final issue to consider is how payment inaccuracies related to level of health care costs affect equity among MA plans, FFS Medicare, and accountable care organizations (ACOs). If payment equity among these three sectors is a goal, risk adjustment that results in more accurate payments for high-cost and low-cost beneficiaries is vital. For example, if the MA sector can attract low-cost beneficiaries and avoid high-cost beneficiaries, the risk-adjusted payments in the MA sector would exceed what their enrollees would cost in ACOs or FFS Medicare. The result would be program spending that is higher than if all beneficiaries were in FFS Medicare.

In this chapter, we investigate alternative methods discussed in the literature for improving how well risk adjustment predicts costs for the highest cost and lowest cost beneficiaries. We examine:

- *A hybrid model that blends concurrent and prospective risk adjustment.* The concurrent method applies to beneficiaries who have one or more conditions we identified as chronic, costly, and easy to verify. We want to use conditions that are easy to verify in concurrent risk adjustment because plans may have more incentive to upcode under concurrent risk adjustment than under prospective risk adjustment. For beneficiaries who do not have one of these conditions, we use prospective risk adjustment, a feature of the current CMS–HCC model.
- *Using beneficiaries’ base-year Medicare costs as an additional variable for predicting costs in the standard CMS–HCC model.* Base-year costs are a strong predictor of costs in the prediction year. Hence, they are strong risk adjusters.
- *A model that uses the standard CMS–HCC model but limits how much of each enrollee’s costs that plans are responsible for.* For example, plans could be responsible each year only for the first \$100,000 in services for each enrollee. Plans could be reimbursed for beneficiary-level costs that exceed the threshold through reinsurance, or plans could share costs above the threshold with Medicare.

A potential issue is that all three of these methods would introduce some degree of cost-based payment into the MA program, which could reduce incentives for plans to manage their enrollees’ conditions to hold down costs.

Our evaluation of the three methods indicates that for both the highest and lowest cost beneficiaries, the hybrid model is worse at predicting costs than the standard CMS–HCC model. In contrast, including prior-year costs in the standard model improves how well it predicts costs for high- and low-cost beneficiaries, while truncating costs would have a small to moderate effect on those groups. However, both alternatives present issues that would have to be addressed, which we discuss in detail. Because of the limitations of these models, the Commission concludes that administrative measures may be needed to address issues of payment inaccuracies for the lowest and highest cost beneficiaries.

Finally, underprediction for high-cost beneficiaries under the CMS–HCC model raises a question of whether MA plans have been adversely affected. A recent report indicates that MA plans are profitable for the most part and that special needs plans, which purportedly serve relatively high-cost beneficiaries, are more profitable than the average MA plan (Government Accountability Office 2013). Therefore, it does not appear that financial problems from underpredictions for high-cost beneficiaries pose significant challenges for MA plans. ■

Introduction

Health plans that participate in the Medicare Advantage (MA) program receive monthly capitated payments for each Medicare enrollee. Each capitated payment has two general parts: a base rate, which reflects the payment if an MA enrollee has the health status of the national average Medicare beneficiary, and a risk score, which indicates how costly the enrollee is expected to be relative to the national average beneficiary. The purpose of the risk scores is to adjust MA payments so that they accurately reflect how much each MA enrollee is expected to cost.

Over the years, CMS has used various methods for determining MA enrollees' risk scores. Currently, CMS uses the CMS hierarchical condition category (CMS-HCC) risk-adjustment model, which uses enrollees' demographic characteristics and medical conditions (such as diabetes and stroke) to predict their costliness. The demographic variables include age, sex, Medicaid status, institutional status, eligibility based on disability, and eligibility based on age but originally eligible because of disability.

Data for all demographic variables are drawn from the year in which beneficiaries' costs are to be predicted (the prediction year), except Medicaid status, which is from the previous (base) year. The assigned conditions are based on diagnoses recorded on physician, hospital outpatient, and hospital inpatient claims in the base year.¹ CMS collects the diagnoses into broader disease categories called hierarchical condition categories (HCCs). In the CMS-HCC model, some conditions have more than one HCC, which differ by severity of the condition. Examples include diabetes and cancer. The "hierarchical" part of HCC means that if a beneficiary has diagnoses that map into more than one HCC for a specific condition, only the highest cost HCC is used. To risk adjust payments for 2014 (the prediction year), CMS uses beneficiaries' conditions diagnosed in 2013 (the base year). Using conditions diagnosed in the previous year to risk adjust payments in the current year makes the CMS-HCC model prospective, as opposed to concurrent, which uses conditions diagnosed in the current year to predict costs in the same year.

Three general arguments have been made for using a prospective model (or against using a concurrent model).

- Prospective models give plans more incentive to manage their enrollees' care to avoid future costly conditions because adjustment of MA payment after

a condition has been diagnosed occurs more quickly in concurrent models than prospective models. For example, if an MA enrollee was diagnosed with a condition in January 2014, payment to the enrollee's plan would not be adjusted until 2015 under prospective risk adjustment, whereas payment would be adjusted in 2014 under concurrent risk adjustment.² Therefore, concurrent risk adjustment is closer to a cost-based model than is prospective risk adjustment.

- Because plans wait longer to have payments adjusted for a condition, they have less incentive to upcode relative to a concurrent model.
- Plans face less uncertainty about their revenue streams under a prospective model. Under concurrent models, payments are based on conditions diagnosed in the prediction year. But it takes time for those data to be processed so that payments can be adjusted. Plans' revenue may then require adjustments after the prediction year ends. For example, if an MA enrollee has a condition diagnosed in December 2014, CMS may not be able to make an adjustment to the plan's payment until 2015 because it takes time for a plan to collect and submit its enrollees' diagnosis data and for CMS to make the adjustment to the plan's payment. Under a prospective model, conditions from the base year are used to adjust payments in the prediction year, so the need for adjustments after the prediction year is smaller.

An underlying feature of the CMS-HCC model is that for beneficiaries who have the same HCC, it predicts costs that are below actual costs for some beneficiaries (underpredicts), predicts costs that are higher than actual costs for others (overpredicts), but predicts accurately on average. This is a feature of all models that use beneficiaries' conditions to predict costs. If plans do not have more information about their enrollees' costliness than CMS uses to risk adjust payments, then plans cannot systematically identify favorable risks. However, if plans have information about beneficiaries' costliness that CMS does not use to risk adjust payments, plans can use that information asymmetry to their benefit. Plans can try to attract beneficiaries they predict will have costs lower than payments and try to avoid beneficiaries they predict will have costs higher than payments (favorable selection).

Favorable selection was a substantial problem in the model that preceded the CMS-HCC model. The preceding model used only beneficiaries' demographic information and predicted costs that were much lower than actual

costs for many conditions and much higher than actual costs for beneficiaries who were healthy (Pope et al. 2004). Research indicates that favorable selection has decreased substantially under the CMS–HCC model among beneficiaries who move from fee-for-service (FFS) Medicare to MA (Newhouse et al. 2012). This reduction in selection likely occurred because the CMS–HCC model predicts costs for specific conditions much better than the demographic model, and plans may have limited abilities to attract healthier beneficiaries within HCCs. Moreover, the rate of disenrollment from MA plans has declined, which may be due to more accurate prediction of the cost of conditions or stronger restrictions on when and how often beneficiaries can enroll in and disenroll from MA plans.

However, some plans may have a disproportionately high share of enrollees who have high costs. In particular, special needs plans (SNPs) and the Program for All-Inclusive Care for the Elderly (PACE) are intended to focus on vulnerable, high-cost populations. Because the CMS–HCC model typically underpredicts the cost of the highest cost beneficiaries, these plans can be at a financial disadvantage. Also, as MA enrollees spend more time in MA plans, the plans gain information about the cost of treating each enrollee. Research indicates that each person’s health care costs the previous year are a relatively good predictor of their costs in the current year (we find a correlation coefficient of 0.4). Plans can use the information they have about their enrollees’ costs in the previous year to make predictions about how much they will cost in the current year. But the CMS–HCC model does not include beneficiaries’ prior-year costs. Therefore, plans have information about their existing enrollees’ costliness that the CMS–HCC model does not account for.

Later in this chapter, we use 2010 as the base year and 2011 as the prediction year to evaluate a CMS–HCC model. CMS has begun using this version of the CMS–HCC model in 2014.

We show that the CMS–HCC model severely overpredicts the costs in the prediction year for beneficiaries who had relatively low costs in the base year and severely underpredicts the costs in the prediction year for beneficiaries who had relatively high costs in the base year. These results raise concerns about equity among MA plans because plans that have a relatively high share of high-cost beneficiaries may be disadvantaged. However, a recent report indicates that MA plans are profitable, on average, and SNPs, which purportedly focus on high-cost

beneficiaries, have even higher profits than MA plans that serve a broad range of beneficiaries (Government Accountability Office 2013). Data on profitability in the PACE program are not as complete, but Commission staff obtained profit data from five PACE sites, which reported margins of 3 percent to 11 percent (Medicare Payment Advisory Commission 2012). These results suggest that financial problems from underpayments for high-cost beneficiaries may not be a widespread problem in MA.

Because plans have information about their enrollees’ historical costs and the CMS–HCC model does not include equivalent information, plans have an informational advantage over CMS. Plans have an incentive to use this advantage to retain beneficiaries who have low historical costs and encourage disenrollment of beneficiaries who have high historical costs. It is not clear whether plans have responded to this incentive, but it is present and undesirable. Also, high-cost beneficiaries may have an incentive to disenroll from MA plans because they may prefer the less-restrictive provider choices of FFS Medicare. At least one of these incentives appears to have manifested itself. Since CMS began using the CMS–HCC model, the beneficiaries who disenrolled from MA plans are much more costly than the average beneficiary in FFS Medicare, even though the rate at which beneficiaries disenroll from MA plans has declined (Medicare Payment Advisory Commission 2012, Newhouse et al. 2012).

If we desire financial neutrality among FFS Medicare, MA plans, and accountable care organizations (ACOs), overprediction for low-cost beneficiaries and underprediction for high-cost beneficiaries could present a problem. If MA plans have high shares of low-cost beneficiaries, payments in the MA sector that are risk adjusted with the existing CMS–HCC model would exceed what Medicare would pay for their enrollees in ACOs or FFS Medicare. The result would be higher program spending than if all beneficiaries were in FFS Medicare. The opposite would happen if MA plans have high shares of high-cost beneficiaries.

In a previous report, we examined three alternatives for improving how well the CMS–HCC model predicts costs for beneficiaries who have many conditions and generally have relatively high costs: add race and income to the standard model, use two years of diagnosis data rather than one to determine beneficiaries’ conditions (HCCs), and add each beneficiary’s number of conditions to the standard model. We found that adding race and income would do little to improve the model’s performance, but

using two years of diagnosis data and the number of conditions for each beneficiary would improve how well the model predicts costs for beneficiaries who have several conditions (Medicare Payment Advisory Commission 2012).

In this chapter, we explored alternative ways for improving the CMS–HCC model’s prediction of costs for both low- and high-cost beneficiaries. The model changes we investigated include:

- *A hybrid model that uses concurrent risk adjustment for beneficiaries who have been diagnosed with at least one condition we identified as chronic, costly, and easy to verify.* This model uses prospective risk adjustment for all other beneficiaries. Adding a concurrent component would provide plans larger, more immediate compensation for enrollees who develop high-cost conditions. However, concurrent adjustment raises concerns because it may reduce incentives for plans to manage their enrollees’ care and may increase incentives to upcode. That is why we limited concurrent risk adjustment to conditions that are easy to verify.
- *Adding beneficiaries’ base-year costs to the standard CMS–HCC model.*
- *A model that limits (truncates) how much of each beneficiary’s costs a plan is responsible for.* Costs that exceed the truncation point could be covered through reinsurance. We examined two truncated models: one in which plans’ costs for each enrollee are limited to \$250,000 and another in which plans’ costs are limited to \$100,000. We chose these two dollar amounts because those limits are what is typically examined in the literature (Winkelman and Mehmud 2007).

We also evaluated an adjustment to the CMS–HCC model that we discussed in the Commission’s June 2012 report to the Congress: adding beneficiaries’ number of conditions as a variable. In the June 2012 report, we found this adjustment would improve how well the CMS–HCC model predicts costs for beneficiaries who have several conditions. Although beneficiaries who have several conditions generally have relatively high Medicare costs, they are not necessarily among the highest cost beneficiaries. For example, only 16 percent of beneficiaries who have five or more conditions are among the 1 percent most costly. Therefore, in this analysis we found that adding the number of conditions for each beneficiary to the CMS–HCC model would make only a

small improvement over the standard CMS–HCC model in terms of predicting total costs for beneficiaries who have a history of high costs.

Analysis of predictive accuracy for conditions and cost categories

We use predictive ratios to evaluate the standard CMS–HCC model, a hybrid model, a version of the CMS–HCC model that includes beneficiaries’ base-year costs, and two versions of the CMS–HCC model that truncate the beneficiary-level costs that plans are responsible for. Predictive ratios indicate how well a model predicts costs for a group of beneficiaries who have the same health characteristic, such as a condition or level of health care costs. For a group of beneficiaries, a predictive ratio is the cost for the group as predicted by a risk-adjustment model divided by the actual cost of that group. Predictive ratios are similar to payment-to-cost ratios. All predictive ratios we calculated use predicted costs from 2011 as the numerator and actual costs from 2011 as the denominator.

A predictive ratio greater than 1.0 indicates predicted costs are greater than actual costs for a group (overprediction); a predictive ratio less than 1.0 indicates predicted costs are less than actual costs for a group (underprediction); and a predictive ratio that equals 1.0 indicates predicted costs equal actual costs for a group. Predictive ratios that differ from 1.0 are a concern because they indicate plans have an opportunity to benefit financially through favorable selection rather than through effective management of their enrollees’ care.

An alternative measure of model performance is the R^2 , which tells us how much of the variation in individual-level health care spending is explained by the model. An R^2 of 0.40 means a model has explained 40 percent of the variation in beneficiaries’ costs. The less variation explained by a model, the easier it is for plans to identify and use beneficiaries’ characteristics to engage in favorable selection. However, we prefer to use the predictive ratio because efforts to engage in selection are more likely to be based on health characteristics that define groups, not specific individuals.

We evaluated predictive ratios for nine specific conditions: cancer, diabetes, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), mental illness, schizophrenia, acute myocardial infarction (AMI),

Method for estimating and evaluating CMS–HCC model

In this analysis, we used a sample of 23.9 million beneficiaries in fee-for-service (FFS) Medicare. We randomly selected half the sample—11.9 million beneficiaries—to estimate coefficients in 5 risk adjustment models: a standard CMS hierarchical condition category (CMS–HCC) model, a hybrid model that combines prospective and concurrent versions of the CMS–HCC model, a model that adds beneficiaries’ base-year costs in FFS Medicare to the standard CMS–HCC model, a version of the standard CMS–HCC model in which beneficiaries’ prediction-year FFS costs are truncated at \$250,000, and a version in which beneficiaries’ prediction-year FFS costs are truncated at \$100,000. We used the other half of the sample that we did not use in the estimation work to evaluate model performance using predictive ratios. For this analysis, the prediction year is 2011, which is the year for which we are predicting beneficiaries’ costs. The previous year (2010) is the base year.

All beneficiaries in our sample had Part A and Part B coverage in FFS Medicare in every month of 2010. They also had at least one month of Part A and Part B coverage in FFS Medicare in 2011. These beneficiaries must have lived within the 50 states throughout 2010 and must not have had Medicare as a secondary payer at any time in 2010. In 2011, these beneficiaries must not have had Medicare as a secondary payer; must not have had end-stage renal disease status; must have lived within the 50 states throughout their enrollment in FFS Medicare; must not have received hospice care; and must not have been long-term institutionalized.

For each beneficiary, we created the following variables to estimate the coefficients (which indicate the

additional cost of a characteristic or condition) of the standard CMS–HCC model:

- 2011 costs to the Medicare program incurred while in FFS Medicare. We annualized these costs by dividing them by the fraction of 2011 that each beneficiary was in FFS Medicare. Most beneficiaries were in FFS Medicare for all of 2011, so they had a fraction of 1.0.
- 24 age/sex categories for 2011.
- 4 categories based on Medicaid status in 2010: Medicaid, female, and eligible for Medicare because of disability; Medicaid, female, and eligible because of age; Medicaid, male, and eligible because of disability; and Medicaid, male, and eligible because of age.
- 2 categories—one for male, one for female—indicating whether a beneficiary was eligible for Medicare in 2011 because of age but was originally eligible for Medicare because of disability.
- 79 hierarchical condition categories (HCCs). We obtained beneficiaries’ conditions from 2010 physician, hospital outpatient, and hospital inpatient claims. We collected these conditions into the broader HCCs.
- 6 disease interaction terms created from beneficiaries’ HCCs. These include cancer with immune disorders, congestive heart failure (CHF) with chronic obstructive pulmonary disease (COPD), CHF with renal disease, COPD with

(continued next page)

unspecified stroke, and all strokes. For our analysis, our base year (the year from which we draw conditions for prospective risk adjustment) is 2010 and our prediction year is 2011. We divided our analytic sample into seven percentile categories of Medicare costliness from the base year: at or below the 20th percentile, 20th to 40th percentile, 40th to 60th percentile, 60th to 80th percentile, 80th to 95th percentile, 95th to 99th percentile, and above

the 99th percentile. We calculated predictive ratios for each of these seven categories. We evaluate predictive ratios for categories of base-year costs rather than categories of prediction-year costs because base-year costs are a source of information that plans can use to identify favorable risks. It is unlikely that plans could use prediction-year costs for selection purposes because that information would not be available quickly enough for

Method for estimating and evaluating CMS–HCC model (cont.)

cardiorespiratory failure, diabetes with CHF, and sepsis with cardiorespiratory failure.

- 6 disabled/disease interaction terms for beneficiaries who were under age 65 (eligible because of disability) and had one of the following HCCs: opportunistic infections, chronic pancreatitis, severe hematological disorders, alcohol psychosis, cystic fibrosis, and complications of specified implanted device or graft.

In estimating the coefficients in the standard CMS–HCC model, we used beneficiaries’ annualized 2011 FFS costs as the dependent variable and the remaining variables listed above as the explanatory variables in a weighted least squares regression. The weights were the fraction of 2011 that each beneficiary was in FFS Medicare.

For the model that also includes beneficiaries’ base-year (2010) costs, we used the same variables for estimation plus the 2010 costs as an explanatory variable. However, we found negative coefficients on some variables, most notably those indicating cardiorespiratory conditions, heart disease such as acute myocardial infarction, and stroke. We excluded these HCCs from the model.

For the models in which we truncate beneficiaries’ FFS costs in 2011, we used the same variables for estimation except that the dependent variable (2011 annualized costs) was truncated at \$250,000 in one model and \$100,000 in the other.

The hybrid model was the most complicated to estimate. We used mutually exclusive subsamples to estimate both concurrent and prospective versions of the CMS–HCC model. The beneficiaries in the concurrent subsample had been diagnosed in the prediction year (2011) with one or more conditions that we identified as chronic, costly, and easy to verify. Cancer and cardiovascular disease are heavily represented, and we borrowed from an analysis of hybrid models in the literature to create this list (Dudley et al. 2003). The idea is to pay plans concurrently when beneficiaries develop a costly condition. But, concurrent risk adjustment gives plans incentive to upcode because of the shorter wait to have payments adjusted for newly diagnosed conditions. Therefore, we limited concurrent risk adjustment to conditions that are easily verified through audits. We placed beneficiaries who did not have a condition from the concurrent list in 2011 into the subsample for prospective risk adjustment.

Both the concurrent and prospective models were versions of the CMS–HCC model. In both models, we used each beneficiary’s 2011 annualized FFS costs as the dependent variable.

After estimating coefficients for the five models, we evaluated their efficacy using the half of the 23.9 million–person full sample that we did not use to estimate the models. For each beneficiary, we determined the 2011 Medicare costs predicted by each of the five models. We used these 2011 predicted costs to calculate predictive ratios in nine disease categories and seven categories that represent levels of beneficiaries’ FFS costs in 2010. ■

plans to use it, especially under the enrollment restrictions in the MA program.

Predictive ratios for condition categories are a point of interest because conditions are a source of information that plans could use to engage in selection activities before beneficiaries enroll. It is not the case that plans can explicitly know beneficiaries’ conditions before they

enroll, but they can use means such as benefit structure, provider networks, and advertising to appear unattractive to beneficiaries who have health characteristics that plans would like to avoid. Predictive ratios for categories of base-year costs are a point of interest for a different reason: Plans can use that information to engage in selection activities after beneficiaries enroll. For a discussion of our data and method, see the text box above.

**TABLE
2-1**

Predictive ratios under standard CMS-HCC risk adjustment model and alternative models for addressing payment inaccuracies for low-cost and high-cost beneficiaries

	Standard model	Hybrid model	Include prior-year costs	Truncate costs at \$250,000	Truncate costs at \$100,000
Conditions					
Diabetes	1.00	1.00	1.00	1.00	0.99
Cancer	1.00	1.00	1.00	1.00	1.00
COPD	1.00	1.00	1.00	1.00	1.00
CHF	1.00	1.00	1.00	1.00	0.99
Mental illness	1.01	1.00	1.01	1.01	1.01
Schizophrenia	1.01	1.01	0.99	1.01	1.00
AMI	1.02	1.01	1.24	1.02	1.02
Unspecified stroke	0.99	1.00	0.97	1.00	0.99
All strokes	1.00	1.02	0.99	1.00	1.00
Base-year cost					
≤ 20th percentile	1.62	1.87	1.39	1.62	1.63
20th–40th percentile	1.30	1.22	1.10	1.30	1.30
40th–60th percentile	1.10	1.00	0.95	1.10	1.10
60th–80th percentile	0.95	0.88	0.87	0.95	0.95
80th–95th percentile	0.86	0.81	0.92	0.86	0.85
95th–99th percentile	0.82	0.76	1.10	0.82	0.81
Above 99th percentile	0.71	0.65	1.18	0.74	0.81

Note: CMS-HCC (CMS-hierarchical condition category), COPD (chronic obstructive pulmonary disease), CHF (congestive heart failure), AMI (acute myocardial infarction). Beneficiaries' base-year costs are from the year before costs are predicted. Predictive ratios are total predicted costs for a group of beneficiaries divided by their total actual costs. In this table, predicted costs are from 2011 and base-year costs are from 2010.

Source: MedPAC analysis of 2010 and 2011 standard analytic files of physician/office claims, hospital inpatient claims, and hospital outpatient claims; 2012 Common Medicare Environment file from Acumen LLC; 2011 denominator file from Acumen LLC; 2011 beneficiary annual summary file from Acumen LLC; and 2011 risk score file from Acumen LLC.

The standard model predicts well for conditions, overpredicts for low cost, and underpredicts for high cost

We evaluated the version of the CMS-HCC model that CMS began using in 2014 to determine risk scores (standard model). This model has 24 age/sex categories, 79 condition categories defined by HCCs, 6 disabled (under age 65)/disease interaction terms, 6 disease-interaction terms, 4 dual-eligible terms, and 2 terms that indicate whether a beneficiary who is currently eligible on the basis of age was originally eligible because of disability.

The standard model produces an R^2 of 0.12, meaning it explains 12 percent of the variation in beneficiary-level costs. More important, we find this model predicts costs very well for all nine disease categories we specified above (Table 2-1). Among the beneficiaries in a disease category, the model makes prediction errors. Some predictions are

too high, some are too low, but these errors are largely random, so they offset each other. However, this model makes fairly large systematic errors in some of the base-year cost categories. For beneficiaries who have base-year costs at or below the 20th percentile, the predictive ratio is 1.62, meaning aggregate predicted costs are 62 percent above aggregate actual costs. In contrast, for beneficiaries whose base-year costs are above the 99th percentile, the predictive ratio is 0.71, meaning aggregate predicted costs are 29 percent below aggregate actual costs. Such large systematic errors in prediction can benefit plans that have high shares of low-cost beneficiaries and adversely affect plans that have high shares of high-cost beneficiaries.

An implication of these results is that if the enrollees in each MA plan have the same HCC profile as FFS beneficiaries, then there is no selection problem in the MA program. Predicted costs equal actual costs. Conversely, if MA plans have a higher share of very low-cost enrollees

or very high-cost enrollees than does FFS Medicare, then predicted costs will be different from actual costs and either favorable or adverse selection will be an issue.

Hybrid model has greater overprediction for low cost and underprediction for high cost than does the standard model

The hybrid model combines two versions of the CMS–HCC model: a concurrent version that includes only beneficiaries who have been diagnosed with at least one condition from a set of conditions that meet specific criteria and a prospective version for all other beneficiaries. We borrowed heavily from an existing analysis to create the list of conditions that defines the population for the concurrent version (Dudley et al. 2003). A number of conditions are represented, but the list is concentrated in cardiovascular disease and cancer. The intent is to include conditions that are chronic, costly, and easy to verify (meaning that specific test results or a few well-defined symptoms must exist before a patient can be clinically classified). The concurrent beneficiaries are 48 percent of all beneficiaries in our sample and have 83 percent of the costs in the prediction year.

Using a hybrid version of the CMS–HCC model would undoubtedly improve how well the model pays for high-cost cases in the *prediction* year since the concurrent portion of the model has an R^2 of 0.38 compared with 0.12 for the standard CMS–HCC model. However, we should not be strongly concerned about how well a model predicts costs for high-cost cases in the current year because restrictions on when and how often beneficiaries can enroll in or disenroll from the MA program strongly limit prediction-year costs from being used to identify favorable risks. Instead, our focus is on how well costs are predicted for beneficiaries who have high costs in the *base* year.

Our analysis of how well the hybrid model predicts for categories of base-year costs shows that it performs worse than the standard CMS–HCC model. Predictive ratios indicate that for beneficiaries in the lowest 20 percent of base-year costs, overprediction is greater under the hybrid model than the standard model—87 percent versus 62 percent (Table 2-1). Also, for beneficiaries whose base-year costs were above the 99th percentile, predicted costs are 35 percent lower than actual costs under the hybrid model, but only 29 percent lower under the standard model.

Total predicted cost is the same in both models. Therefore, when a predictive ratio in one of the base-year cost

categories increases, it must decrease in at least one other category. Because predictive ratios decline in the six highest cost categories and increase in the “at or below 20th percentile” category, predicted costs shift from the six highest cost categories to the lowest cost category under the hybrid model.³

The underlying cause of this shift appears to be that some of the beneficiaries who have very low base-year costs in 2010 (those in the “at or below 20th percentile” category) developed conditions in 2011 that they did not have in 2010. Indeed, the mean number of HCCs for this group increased from 0.2 using the 2010 diagnoses to nearly 0.5 using the 2011 diagnoses. This increase causes predicted costs for 2011 for these beneficiaries to be much higher under the hybrid model—which uses conditions from 2011 for some beneficiaries—than under the standard model—which uses conditions from 2010 to predict costs in 2011 for all beneficiaries. At the same time, we use actual costs from 2011 to determine predictive ratios for both models. Therefore, higher predicted costs in the hybrid model produce a higher predictive ratio. In contrast, some beneficiaries who were among the 1 percent most costly in 2010 had fewer conditions in 2011, and the mean number of HCCs for this group decreased from 6.7 in 2010 to 4.5 in 2011. This decrease in conditions causes the predicted costs and, consequently, the predictive ratio for this group to decline under the hybrid model.

Adding base-year costs to the standard model reduces overprediction for low cost and creates overprediction for high cost

To examine the effects of using beneficiaries’ base-year costs in risk adjustment, we added each beneficiary’s cost from 2010 (base year) to the standard CMS–HCC model to predict beneficiaries’ 2011 (prediction year) Medicare costs. Adding base-year costs improved the R^2 from 0.12 to 0.18. Also, the predictive ratios for the nine conditions in our analysis generally continue to be close to 1.0 after adding the base-year costs (Table 2-1).⁴

In terms of predictive ratios for the seven base-year cost categories we have analyzed, adding base-year costs to the CMS–HCC model produces four interesting changes relative to the standard model:

- The large overpredictions of costs in the two lowest cost categories (at or below 20th percentile and 20th to 40th percentile) decrease substantially (Table 2-1).

- The large underpredictions of costs in the two highest cost categories (95th to 99th percentile and above 99th percentile) become fairly large overpredictions.
- Predicted costs shift from the four lowest cost categories (resulting in lower predictive ratios) to the three highest cost categories (resulting in higher predictive ratios).
- Costs are overpredicted for the lowest and highest cost beneficiaries and underpredicted for those whose costs are in the middle of the distribution.

Clearly, adding base-year costs would help plans that have high shares of high-cost enrollees and make high-cost beneficiaries more financially attractive to plans. However, it raises questions about how plans would view enrollees whose costs fall in the middle of the cost distribution.

Using base-year costs is a great concern because it may affect plans' incentives to manage their enrollees' care to hold down costs. It could also penalize plans that actually do so because payments increase as enrollees' base-year costs increase. This issue received considerable attention in a report from the Society of Actuaries, which included warnings about undesirable incentives (Winkelman and Mehmud 2007). However, other research is more optimistic about using base-year costs and suggests using nonpreventable hospital stays as a proxy for base-year costs to counteract incentive problems (Brown and Schone 2013). The idea is that if a plan has a lot of inpatient stays that could not have been prevented even with good care management, then payments should be increased. However, it is not known how well this variable would work as a proxy for base-year costs, nor is there a clear definition of nonpreventable inpatient stays.

Truncating costs would have small to moderate improvement among high-cost beneficiaries

The truncated model uses the standard CMS–HCC model but truncates the costs of beneficiaries that exceed a dollar threshold. Costs beyond the threshold could be covered by reinsurance. We examined the effects of two different truncation levels, \$250,000 and \$100,000.

In general, the effects of truncating the enrollees' costs are nearly negligible, with the exception of those whose base-year costs were in the top 1 percent. For the nine conditions analyzed, the predictive ratios are similar in the standard model and the two truncation models. The same

is true for the six lowest base-year cost categories (Table 2-1, p. 30).

The only appreciable change occurs in the category of beneficiaries who had base-year costs above the 99th percentile. When we truncate costs at \$250,000, the extent of underpayment fell slightly, from 29 percent to 26 percent. Truncating costs at \$100,000 produces a stronger result, decreasing underpayment from 29 percent to 19 percent. It is not surprising that the nontrivial effects occur only in the highest cost category because only 0.03 percent of beneficiaries had prediction-year costs that exceeded \$250,000, and only 0.6 percent of beneficiaries had prediction-year costs that exceeded \$100,000.

While a policy that limits plans' exposure to unusually high costs may improve the predictive ratio in the highest cost category, such a policy has a significant drawback. Truncating the costs of MA plans is a step toward cost-based payments, which can reduce plans' incentives to manage care and hold down costs. Moreover, limitations on risk may be justified when plans face substantial uncertainty about the risk profile of their enrollees, but this is unlikely the case for MA plans. The MA program has existed for many years, so plans should have little uncertainty about the risk profile of their enrollees. Also, plans typically have enough enrollees that expenses from very costly enrollees should be largely offset by financial gains from low-cost enrollees.

Summary

The CMS–HCC model appears to have reduced the extent of favorable selection among beneficiaries who move from FFS Medicare to MA. However, it still substantially overpredicts the cost of the least costly beneficiaries and underpredicts the cost of the most costly beneficiaries. These systematic prediction errors can benefit plans that have a relatively high share of low-cost enrollees and can disadvantage plans that have a relatively high share of high-cost enrollees. Moreover, plans have information about their enrollees' historical costs, and beneficiaries' historical costs have a fairly strong correlation with their future costs. At the same time, the CMS–HCC model does not adjust payments for enrollees' historical costs. Plans can use this informational asymmetry to their advantage. Evidence suggests that plans may be doing just that because beneficiaries who disenroll from MA plans and return to FFS Medicare are much more costly than the

average FFS beneficiary (Medicare Payment Advisory Commission 2012, Newhouse et al. 2012). However, it is also possible that those who disenroll from MA plans prefer the less-restrictive provider choices of FFS Medicare.

We evaluated three alternative approaches to improving how well the standard CMS–HCC model predicts costs for beneficiaries who had high costs or low costs in the base year: a hybrid model that mixes concurrent and prospective risk adjustment; a model that includes beneficiary-level cost data from the base year; and a model that truncates the beneficiary-level costs that plans are responsible for. We evaluate performance for beneficiaries who have high or low base-year costs rather than high or low prediction-year costs because restrictions on enrollment and disenrollment make prediction-year costs less important in terms of affecting plans’ selection incentives. We find that the hybrid model would actually perform worse than the standard model, while the model that includes base-year costs and the model that truncates costs would improve the accuracy of payments for the lowest and highest cost beneficiaries.

But using base-year costs is not without problems because it may reduce plans’ incentives to manage their enrollees’ conditions to hold down their costs. In fact, it can reward plans that fail to do so and penalize plans that do. One suggestion has been to use the number of nonpreventable inpatient stays among a plan’s enrollees as a proxy. However, it is not clear what defines nonpreventable inpatient stays or how well it would perform as a proxy. In addition, adding base-year costs resulted in underprediction of costs for beneficiaries who fell in the middle of the cost distribution.

A model that truncates costs could be coupled with a system of reinsurance, which would add a small degree of cost-based payment and could reduce incentives to hold

down costs. Also, it would increase plans’ uncertainty about their revenue streams. Currently, plans receive capitated payments for each enrollee, and these payments are largely known ahead of time. Under a model that has truncated costs coupled with reinsurance, plans would receive a smaller capitated payment but also a separate reinsurance payment. The reinsurance payments would be paid later than the capitated payments. Unlike capitated payments, the amounts that plans would receive in reinsurance payments are largely unknown ahead of time and would result in a revenue shift among plans.

In summary, the alternative approaches we evaluated either do not improve the performance of the CMS–HCC model or could create other problems, including less incentive for plans to manage care and hold down costs, penalizing plans that do so, and increasing incentives to upcode. In a previous report, we identified two modifications to the CMS–HCC model that would improve risk adjustment for beneficiaries who have several conditions and are relatively costly: adding beneficiaries’ number of conditions and using two years of data to determine beneficiaries’ HCCs rather than the single year that CMS uses (Medicare Payment Advisory Commission 2012). However, we find that adding the number of conditions would improve prediction for very high-cost and very low-cost beneficiaries by only a small amount, and we doubt that using two years of data would provide much improvement. Therefore, we may need to consider administrative measures to address the imprecision of the CMS–HCC model and incentives for plans to engage in selection. One possibility is penalties for disenrollment of high-cost beneficiaries. Also, CMS may be able to obtain helpful information about factors that contribute to disenrollment through surveys of disenrollees and evaluating disenrollees for changes in their risk factors over time. ■

Endnotes

- 1 Providers record the conditions on claims using International Classification of Diseases, Ninth Revision, codes.
- 2 Under perfect concurrent adjustment, the MA payment would be adjusted simultaneously with the diagnosis of the condition. However, before adjustment can be made, plans must gather the data on their enrollees' diagnoses and send them to CMS, and CMS must process those data and adjust the payments.
- 3 Although the hybrid model does worse than the standard model at predicting costs for beneficiaries who have high costs in the *base* year, it does much better than the standard model at predicting costs for beneficiaries who have high costs in the *prediction* year.
- 4 An exception is AMI, which has a predictive ratio of 1.24. This exception occurs because base-year costs are very high for beneficiaries who had AMI diagnosed in 2010, and prediction-year costs are much lower than base-year costs for these beneficiaries. When we add base-year costs to the CMS–HCC model, the adjustment to predicted costs for AMI patients is very large, resulting in a high predictive ratio.

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CHAPTER

3

**Measuring quality of care
in Medicare**

Measuring quality of care in Medicare

Chapter summary

The Commission is considering alternatives to Medicare’s current system for measuring the quality of care provided to the program’s beneficiaries. A fundamental problem with Medicare’s current quality measurement programs, particularly in fee-for-service (FFS) Medicare, is that they rely primarily on clinical process measures for assessing the quality of care provided by hospitals, physicians, and other types of providers—measures that may exacerbate the incentives in FFS to overprovide and overuse services and contribute to uncoordinated and fragmented care. In addition, some of these process measures are often not well correlated to better health outcomes, there are too many measures overall, and reporting the data needed for the measures places a heavy burden on providers.

The Commission has been considering an alternative quality measurement approach that would use population-based outcome measures to publicly report on quality of care across Medicare’s three payment models—FFS Medicare, Medicare Advantage (MA), and accountable care organizations (ACOs)—within a local area. A population-based outcomes approach also could be useful for making payment adjustments within the MA and ACO models. However, this approach may not be appropriate for adjusting FFS Medicare payments in an area because, unlike under an ACO or MA plan, the providers under FFS Medicare do not explicitly accept responsibility for the care of a population of beneficiaries. Therefore, at least for the foreseeable

In this chapter

- History of the Commission’s work on quality in Medicare
- Concept for a new approach to quality measurement
- How population-based outcome measures could be applied to FFS Medicare, ACOs, and MA plans in a local area
- Issues for further Commission analysis
- Conclusion

future, FFS Medicare will need to continue to rely on provider-based quality measures for the purpose of making FFS payment adjustments. Current provider-based quality measurement technology may not be sufficiently developed to support payment adjustments, particularly with respect to physician services, but there are steps that Medicare can take in the short term to improve these provider-based quality measurement programs.

In addition to population-based outcomes, another area of quality measurement that the Commission is exploring is the feasibility of measuring the potentially inappropriate use of clinical services, specifically the type of inappropriate use known as overuse. While overuse is more likely to occur in payment models such as FFS Medicare that create incentives to overprovide services with little or no benefit for patients, evidence of overuse also has been found in capitated payment arrangements. Because of the potential for harm to beneficiaries and wasteful program spending resulting from overuse, the Commission examined the potential of applying overuse measures to Medicare. The results of these analyses were encouraging, and we plan to continue to explore overuse measurement as another avenue to improve the quality of care for beneficiaries. ■

Introduction

The Commission has been making quality measurement recommendations for Medicare since 2003. The Commission's initial work in this area was spurred in part by the publication of two reports by the Institute of Medicine in 1999 and 2001, which detailed poor quality of care across the U.S. health care system and proposed steps to improve it, including the development and use of evidence-based quality measures (Institute of Medicine 2001, Institute of Medicine 1999). The Commission also established a position that Medicare should no longer pay providers of care solely on the basis of the volume of services rendered, but also on the quality of the care delivered.

The Commission's recommendations on quality have followed two paths. First, Medicare should use a set of process, outcome, and patient experience measures to evaluate the quality of care of Medicare Advantage (MA) plans and of providers in fee-for-service (FFS) Medicare (each provider type (hospitals, physicians, etc.) would be evaluated separately). The set of measures should be small to minimize the administrative burden on providers and CMS. Second, Medicare should base a small portion of payments to FFS providers or MA plans on their performance on the selected quality measures. The Commission has stated that outcome measures, such as mortality and health care-associated infection rates, should be weighted most heavily in Medicare's pay-for-performance programs.

Over the past 10 years, the Congress has enacted quality reporting programs for almost all of the major FFS provider types and MA plans and has gone further to mandate pay-for-performance programs (which Medicare refers to as value-based purchasing) for hospitals, dialysis facilities, MA plans, and physicians. Pay-for-performance is also a central component of Medicare policy for accountable care organizations (ACOs).

A decade ago, most quality measurement technology, such as the Healthcare Effectiveness Data and Information Set[®] (HEDIS[®]), was designed to detect underuse of clinical services (e.g., preventive care and treatment of chronic diseases) in health plans. The Commission evaluated the feasibility of using these clinical process measures, as well as outcome measures such as inpatient mortality rates and patient experience, and made a number of recommendations about how to reliably assess quality in FFS by provider type and over time.

However, over the past few years the Commission has become increasingly concerned that Medicare's current quality measurement approach has gone off track in the following ways:

- It relies on too many clinical process measures that, at best, are weakly correlated with health outcomes and that reinforce undesirable payment incentives in FFS Medicare to increase volume of services.
- It is administratively burdensome due to its use of a large and growing number of clinical process measures.
- It creates an incentive for providers to focus resources on the exact care processes being measured, whether or not those processes address the most pressing quality concerns for that provider. As a result, providers have fewer resources available for crafting their own ways to improve the outcomes of care, such as reducing avoidable hospital admissions, emergency department visits, and readmissions and improving patients' experience of care.

In short, Medicare's quality measurement systems seem to be increasingly incompatible with the Commission's goal of promoting clinically appropriate, coordinated, and patient-centered care at a cost that is affordable to the program and beneficiaries. A description of the important steps in the evolution of the Commission's work on quality is provided in the next section. We then describe an alternative approach to measuring quality in Medicare that is more compatible with the Commission's long-term vision for the program.

History of the Commission's work on quality in Medicare

In its June 2003 report to the Congress, the Commission recognized that Medicare payment systems were, at best, neutral toward quality: high-quality providers were paid no more than low-quality providers, and Medicare's payment policies could actually discourage the provision of high-quality care (Medicare Payment Advisory Commission 2003). For example, hospitals are paid more for treating readmissions for complications that resulted from low-quality care in the hospital, and if they took steps to decrease readmissions, their revenues would fall. In addition, because beneficiaries lacked information about

quality differences across providers, they had difficulty identifying high-quality providers.

The Commission's June 2003 report considered a range of incentives to increase quality, including public reporting, quality-based payment differentials for providers and plans, cost-sharing differentials for beneficiaries, flexible oversight, shared savings, risk sharing, and capitation. Drawing on experiences in the private sector, available quality measures, and Medicare's administrative capabilities, the Commission recommended that Medicare pursue demonstrations of quality-based provider payment differentials and revise payment structures to reward quality improvements. The Commission concluded that Medicare managed care plans, dialysis providers, and certain post-acute care providers were promising areas for pay-for-performance programs.

Development of principles for Medicare pay-for-performance programs

In March 2004, the Commission formally incorporated quality measures into its FFS Medicare payment adequacy discussions and examined a number of quality measures: potentially preventable admissions (PPAs), hospital mortality (including in the hospital and 30 days postdischarge), hospital processes of care, patient safety and adverse events in hospitals, preventive ambulatory care, and beneficiary experience of hospital care (as measured by results from the Hospital Consumer Assessment of Healthcare Providers and Systems[®] (H-CAHPS[®]) survey) (Medicare Payment Advisory Commission 2004). The report also included measures of Medicare managed care processes (as measured by HEDIS) and patient experience (as measured by CAHPS).

In addition, the Commission recommended implementation of pay-for-performance for Medicare managed care plans and dialysis providers. The dialysis recommendation included the following principles that the Commission has since considered essential for all pay-for-performance programs:

- Measure performance with a comprehensive scope. (For example, for dialysis services, capture performance of both the physicians and the facilities that provide those services.)
- Use evidence-based and widely accepted quality measures that are readily available.
- Ensure that quality data collection and analysis is not unduly burdensome for providers or CMS.

- Select measures that most providers can improve on (i.e., ensure that measures are not "topped out," a situation where most providers already achieve high performance).
- For outcome measures such as mortality rates, select measures that can be risk adjusted to reflect each provider's particular case mix. Risk adjustment is essential to deter providers from avoiding patients who, because they are more clinically complex, might lower providers' quality scores.
- Reward providers for both attainment of scores exceeding an established benchmark and improvement over past performance.
- Fund quality improvement programs out of a small proportion of total provider payments.
- Redistribute to providers all of the funding that was set aside in accordance with their performance on the quality measures.

Building on these principles, in its March 2005 report, the Commission recommended pay-for-performance programs in FFS Medicare for inpatient hospitals, home health agencies, and physicians. The report also included an additional principle for pay-for-performance programs, which is that each program should include a formal process to continually evaluate and improve the quality measures used (Medicare Payment Advisory Commission 2005b).

Design of pay-for-performance programs for different provider types

In its June 2007 report, the Commission described the implementation details of a pay-for-performance system for different provider types, using the example of home health care (Medicare Payment Advisory Commission 2007). The report acknowledged that underlying problems in the home health payment system needed to be addressed concurrently with the implementation of a pay-for-performance policy. In its March 2008 report, the Commission recommended establishment of a pay-for-performance program for skilled nursing facilities (SNFs) that would tie payments to patient outcomes (Medicare Payment Advisory Commission 2008b). The Commission recommended using risk-adjusted rates of discharge to the community and potentially preventable rehospitalizations as initial measures, with other measures to be added over time.

In April 2008, the Commission commented on a CMS plan for implementing value-based performance (VBP) for inpatient hospital services (Medicare Payment Advisory Commission 2008a). We noted that the planned design of the program was largely consistent with the pay-for-performance principles and criteria recommended by the Commission in its 2004 and 2005 reports. The Commission supported the small initial set of measures for processes, mortality, and patient experience and suggested that the program should evolve as quickly as feasible to include patient safety outcome measures, such as rates of surgical site infections and central-line-associated bloodstream infections. We also suggested that a resource use measure be added to the program as quickly as possible, that a public process be used to add measures to the program that would explicitly consider how to synchronize Medicare's quality measurement requirements with those in the private sector, and that CMS determine a way to address statistical challenges in measuring quality for rural and other smaller providers by using composite measures and compiling data over several years.

How to compare quality between fee-for-service Medicare and Medicare Advantage

In its March 2010 report to the Congress, and in response to a directive in the Medicare Improvements for Patients and Providers Act of 2008, the Commission made a set of interconnected recommendations about how Medicare could compare quality between FFS Medicare and MA within defined geographic areas (Medicare Payment Advisory Commission 2010). The report acknowledged that in the short term it would be feasible to use only process measures to compare quality between the two payment models. The major limitation on calculating outcome measures such as mortality and potentially preventable admission and readmission rates for MA plans was (and continues to be) the lack of claims data from MA plans (known as encounter data). The report recommended that CMS move as quickly as feasible to gather the needed data and use a set of outcome measures—including population-level rates of potentially preventable hospital admissions for ambulatory care-sensitive conditions, potentially preventable visits (PPVs) to the emergency department (ED), and condition-specific mortality—to compare quality between FFS Medicare and MA. The Commission explicitly recommended that the Congress provide sufficient administrative funding to CMS to implement the report's recommendations.

The report also recommended revising the geographic unit for calculating and reporting MA quality to make the

geographic areas consistent with the Commission's June 2005 recommendation on reforming MA payment areas (Medicare Payment Advisory Commission 2005a). That recommendation stated that the Congress should establish payment areas for MA local plans that have the following characteristics: among counties in metropolitan statistical areas (MSAs), payment areas should be collections of counties in the same state and the same MSA, and among counties outside MSAs, payment areas should be collections of counties that are accurate reflections of local health care markets, such as health service areas defined by the National Center for Health Statistics.

Growing concern about the proliferation of process measures

In May 2011, the Commission commented on CMS's proposed regulations for the Medicare inpatient hospital VBP program authorized in the Patient Protection and Affordable Care Act of 2010 (Medicare Payment Advisory Commission 2011). Our letter noted that many of the proposed features of the program were consistent with the Commission's 2004 and 2005 pay-for-performance recommendations. However, we also raised concerns about the process measures that CMS proposed to use in the VBP program, noting that not only would the proposed measures impose costs on hospitals for the extraction of the needed data from medical charts, but, more significantly, there might be little or no gain in health outcomes in return for that expense. We cited the substantial body of published research that found little or no association between hospitals' performance on several of the clinical process measures Medicare proposed to use and hospitals' performance on the ostensibly related mortality or readmission rates for the same conditions (Bradley et al. 2006, Fonarow et al. 2007, Fonarow and Peterson 2009, Nicholas et al. 2010, Romley et al. 2011, Ryan et al. 2009, Werner and Bradlow 2006).

The Commission suggested that Medicare should give the most weight to a hospital's performance on outcome measures, such as the proposed 30-day mortality rate measure for selected conditions, in calculating each hospital's VBP total performance score. We also noted it might be necessary to use broader measures (e.g., an all-condition mortality rate) and assess hospital performance over longer performance periods (e.g., three to five years) to address "small numbers" concerns that can affect the statistical reliability of mortality rate measurements for individual hospitals. We underscored our preference for a limited number of outcomes-focused quality measures

Growth in fee-for-service Medicare's quality measurement programs

The Congress enacted the first program-wide, incentive-driven quality measurement reporting program in fee-for-service (FFS) Medicare—for inpatient hospitals—in the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA). Since then, quality reporting programs have been enacted for almost every provider type, and quality-based payment policies (often referred to as value-based purchasing (VBP) programs) have been enacted for every major provider type (Centers for Medicare & Medicaid Services 2014).

The case of quality reporting for inpatient and outpatient hospital care under FFS Medicare illustrates the growth in the complexity of quality measurement under FFS Medicare. When the Inpatient Quality Reporting (IQR) program was enacted in the MMA, the Congress mandated that hospitals paid under the inpatient prospective payment system (IPPS) report on 10 quality measures to receive a full IPPS market basket update in a subsequent year. Today, the IQR program includes almost 60 measures for the fiscal year 2016 IPPS market basket update (Telligen 2013). Table 3-1 shows the growth in the number of measures in the IQR since it was implemented.

**TABLE
3-1**

Number of measures in the Medicare Inpatient Quality Reporting program, by data source, 2005–2016

Payment update year (FY)	Total	Medical chart data	Medicare claims data	Patient survey (H-CAHPS®)	Structural
2005–2006	10	10	0	0	0
2007	21	21	0	0	0
2008	27	24	2	1	0
2009	30	26	3	1	0
2010	44	26	16	1	1
2011	45	27	14	1	3
2012	55	27	24	1	3
2013	57	29	24	1	3
2014	55	25	25	1	4
2015	59	42	12	1	4
2016	58	35	17	1	5

Note: FY (fiscal year), H-CAHPS® (Hospital Consumer Assessment of Healthcare Providers and Systems®). Examples of structural measures include reporting of participation in a systematic clinical database registry for specified conditions and safe surgery checklist use.

Source: Telligen 2013.

(continued next page)

in our March 2012 report to the Congress, in which we recommended that CMS use quality data from ambulatory surgical centers (ASCs) to implement a VBP program for ASCs that would reward high-performing providers and penalize low-performing providers (Medicare Payment Advisory Commission 2012d).

In 2012 and 2013 comment letters on CMS's proposed rules for the inpatient and outpatient hospital payment systems and the physician fee schedule, the Commission continued

to raise concerns about the directions in which quality measurement was going for those provider types in FFS Medicare (Medicare Payment Advisory Commission 2013a, Medicare Payment Advisory Commission 2012a, Medicare Payment Advisory Commission 2012c). The number of process measures in the inpatient and outpatient hospital quality reporting programs had grown rapidly since the programs' inceptions (see text box), and the Commission continued to point out that there was little evidence that

Growth in fee-for-service Medicare's quality measurement programs (cont.)

Hospitals also must participate in the Medicare Hospital Outpatient Quality Reporting (OQR) program to receive the full annual update to their outpatient prospective payment system rates. When Medicare implemented the OQR program in 2008, it

included 11 measures; today it includes 28 measures, 17 of which require hospitals to extract data from patient medical charts. Table 3-2 shows the growth in the number of measures in the OQR program since it began. ■

**TABLE
3-2**

Number of measures in the Medicare Outpatient Quality Reporting program, by data source, 2009–2016

Payment update year (CY)	Total	Medical chart data	Medicare claims data	Structural
2009	11	7	4	0
2010	11	7	4	0
2011	11	7	4	0
2012	12	7	4	1
2013	18	12	4	2
2014	24	14	7	3
2015	24	14	7	3
2016	28	17	7	4

Note: CY (calendar year). Examples of structural measures include reporting of influenza vaccination coverage among health care personnel and safe surgery checklist use.

Source: Florida Medical Quality Assurance Inc. 2014.

performance on these measures was correlated with outcomes such as mortality rates. We also noted other literature suggesting that using process measures rather than outcome measures creates an incentive for providers to focus clinical resources on ensuring good performance on the process measures while diverting resources from areas of care not being assessed (Bradley et al. 2012, Schwartz et al. 2011, Werner et al. 2008).

The Commission also commented in 2012 and 2013 on the physician value-based payment modifier that CMS is implementing under a statutory mandate (Medicare Payment Advisory Commission 2013b, Medicare Payment Advisory Commission 2012b). The value modifier will increase or decrease payments under the Medicare physician fee schedule, and it will be applied to physicians in groups of 100 or more eligible professionals (which includes physicians and other clinical professionals as defined by CMS) starting in 2015 and to all physicians starting in 2017. CMS is working to identify a sufficient number of quality measures (as of March 2014, the

agency's "measure inventory" listed 290 separate measures for the value modifier) so that each specialty has at least some applicable measures (Centers for Medicare & Medicaid Services 2014). The Commission has expressed concern that many of these measures will not address significant gaps in the quality of care for beneficiaries, either because they measure marginally effective care or because they reflect basic standards of care. In any case, by being built on top of the Medicare physician fee schedule, the value-based payment modifier itself will reinforce existing incentives in FFS reimbursement to increase the volume of services.

Concept for a new approach to quality measurement

The Commission is considering a new approach to measuring and reporting on the quality of care within and across the three main payment models in Medicare: FFS

**TABLE
3-3**

Population-based outcome measures for measuring quality in an area

Measure	Specifications	Existing examples
Potentially preventable admissions for inpatient hospital care	Potentially preventable admissions for beneficiaries diagnosed with ambulatory care-sensitive conditions (e.g., diabetes, CHF, COPD); may also include admissions for procedures subject to clinical appropriateness criteria (e.g., spinal fusion surgery) and admissions for short-term or long-term complications of chronic diseases	<ul style="list-style-type: none"> • 3M™ Potentially Preventable Admissions • AHRQ Prevention Quality Indicators
Potentially preventable ED visits	Potentially preventable ED visits for beneficiaries diagnosed with specified ambulatory care-sensitive conditions for the treatment of that condition; visits for conditions for which beneficiary could have been treated in a community (e.g., physician office) setting	<ul style="list-style-type: none"> • 3M Potentially Preventable Visits • Billings/New York University algorithm of potentially avoidable ED visits (Billings 2003)
Mortality rates after an inpatient hospital stay	Risk-adjusted 30-day postdischarge mortality rates for condition-specific (AMI, CHF, pneumonia, stroke, and COPD) and all-condition measures	<ul style="list-style-type: none"> • CMS/Yale 30-day risk-standardized mortality rates
Readmission rates after an inpatient hospital stay	Risk-adjusted 30-day postdischarge readmission rates for condition-specific (AMI, CHF, pneumonia, stroke, and COPD) and all-condition measures	<ul style="list-style-type: none"> • CMS/Yale 30-day risk-standardized readmission rates • 3M Potentially Preventable Readmissions
Healthy days at home	Number of days per year (expressed as a rate, such as per thousand) that beneficiaries met specified criteria for “healthy and at home,” such as days during which a beneficiary was not an inpatient, did not have an ED visit, and was alive	<ul style="list-style-type: none"> • Mortality/readmissions combined measure and variants under development by Commission staff
Patient experience	Results of standardized patient experience (CAHPS®) surveys, including CAHPS Item Set for Addressing Health Literacy to assess experience of patient-provider communication and shared decision making	<ul style="list-style-type: none"> • FFS CAHPS, MA CAHPS, Clinician & Group CAHPS for ACOs

Note: CHF (congestive heart failure), COPD (chronic obstructive pulmonary disease), AHRQ (Agency for Healthcare Research and Quality), ED (emergency department), AMI (acute myocardial infarction), CAHPS® (Consumer Assessment of Healthcare Providers and Systems®), FFS (fee-for-service), MA (Medicare Advantage), ACO (accountable care organization).

Medicare, MA, and ACOs. This quality measurement approach would deploy a small set of population-based outcome measures (such as potentially preventable hospital admissions, potentially preventable ED visits, and patient experience measures) to assess the quality of care in each of the three payment models within a local area.

We also are examining the feasibility of applying one type of measure of potentially inappropriate use of certain services—specifically, overuse measures—to measure quality in each payment model. Most of the quality measurement activity in the U.S. health care system to date has been focused on detecting underuse (“stinting”) of clinically appropriate services (Keyhani and Siu

2008, Korenstein et al. 2012). Overuse, however, is also a quality concern because of the potential for harm to beneficiaries—both directly from the tests and procedures performed on them and indirectly from unnecessary treatments for false-positive diagnoses and for clinically insignificant findings. Overuse also contributes to unnecessary program spending.

The Commission’s vision is that, over the next several years, Medicare will move away from publicly reporting on dozens of clinical process measures and toward reporting on a small set of population-based outcome measures for the beneficiary populations served by FFS Medicare, ACOs, and MA plans. For payment policy,

Medicare also could use the same population-based outcome measures to compare the quality of care in the ACOs and MA plans in a local area with the quality of FFS Medicare in the same area and to determine quality-based payment adjustments for the ACOs and MA plans. However, population-based outcome measures would not be appropriate for making payment adjustments under FFS Medicare, so Medicare would have to continue to use other, provider-based quality measures to make FFS payment adjustments—but in a much more focused and parsimonious way than it does today.

Reduce the size of current FFS quality programs

The Commission maintains that quality measurement in FFS Medicare currently relies on too many clinical process measures that do not appear to be related, at least in practice, to the outcome measures of most interest to policymakers and beneficiaries, such as mortality and readmission rates (Bradley et al. 2006, Fonarow et al. 2007, Fonarow and Peterson 2009, Nicholas et al. 2010, Romley et al. 2011, Ryan et al. 2009, Werner and Bradlow 2006). Further, the reliance on these measures may create an incentive for providers to focus clinical resources on ensuring good performance on the process measures, while diverting resources from important areas of care not being assessed (Bradley et al. 2012, Schwartz et al. 2011, Werner et al. 2008). The Commission acknowledges that Medicare has begun to give greater weight to outcome measures, for example, in the readmissions and hospital VBP programs. We encourage CMS not to add any new clinical process measures to the existing hospital Inpatient Quality Reporting and VBP programs and to remove process measures that are not found to have any association with their related outcome measures (e.g., process measures for acute myocardial infarction (AMI) patients that are found to have no association with outcomes for AMI patients).

Focus on population-based outcome measures

The Commission has considered using population-based outcome measures to assess the quality of care instead of relying on provider-based process measures as is current practice for FFS Medicare. Under this approach, Medicare would use a small set of population-based outcome measures to assess the quality of care provided under each of the program's three payment models—FFS Medicare, ACOs, and MA plans—within a local area. As much as possible, the areas (within which the populations of FFS

Medicare, ACOs, and MA plans would be measured) should be defined in a way that is consistent with the organization of local health care delivery markets and with Medicare payment policy, such as those that the Commission has recommended for local MA payment areas (Medicare Payment Advisory Commission 2005a). We also note that, even if Medicare were to use population-based outcome measures to evaluate and compare quality across FFS Medicare, ACOs, and MA plans in a local area, this effort would not preclude individual providers, medical groups, and health systems operating in each area from continuing to use other quality measures. The population-based outcome measures that the Commission has been considering are shown in Table 3-3.

As an initial study of the feasibility of calculating population-based outcome measures for Medicare, the Commission worked with a contractor to calculate rates for two of the quality measures listed in Table 3-3: potentially preventable admissions and potentially preventable visits to the ED (see text box, p. 50). The results of that initial analysis indicate that it is feasible to use FFS Medicare claims data to calculate rates of PPAs and PPVs. These rates could be used to set an FFS Medicare performance benchmark in each local area against which the PPA and PPV performance of the ACOs and MA plans in the area could be compared.

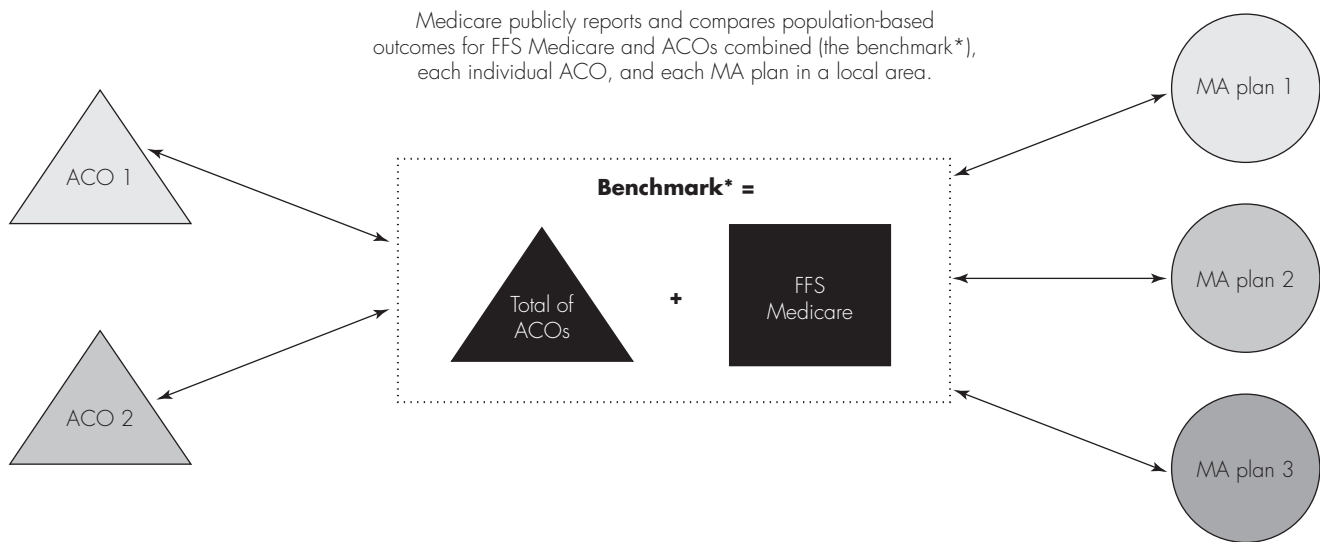
How population-based outcome measures could be applied to FFS Medicare, ACOs, and MA plans in a local area

Figure 3-1 (p. 48) depicts a simplified illustration of a local area in which all three Medicare payment models are active: FFS Medicare, two ACOs, and three MA plans. Under the Commission's concept for using population-based outcomes to measure quality, each measure described in Table 3-3 would be calculated for each entity in the local area. For example, if the local area looked like Figure 3-1, Medicare would calculate rates of potentially preventable admissions, potentially preventable ED visits, mortality, and other Table 3-3 measures for each of the three MA plans, the two ACOs, and FFS Medicare.

The Commission's vision for how Medicare would use population-based outcome measures to measure quality of care involves two distinct uses: public reporting

FIGURE 3-1

Conceptual diagram of quality reporting for Medicare payment models in a local area



Note: FFS (fee-for-service), ACO (accountable care organization), MA (Medicare Advantage).
*The benchmark shown here includes the combined results for all ACOs and FFS Medicare. Alternatively, the benchmark could be based on FFS Medicare only. See text for discussion.

(Figure 3-1) and payment policy (Figure 3-2a and Figure 3-2b). First, Medicare would publicly report the results of each measure described in Table 3-3 (p. 46) for each ACO and MA plan in the local area and would report a reference benchmark calculated by combining data for FFS Medicare and all of the ACOs in the area.¹ Anyone then would be able to compare quality between each ACO and MA plan and the benchmark (Figure 3-1).

Second, for payment purposes, the benchmark would be the threshold that the ACOs and MA plans in that area would have to exceed to qualify for any quality-based bonus payment (Figure 3-2a). In parallel fashion, Medicare could penalize ACOs and MA plans that performed below the benchmark in the area. The actual amount of any quality-based bonus payments to the ACOs and MA plans would be determined by comparing relative quality among the ACOs and, separately, among the MA plans (Figure 3-2b).

However, for reasons described in the next section, the Commission believes that making payment adjustments to FFS Medicare based on population-based outcome measures is not appropriate at this time. Instead, Medicare will need to keep measuring quality in FFS Medicare

using provider-based measures to make quality-based payment adjustments. Beneficiaries in FFS Medicare also will want provider-specific quality information to inform their choices about where to seek care. Unfortunately, provider-based quality measurement will continue to be subject, at least for the near future, to the technical shortcomings that the Commission has outlined over the past several years, including gaps in measures for some types of providers and the paradox that many of the clinical process measures currently available seem to be uncorrelated with high-priority clinical outcomes such as mortality.

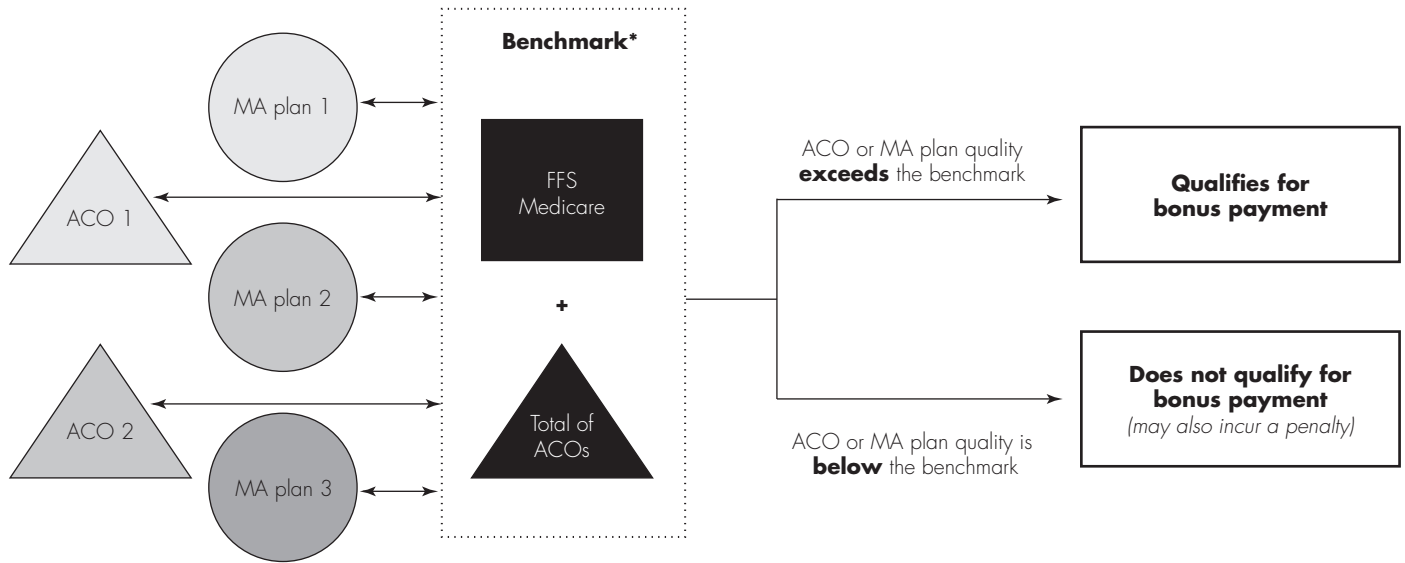
Concerns about using population-based outcome measures to make payment adjustments in FFS Medicare

Although population-based quality measures would have utility for public reporting on quality, the Commission believes that they are not appropriate for redistributing payments between FFS Medicare and the ACOs and MA plans in an area, nor across an area's FFS Medicare providers. Our primary concern is that, in FFS Medicare, there is no identifiable organization or agent to hold accountable for outcomes like PPAs, PPVs, and mortality rates. Under such an approach, the performance of all the

FIGURE 3-2

Conceptual diagram of quality-based payment for Medicare payment models in a local area

Figure 3-2a: Qualifying for quality-based bonus payment or penalty



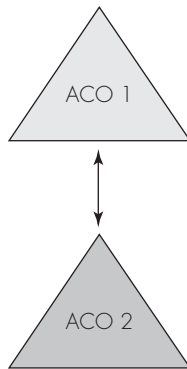
ACOs and MA plans in a local area are compared against a benchmark* calculated by combining data for FFS Medicare and all of the ACOs in the area

Figure 3-2b: Determining the value of quality-based bonus payment or penalty

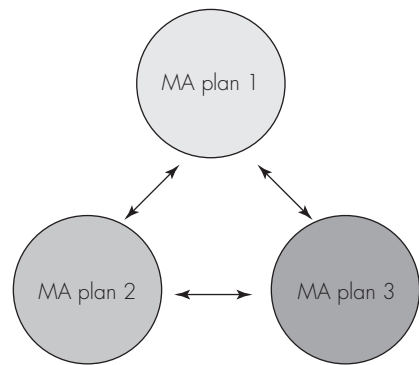
FFS Medicare

FFS Medicare uses **provider-based measures** to determine bonus level/penalties for FFS providers

- Measures not available for all provider types, so not all providers measured
- Each provider measured separately, if measures are available
- Provider bonus payments/penalties determined within each provider type



Each ACO that qualifies for a bonus (or penalty) is compared against other ACOs using **population-based measures** to determine bonus (or penalty) amount



Each MA plan that qualifies for a bonus (or penalty) is compared against other MA plans using **population-based measures** to determine bonus (or penalty) amount

Note: ACO (accountable care organization), MA (Medicare Advantage), FFS (fee-for-service).

*As shown here, the benchmark includes the combined performance of all ACOs and FFS Medicare. Alternatively, the benchmark could be based on FFS Medicare only. See text for discussion.

Measuring population-based outcomes: Potentially preventable admissions and potentially preventable emergency department visits

To explore the feasibility of calculating population-based outcome measures for fee-for-service (FFS) Medicare in local areas across the United States, the Commission contracted with 3MTM Health Information Systems to calculate rates for two of the outcome measures listed in Table 3-3 (p. 46): potentially preventable admissions (PPAs) to a hospital and potentially preventable visits (PPVs) to the emergency department (ED). While both measures use hospital utilization data, they are not hospital quality measures; rather, they are designed to assess the effectiveness of the ambulatory care delivery system within a geographic area. The premise underlying these measures is that, while not every potentially preventable event may be prevented, comparatively high rates of these potentially preventable events, when risk adjusted for variation and severity in the existing clinical conditions in the population, can identify opportunities for improvement in an area's ambulatory care systems. Other developers of quality measures have defined alternative approaches to measuring these potentially preventable events, and the Commission does not endorse any particular measurement technology. Details of the analyses are presented in online Appendix 3-A to this chapter, available at <http://www.medpac.gov>.

PPAs are hospital admissions that may be the result of inadequate ambulatory care. In these cases, patients required admission to a hospital for acute care services at the time they sought care, but the admission might have been avoided had they received appropriate ambulatory care and coordination activities. Similarly, PPVs are ED visits that reflect the effectiveness of the ambulatory care system in an area. PPVs also may reflect patient preferences for accessing care at an ED or the lack of other ambulatory care options in the community. Both PPAs and PPVs include patients with ambulatory care-sensitive conditions, such as diabetes

and asthma, for which appropriate patient monitoring, care coordination, and follow-up care (e.g., medication management) can reduce the use of much more costly hospital care.

Hospital stays can pose risks to patients, particularly the elderly. Adverse events represent a prominent risk, including iatrogenic infections, medication errors, device failures, and pressure injuries such as decubitus ulcers. According to researchers at the Centers for Disease Control and Prevention, health care-associated infections in hospitals are a significant cause of morbidity and mortality in the United States (Klevens et al. 2007). In addition, the inpatient environment itself can lead to a reduction in elderly patients' independence as they cope with functional loss that can stem from several factors, including extended bed rest.

Similarly, for several reasons, EDs are not the ideal venue for treatment of nonurgent acute conditions, management of chronic conditions, and primary care. First, care provided in EDs is more costly than care provided in ambulatory care settings for beneficiaries and taxpayers. Second, nonurgent utilization detracts from EDs' resources for providing emergency and lifesaving care (National Research Council 2007). Third, medical practitioners in the ED typically lack a relationship with the patient, are unfamiliar with the patient's baseline state, often lack complete medical records, and have little means of patient follow-up, all of which can reduce the efficacy of treatment. Overtreatment may pose another threat to the quality of ED care, particularly for nonurgent conditions. Because they are expected to make an accurate diagnosis and provide effective treatment based on a single visit, emergency physicians may err on the side of doing too much rather than too little (Moskop 2010). In addition to the high costs, diagnostic studies and invasive treatments may pose a risk of side effects and injury. ■

individual FFS providers in an area would be combined to determine the total performance score for FFS Medicare in that area. This process would combine the quality of both the high- and the low-performing providers in an area and thereby unfairly reward low performers and penalize high performers (Institute of Medicine 2013). Although holding

all FFS providers in an area accountable for population-based quality could eventually encourage high-performing providers to leave FFS Medicare and either join or form an ACO or contract with one or more MA plans in their area—a goal that the Commission supports—we believe that such an approach is not appropriate at this time.

Of course, it also is true that each provider participating in an ACO or contracting with an MA plan also contributes to the aggregate performance of that ACO or MA plan (to the extent they actually provide care to beneficiaries attributed to the ACO or enrolled in the MA plan). However, a critical difference between MA plans and FFS Medicare is that MA plans choose the providers for the networks they offer to beneficiaries. This capability allows MA plans to limit their provider networks to the providers they believe to be efficient (i.e., low cost and high quality). In effect, Medicare is holding the MA plan accountable for the combined performance of the contracted individual providers in its network. This capability to decide which providers to include and exclude from the plan's provider network is a critical distinction between FFS Medicare and MA plans.

ACOs occupy a middle ground between the other two payment models in that they can choose the providers who are members of the ACO, but they cannot restrict beneficiaries' choice of providers. Their quality performance, therefore, is the aggregate performance of all providers, whether they are ACO participants or not, that have cared for their attributed beneficiaries. In this instance, the ACO is the organizing entity that is held accountable and takes responsibility for the collective performance of its affiliated and nonaffiliated providers.

Concerns about using provider-based quality measures to make payment adjustments in FFS Medicare

Given the challenges of population-based measurement for FFS Medicare, provider-based quality measurement may continue to be necessary in FFS Medicare. But the Commission remains concerned that provider-based measurement has its own significant drawbacks, including the following:

- There are significant administrative costs for providers if Medicare uses quality measures that require providers to extract and transmit data from patients' medical charts. One possible solution would be to use measures that do not rely on data from medical charts, but the trade-off is a loss of clinical detail that may present a less-accurate assessment of a provider's performance. Also, as the Commission noted in its 2010 report to the Congress, the proliferation of electronic health records (EHRs) should eventually make it less costly to extract and use clinical detail from patient medical records for quality measures (Medicare Payment Advisory Commission 2010).

- For physicians and other health care professionals, it may be difficult to define clinically meaningful and statistically robust quality measures for some specialties (for example, certain surgical subspecialties and hospital-based specialties such as radiologists, pathologists, and anesthesiologists). Without such measures, the default assumptions about quality typically are that each provider's performance is sufficient and that quality does not vary across providers; such assumptions render moot a policy to redistribute some portion of payments on the basis of quality variations across providers. For the foreseeable future, it is likely that gaps will persist in Medicare's ability to measure quality for some physician specialties.² As long as this situation persists, it will create a policy question: Will some physicians be eligible for quality-based bonuses and penalties while others will not?
- Providers that do not treat a large number of Medicare beneficiaries may not have a sufficient number of cases to establish a reasonable degree of statistical reliability for the results. This "small numbers" problem can be a particular challenge when calculating outcome measures. As long as a provider does not have a sufficient number of Medicare patients to calculate statistically reliable quality measures, the default assumption typically is that the provider's performance is at the average of the distribution for all providers. One possible solution would be to focus on persistent statistical outliers; for example, CMS could identify providers whose performance is consistently in the worst performing decile of all providers. Potential concerns that the population of providers being evaluated is too heterogeneous (which could contribute to wider variation in performance) could be addressed by using groupings of providers that are based on shared characteristics among the providers (for example, physician specialty) and within a reasonably cohesive area, such as an MSA.
- Accurate risk adjustment for provider-based outcome measures, such as mortality rates, is essential. Without accurate risk adjustment, providers may be discouraged from treating clinically complex patients out of concern that caring for such patients will make providers' quality look worse due to factors that are beyond their control.

Measuring potentially inappropriate use of services: Overuse

In addition to population-based outcome measures, another area of quality that the Commission is exploring is the feasibility of measuring potentially inappropriate use of services, specifically overuse. While potentially inappropriate service use includes both underuse and overuse (Chan et al. 2013), most of the quality measurement activity in the U.S. health care system to date has been focused on detecting underuse (Keyhani and Siu 2008, Korenstein et al. 2012). Most of the measures in the Healthcare Effectiveness Data and Information Set[®], which is used by Medicare and many other payers to measure health plan quality, are specifically designed to assess underuse (Keyhani and Siu 2008). Overuse is more likely to occur in payment models such as fee-for-service (FFS) that create incentives to overprovide services with little or no benefit for patients, but evidence of overuse has been found in both FFS and managed care payment arrangements (Keyhani et al. 2013).

Because of the potential for harm to beneficiaries—both directly from the initial test or procedure and indirectly because an initial test may lead to further tests and procedures that may not be necessary—

and the wasteful program spending that results from overuse, the Commission conducted and contracted for two types of analyses to examine the feasibility of measuring overuse in FFS Medicare. The first analysis adapts three measures currently used by CMS for public reporting of imaging use in hospital outpatient departments and applies them to national FFS Medicare claims data. The purpose of these measures is to limit unnecessary exposure to radiation and contrast materials, improve adherence to evidence-based guidelines, reduce unnecessary spending by the Medicare program and beneficiaries, and ensure that patients get the right service the first time (National Quality Forum 2012). The second analysis examines rates of repeat testing among FFS Medicare beneficiaries, and the results were published in the *Archives of Internal Medicine* (now *JAMA Internal Medicine*) and the *Annals of Internal Medicine*. Commentaries accompanying the articles expressed the view that the repeat testing found represented “unjustified testing” or “overuse” (Kassirer and Milstein 2012, Shaheen 2014). The analyses are presented in detail in the online Appendix 3-B to this chapter, available at <http://www.medpac.gov>. ■

Issues for further Commission analysis

Although the Commission has described a vision for the evolution of quality measurement in Medicare, there are several complex and interrelated issues that the Commission will continue to analyze over the coming year. The Commission also plans to continue to explore overuse measurement as another way to improve quality, because of the potential for harm to beneficiaries and wasteful program spending that result from overuse (see text box).

Defining the population for provider-based quality measurement in FFS Medicare

An important technical issue to be resolved is whether the population for FFS Medicare provider-based quality measures should include only FFS Medicare beneficiaries or include all Medicare beneficiaries who are treated by the provider, that is, also include beneficiaries who are attributed to an ACO or enrolled in an MA plan in the

local area. It may be argued that only FFS beneficiaries should be included in the provider-based measures because the ACO or MA plan should be held accountable for the quality of care received by their attributed or enrolled beneficiaries. However, it also may be argued that the outcomes of treatment by a provider are ultimately the responsibility of that provider, regardless of whether the beneficiary is attributed to an ACO, enrolled in an MA plan, or covered under FFS Medicare. Further, restricting the measurement population to only the FFS Medicare beneficiaries treated by a provider would exacerbate the statistical small numbers problem, meaning that the resulting rates would be a less reliable basis for making payment adjustments.

Redistributing funding between ACOs and MA plans by directly comparing quality of ACOs and MA plans

The Commission has discussed the possibility of comparing the performance of ACOs and MA plans

in terms of population-based outcomes to redistribute funding between the ACOs and MA plans in an area, but this idea requires further development. ACOs are relatively new to Medicare, and it is likely that it will take time for them to begin affecting the quality and cost of care for their attributed beneficiaries (and there also is the possibility that ACOs may not be successful in accomplishing this kind of quality improvement). Therefore, it may not be appropriate yet to compare performance on population-based outcomes between the ACOs and MA plans in a local area, unless and until ACOs have become an established Medicare payment model.

Adjusting payments for geographic variation in quality of care across local areas

Quality varies widely across geographic areas in the United States. An ACO or MA plan in one area of the country may perform well relative to FFS Medicare in that area, but its performance may be poor relative to the average performance of ACOs, MA plans, or FFS Medicare in other areas. The Commission will continue to examine the issue of whether Medicare should compare and make payment adjustments on the basis of quality comparisons across geographic areas.

Identifying the funding source for quality-based payments

Assuming funding for quality-based bonuses and penalties would come from current program spending, quality-based payments could be funded by redistributing a percentage of base payments across FFS Medicare, ACOs, and MA plans, or alternatively by redistributing a percentage of base payments within each payment model separately. We also acknowledge that new funding for a bonus-only program, for example, could come from new revenue or non-Medicare funding offsets, but these options are beyond the purview of the Commission.

Transitioning from Medicare's current quality measurement programs

The Commission assumes that the transition to a quality measurement system using population-based outcome measures would take several years. Some of these steps include:

- having independent third parties—rather than provider groups themselves—develop the provider-based measures that would be used in FFS Medicare;

other key stakeholders also could be included in the measure development and approval process, such as representatives of beneficiaries (as consumers of care) and private payers (to increase the synchronization of quality measurement between Medicare and private payers);

- reducing the number of measures used by FFS Medicare for each type of provider and exercising restraint when adding any new measures;
- retiring clinical process measures when research finds they have no association with performance on provider-based outcome measures;
- developing outcome measures, including risk-adjustment methods, that take advantage of the more complete and more easily accessible clinical detail in EHRs; and
- focusing provider-based quality measurement on outcome measures.

Conclusion

The Commission believes it may be desirable and feasible to transition Medicare over the next decade to a quality measurement system that uses a small number of population-based outcome measures to evaluate, compare, and publicly report on quality within a local area across Medicare's three payment models—FFS Medicare, MA, and ACOs. The same population-based measures also could be used to make payment adjustments within or across the MA and ACO models, but would not be appropriate for adjusting FFS Medicare payments in an area because FFS providers have not explicitly agreed to be responsible for a population of beneficiaries. Therefore, at least for the foreseeable future, FFS Medicare will need to continue to rely on provider-based quality measures to make payment adjustments. While current technology to measure provider-based quality may not be sufficiently developed to support payment adjustments, especially with respect to physician services, there are steps that Medicare can take in the short term to improve its provider-based quality measurement programs. ■

Endnotes

- 1 Defining the benchmark in this way may be necessary to create an ongoing incentive for the ACOs and MA plans in a local area to continue quality improvement over time. If the benchmark were defined to include only beneficiaries in traditional FFS Medicare—which may become smaller and less representative of the local market over time, as ACOs and MA plans continue to grow—the resulting “FFS-only” benchmark could be an increasingly unrepresentative and unreasonable standard against which to evaluate the relative quality of the area’s ACOs and MA plans.
- 2 Some stakeholders have suggested that medical societies could be a source of new physician quality measures, but this process could create an incentive for the developers of such measures to design them to be relatively easy to perform well on.

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CHAPTER 4

**Financial assistance
for low-income
Medicare beneficiaries**

Financial assistance for low-income Medicare beneficiaries

Chapter summary

Medicare Savings Programs (MSPs) provide financial assistance with the Medicare Part B premium for beneficiaries with incomes up to 135 percent of the federal poverty level. Medicare's Part D prescription drug benefit, when implemented in 2006, incorporated a new subsidy structure that provided assistance to beneficiaries with incomes up to 150 percent of the federal poverty level. In 2008, the Commission recommended that the Congress align the MSP income eligibility criteria with the Part D low-income drug subsidy (LIS) criteria, effectively extending the Part B premium subsidy to beneficiaries with incomes up to 150 percent of the federal poverty level.

The Commission's 2012 recommendation on the redesign of the fee-for-service (FFS) benefit package balances two main goals: to give beneficiaries better protection against high out-of-pocket (OOP) spending and, at the same time, create financial incentives for them to make better decisions about their use of discretionary care by maintaining cost sharing (deductibles, copayments, or coinsurance) at the "point of sale." Even with the improved FFS benefit, Medicare beneficiaries with limited incomes could still have difficulty paying their OOP costs. The Commission's 2008 recommendation, which would effectively increase the MSP income eligibility criteria to 150 percent of the federal poverty level, would provide additional financial assistance to lower income beneficiaries by fully subsidizing their Part B

In this chapter

- Current programs for low-income beneficiaries under Medicare
- Examples of state variation in MSP eligibility
- Targeting assistance for low-income beneficiaries through the MSPs
- Rationale for the Commission's 2008 recommendation
- Relationship between the 2008 and 2012 recommendations

premium while still maintaining desirable incentives at the point at which services are provided.

This chapter explains the rationale behind the Commission's 2008 recommendation related to MSPs, provides examples of variation in MSP eligibility across states, describes why premium assistance for low-income beneficiaries through MSPs permits a targeted and efficient approach to help low-income beneficiaries, and explains how the 2008 recommendation addresses more recent concerns about the affordability of low-income beneficiaries' Medicare OOP costs under the redesigned FFS benefit. ■

**TABLE
4-1**

Previous Commission recommendations on the Medicare Savings Programs and the reformed FFS benefit design

Topic	Recommendation	Report to the Congress
Medicare Savings Programs	<ul style="list-style-type: none"> • The Secretary should increase State Health Insurance Assistance Program funding for outreach to low-income Medicare beneficiaries. • The Congress should raise Medicare Savings Program income and asset criteria to conform to low-income drug subsidy criteria. • The Congress should change program requirements so that the Social Security Administration screens low-income drug subsidy applicants for federal Medicare Savings Program eligibility and enrolls them if they qualify. 	March 2008
FFS benefit design	<p>The Congress should direct the Secretary to develop and implement a fee-for-service benefit design that would replace the current design and would include:</p> <ul style="list-style-type: none"> • an out-of-pocket maximum; • deductible(s) for Part A and Part B services; • replacing coinsurance with copayments that may vary by type of service and provider; • secretarial authority to alter or eliminate cost sharing based on the evidence of the value of services, including cost sharing after the beneficiary has reached the out-of-pocket maximum; • no change in beneficiaries’ aggregate cost-sharing liability; and • an additional charge on supplemental insurance. 	June 2012

Note: FFS (fee-for-service).

Source: Medicare Payment Advisory Commission 2012. Medicare Payment Advisory Commission 2008.

Introduction

Medicare Savings Programs (MSPs) provide financial assistance with Medicare out-of-pocket (OOP) costs for beneficiaries with incomes up to 135 percent of the federal poverty level. The extent of the financial assistance available through MSPs varies based on income. In 2014, the federal poverty level is set at an annual income of \$11,670 for an individual and \$15,730 for a couple (Office of the Assistant Secretary for Planning and Evaluation 2014).¹ In 2014, 135 percent of the federal poverty level corresponds to an annual income of \$15,755 for an individual and \$21,236 for a couple. Beneficiaries with incomes up to 100 percent of the federal poverty level are eligible for financial assistance with their Part A and Part B premiums, deductibles, copayments, and coinsurance through one of the MSPs, the Qualified Medicare Beneficiary (QMB) program. Beneficiaries with incomes above 100 percent and up to 135 percent of the federal poverty level are eligible for assistance with their Part B premium through the other MSPs. In 2008, the Commission recommended that the Congress

align the MSP income eligibility criteria with the Part D low-income drug subsidy (LIS) criteria established in 2006, which is 150 percent of the federal poverty level (Table 4-1).² If this recommendation were implemented, beneficiaries with incomes up to 150 percent of the federal poverty level would receive financial assistance with their Part B premium. In 2014, the annual Part B premium is almost \$1,300.

The Commission’s 2008 recommendation to conform the MSP and LIS income eligibility criteria was based on analyses of low-income beneficiaries’ OOP spending. The Commission found that, in general, Medicare beneficiaries age 65 and older were more likely to be low income than non-Medicare beneficiaries under age 65; Medicare beneficiaries spent a larger percentage of their income on OOP health costs than non-Medicare beneficiaries under age 65; and beneficiaries eligible for, but not enrolled in, MSPs were more likely than those enrolled in MSPs to report avoiding needed health care because of cost.

In 2012, the Commission recommended a redesigned fee-for-service (FFS) benefit package (Table 4-1). The current FFS benefit design includes a relatively high deductible for

**TABLE
4-2**

Medicare premium and cost-sharing assistance by beneficiary income

	Income			
	Up to 100% FPL	100–120% FPL	120–135% FPL	135–150% FPL*
Medicare Part A and Part B				
MSP category	QMB	SLMB	QI	Not covered
Part A premium	X			
Part B premium	X	X	X	
Deductibles (Part A and Part B)	X			
Coinsurance (Part A and Part B)	X			
Medicare Part D LIS				
Part D premium or deductible	X	X	X	X**
Reduced copayment	X	X	X	X

Note: FPL (federal poverty level), MSP (Medicare Savings Program), QMB (qualified Medicare beneficiary), SLMB (specified low-income Medicare beneficiary), QI (qualifying individual), LIS (low-income drug subsidy). There are also asset criteria for MSPs and the LIS program. Since 2008, the listed MSPs and the LIS have used the same asset limits. Most Medicare beneficiaries do not pay the Part A premium because they have worked at least 40 quarters and paid Medicare taxes while working. The table excludes the MSP category of qualified disabled working individuals and other full-benefit dual-eligible beneficiaries who are not part of the MSP program.

* Some Medicare beneficiaries—including those who have incomes within the 135 percent to 150 percent of the federal poverty level range—can meet their state’s eligibility for Medicaid benefits. These beneficiaries are not enrolled in the MSPs, however, because they do not meet the MSP income and/or asset eligibility criteria. States may—but are not statutorily obligated to—cover Medicare cost sharing for these beneficiaries.

** These beneficiaries receive a partial Part D premium subsidy based on a sliding scale and a reduced deductible.

Source: Centers for Medicare & Medicaid Services 2013a; Centers for Medicare & Medicaid Services 2013b; Medicare Payment Advisory Commission 2008.

inpatient stays, a relatively low deductible for physician and outpatient care, and a coinsurance requirement of 20 percent of allowable charges for most physician care and outpatient services (see online Appendix 4-A, available at <http://www.medpac.gov>). Under this benefit, no upper limit exists on the amount of Medicare cost-sharing expenses a beneficiary can incur. Without additional coverage, the FFS benefit design exposes Medicare beneficiaries to substantial financial risk.

The Commission’s 2012 recommendation on the redesign of the FFS benefit package balances two main goals: to give beneficiaries better protection against high OOP spending and, at the same time, create incentives for them to make better decisions about their use of discretionary care. There is inherent tension between these two goals. If the benefit design provides too much financial protection, then beneficiaries might not have appropriate incentives to make cost-conscious choices and reduce the use of lower value services. However, if cost sharing is too high, beneficiaries might reduce their use of care indiscriminately, not necessarily based on whether the service is appropriate or essential, and would remain unprotected from the risk of very high and unpredictable medical expenses. The Commission’s recommendation protects beneficiaries by adding an OOP

spending maximum and creates clearer incentives for beneficiaries to make better decisions about their use of care by replacing coinsurance with copayments (Medicare Payment Advisory Commission 2012).

Even under an improved benefit, however, Medicare beneficiaries with limited incomes could have difficulty paying their OOP costs. The Commission’s 2008 recommendation to align the MSP and LIS income eligibility criteria addresses some of this concern. Alleviating the expense of the Part B premium for beneficiaries with incomes between 135 percent and 150 percent of the federal poverty level would enable low-income beneficiaries to use these funds to pay the remainder of their Medicare OOP costs.

Current programs for low-income beneficiaries under Medicare

The Congress created MSPs and the Part D LIS program to help low-income beneficiaries pay for their OOP expenses related to Medicare-covered services. Eligibility for MSPs and the LIS is based on income and asset criteria. There are multiple MSP categories that provide assistance with some

or most of a beneficiary's Part A and Part B premiums and cost sharing, depending on the beneficiary's income. All beneficiaries enrolled in MSPs are considered dual-eligible beneficiaries. As explained in more detail below, some MSP enrollees (referred to as partial-benefit dual-eligible beneficiaries) are eligible only for premium assistance and, in some cases, cost-sharing assistance through MSPs. Other MSP enrollees (referred to as full-benefit dual-eligible beneficiaries) are eligible for full Medicaid benefits in addition to cost-sharing assistance through MSPs. For the LIS, the level of assistance varies by the beneficiary's income and dual-eligible status.

Levels of financial assistance under MSPs and the LIS

Low-income beneficiaries receive varying levels of assistance based on their income. There are four income categories: up to 100 percent of the federal poverty level, 100 percent to 120 percent of the federal poverty level, 120 percent to 135 percent of the federal poverty level, and 135 percent to 150 percent of the federal poverty level. The first three income categories correspond to the following MSP categories: qualified Medicare beneficiaries (QMBs), specified low-income Medicare beneficiaries (SLMBs), and qualifying individuals (QIs).³ The asset eligibility limit is the same for each of these three MSP categories. To qualify for MSPs in 2014, beneficiaries must have assets that are less than or equal to \$7,160 for an individual or \$10,750 for a couple. Table 4-2 summarizes the levels of assistance available for various MSP and LIS beneficiary groups.

- Up to 100 percent of the federal poverty level:** Beneficiaries with incomes up to 100 percent of the federal poverty level are eligible for assistance with Part A and Part B premiums and cost sharing through the QMB program. Of all the MSP categories, the QMB program offers the most generous benefits. QMBs are eligible for assistance with Medicare Part A and Part B premiums, deductibles, and coinsurance. Most beneficiaries with incomes up to 100 percent of the federal poverty level also qualify for full Medicaid benefits within their state, such as Medicare wrap-around services and long-term care services and supports. These beneficiaries are full-benefit dual-eligible beneficiaries and are referred to as QMB-plus. QMB-only beneficiaries, who are partial-benefit dual-eligible beneficiaries, do not meet their state's criteria for full Medicaid benefits and are eligible only for assistance with Medicare OOP costs. QMBs are the largest MSP category. In 2011, about

TABLE 4-3

All Medicare beneficiaries (FFS and Medicare Advantage) enrolled in the MSPs, 2011

MSP category	Number of beneficiaries (in millions)	Percent of all Medicare beneficiaries
QMB	6.0	12%
SLMB	1.1	2
QI	0.5	1

Note: FFS (fee-for-service), MSP (Medicare Savings Program), QMB (qualified Medicare beneficiary), SLMB (specified low-income Medicare beneficiary), QI (qualifying individual). Table includes beneficiaries enrolled in both FFS and Medicare Advantage.

Source: MedPAC analysis of 2011 Common Medicare Environment data.

6 million beneficiaries—12 percent of all Medicare beneficiaries—were enrolled in the QMB program (Table 4-3). Under the Part D LIS, beneficiaries with incomes up to 100 percent of the federal poverty level pay a nominal copayment (in 2014, \$1.20 for generic drugs, \$3.60 for brand-name drugs), but do not pay a Part D premium or deductible.

- Between 100 percent and 120 percent of the federal poverty level:** Beneficiaries with incomes between 100 and 120 percent of the federal poverty level are eligible for payment of their Part B premium under the SLMB program. Some beneficiaries in this income category also qualify for full Medicaid benefits within their state. They are referred to as SLMB-plus and are full-benefit dual-eligible beneficiaries. SLMB-only beneficiaries are partial-benefit dual-eligible beneficiaries because they are eligible for payment of their Part B premium but are not eligible for full Medicaid benefits. The SLMB program is the second largest MSP category; in 2011, slightly more than one million beneficiaries (2 percent of all Medicare beneficiaries) were SLMBs (Table 4-3). Beneficiaries in this income category are also eligible for the LIS program. They pay a reduced copayment for their Part D drugs (in 2014, \$2.55 for generic drugs, \$6.35 for brand-name drugs), but do not pay a Part D premium or deductible.
- Between 120 percent and 135 percent of the federal poverty level:** Beneficiaries with incomes between 120 percent and 135 percent of the federal poverty level are eligible for the QI program. Similar to the SLMB program, QIs are eligible only for payment of their Part B premium. Enrollment in the QI program is lower than enrollment in the QMB and

**TABLE
4-4**

FFS Medicare program spending and beneficiary cost-sharing liabilities by MSP category, 2011

MSP category	Percent of FFS beneficiaries*	Average FFS Medicare program spending	Average FFS Medicare cost-sharing liability
QMB-only	2.5%	\$11,140	\$1,920
QMB-plus	11.7	13,400	2,220
SLMB-only	1.6	10,540	1,780
SLMB-plus	0.6	19,920	3,400
QI	0.8	11,170	1,890
Non-MSP, non-dual	78.8	8,240	1,470

Note: FFS (fee-for-service), MSP (Medicare Savings Program), QMB (qualified Medicare beneficiary), SLMB (specified low-income Medicare beneficiary), QI (qualifying individual). MSP categories are based on beneficiaries' status as of July 2011. Program spending and cost-sharing liability numbers are rounded to nearest \$10. Beneficiaries enrolled in Medicare Advantage plans are excluded.

* The percentage of beneficiaries does not sum to 100 because the analysis excludes beneficiaries who were not enrolled in Medicare in July 2011 and "other full-benefit dual-eligible beneficiaries." Individuals in the latter group are eligible for full Medicaid benefits but are not enrolled in the MSPs because they do not meet the MSP income and/or asset eligibility criteria. These beneficiaries often reside in long-term care facilities.

Source: MedPAC analysis of 2011 Common Medicare Environment data.

SLMB programs. Currently, the QI program is authorized through March 31, 2015. In 2011, close to 500,000 beneficiaries—1 percent of all Medicare beneficiaries—were enrolled in the QI program (Table 4-3, p. 63). In the LIS program, beneficiaries in this income category pay a reduced copayment for their Part D drugs (in 2014, \$2.55 for generic drugs, \$6.35 for brand-name drugs), but do not pay a Part D premium or deductible.

- **Between 135 percent and 150 percent of the federal poverty level:** Beneficiaries with incomes between 135 percent and 150 percent of the federal poverty level are not eligible for MSPs. They are, however, still eligible for the Part D LIS. These beneficiaries get a partial Part D premium subsidy based on a sliding scale, a reduced deductible (\$63.00 in 2014), reduced coinsurance up to the OOP threshold (the lower of the 15 percent coinsurance or the plan copay), and reduced copayments after the OOP threshold (in 2014, \$2.55 for generic drugs, \$6.35 for brand-name drugs).

Medicare spending on beneficiaries enrolled in MSPs

FFS beneficiaries enrolled in MSPs tend to have higher Medicare program expenditures than non-MSP, non-dually eligible beneficiaries. Table 4-4 summarizes average program spending and beneficiary cost-sharing liability of beneficiaries who were enrolled in only FFS (i.e., enrolled in both Medicare Part A and Part B and not enrolled in Medicare Advantage) in 2011. Their MSP category was based on their status as of July 2011.

In 2011, Medicare per capita FFS spending was higher for MSP beneficiaries than for non-MSP, non-dual-eligible beneficiaries (Table 4-4). Average per capita FFS spending on beneficiaries enrolled in MSPs ranged from a low of \$10,540 (for SLMB-only beneficiaries) to a high of \$19,920 (for SLMB-plus beneficiaries). SLMB-plus beneficiaries may have such high Medicare FFS spending because, in order to qualify for the SLMB-plus program, individuals must incur OOP expenses that reduce their income to Medicaid eligibility levels. It is likely that these individuals also had high Medicare expenditures while incurring high OOP expenses. In comparison with MSP beneficiaries, Medicare FFS average per capita spending was \$8,240 for non-MSP, non-dual-eligible beneficiaries. Within QMB and SLMB categories, full-benefit dual-eligible beneficiaries (the QMB-plus and SLMB-plus) had higher spending than partial-benefit dual-eligible beneficiaries (the QMB-only and SLMB-only). The numbers shown in Table 4-4 are unadjusted and reflect differences in beneficiary characteristics across MSP categories. For example, compared with non-dual-eligible beneficiaries, more dual-eligible beneficiaries report being in poor health and having more limitations in activities of daily living (Medicare Payment Advisory Commission and the Medicaid and CHIP Payment and Access Commission 2013).

Financing of MSPs and state payment of Medicare cost sharing

The MSP categories are either jointly funded by the federal government and states or fully financed by the federal government. The QI program is fully financed by the

**TABLE
4-5**

Examples of state variation in MSP income and asset limits, 2014

Medicare beneficiary	Annual income	Income as a percent of FPL	Assets	MSP status if the beneficiary lives in:		
				Alabama	Connecticut	Oregon
Individual A	\$21,006	180%	\$7,000	Does not qualify for any MSPs	Qualifies for the QMB program	Does not qualify for any MSPs
Individual B	\$12,837	110	\$10,000	Qualifies for the SLMB program	Qualifies for the QMB program	Does not qualify for any MSPs

Note: MSP (Medicare Savings Program), FPL (federal poverty level), QMB (qualified Medicare beneficiary), SLMB (specified low-income Medicare beneficiary). Examples are hypothetical. The 2014 federal poverty level is \$11,670 for an individual. The 2014 MSP asset limit for QMBs and SLMBs is \$7,160 for an individual.

Source: Data for state MSP income and asset thresholds are from Alabama Medicaid Agency 2014, Connecticut Department of Social Services 2013, and Oregon Department of Human Services 2012.

federal government; federal funds are appropriated for the QI program and given through block grants to states to administer the program. In contrast, cost-sharing payments made under the QMB and SLMB programs are jointly financed by states and the federal government. States receive a match through the federal medical assistance percentage for any Medicaid funds they use to pay the QMBs' and SLMBs' Medicare premium and cost-sharing obligations.

States vary as to whether they pay the full cost-sharing obligation for beneficiaries enrolled in MSPs. States must pay the Part B premium on behalf of QI and SLMB enrollees, and they must pay the Part A and Part B premiums on behalf of QMB enrollees. However, states are not obligated to pay QMB enrollees' full Medicare cost-sharing liabilities, and most states do not (Medicaid and CHIP Payment and Access Commission 2013, Medicare Payment Advisory Commission 2008).⁴ According to the Balanced Budget Act of 1997, a state does not have to pay any of a QMB enrollee's cost-sharing liability if the amount the Medicare program paid to the provider is greater than the state's Medicaid payment rate for that same service. The combined amount that a provider receives from Medicare and any amount received from Medicaid is considered payment in full on behalf of the QMB, and providers are not permitted to bill beneficiaries for any remaining cost sharing.

Examples of state variation in MSP eligibility

Which beneficiaries qualify for MSPs varies across states. The income and asset eligibility levels for MSPs are

statutorily defined. However, states may apply income disregards or eliminate the MSP asset tests; doing so enables beneficiaries with incomes and assets that exceed the MSP statutory eligibility criteria to qualify for MSPs in those states.

With respect to income disregards, by federal law, \$20 of monthly income is disregarded when determining MSP income eligibility (Congressional Research Service 2013). States, though, may apply additional income disregards. For example, Connecticut, the District of Columbia, and Maine apply additional income disregards that effectively raise the QMB program income threshold from the federal limit of 100 percent of the federal poverty level to 140 percent of the federal poverty level in Maine, 200 percent of the federal poverty level in Connecticut, and 300 percent of the federal poverty level in the District of Columbia (Connecticut Department of Social Services 2013, Consumers for Affordable Health Care and Maine Equal Justice Partners 2013, Government of the District of Columbia 2013). There are federal asset limits for MSPs. Resources that count toward the asset limit include checking and savings accounts, stocks, bonds, mutual funds, and individual retirement accounts (Congressional Research Service 2013). However, eight states—Alabama, Arizona, Connecticut, Delaware, Maine, Mississippi, New York, and Vermont—do not apply asset limits for eligibility for MSPs (Medicare Rights Center 2014). Therefore, beneficiaries residing in these states could qualify for MSPs even if they had assets that exceed the federal limit.

Table 4-5 presents illustrative (and hypothetical) examples of how state variation in income disregards and asset limits can result in Medicare beneficiaries qualifying for

MSPs in some states but not in others. In the first example, Individual A is a female Medicare beneficiary with an annual income of 180 percent of the federal poverty level and \$7,000 in assets. According to federal eligibility limits, she does not qualify for any MSPs because her income exceeds 135 percent of the federal poverty level. If she lived in either Alabama or Oregon, she would not qualify for MSPs because income eligibility for MSPs in those states is consistent with the federal income eligibility limits. However, she would qualify for the QMB program in Connecticut because that state applies income disregards that effectively raise the QMB income eligibility to 200 percent of the federal poverty level.

In the second example, Individual B is a male Medicare beneficiary with an income of 110 percent of the federal poverty level and assets of \$10,000. Individual B's income meets the federal eligibility limits for the SLMB program, but his assets exceed the federal eligibility limits for any MSPs (\$7,160 in 2014). Therefore, according to federal eligibility limits, he does not qualify for MSPs. If he lived in Oregon, he would not qualify for MSPs because the Oregon MSP income and asset eligibility criteria are consistent with federal eligibility limits. If he lived in Alabama, he would qualify for the SLMB program based on his income alone because Alabama does not apply asset limits to MSPs. If he lived in Connecticut, he would be eligible for the QMB program because Connecticut does not apply asset limits to MSPs and applies income disregards to the QMB program that effectively increase QMB income eligibility to 200 percent of the federal poverty level.

Moreover, beneficiaries enrolled in MSPs who qualify for full Medicaid benefits in one state may qualify only for cost-sharing assistance in another state because income eligibility for full Medicaid benefits varies across states.⁵ Income eligibility limits, as a percent of the federal poverty level, for full Medicaid benefits range from a high of 133 percent in Massachusetts (for persons with disabilities) to a low of 61 percent in Ohio (for persons age 65 or older as well as those with disabilities). Most states apply a limit of 100 percent for all populations (Medicaid and CHIP Payment and Access Commission 2014). In addition, individuals with higher incomes may be eligible for Medicaid if they have high medical expenses (as described in the next paragraph) or if they require long-term care. As a result, a Medicare beneficiary with an income of 100 percent of the federal poverty level (\$11,670 in 2014) who lived in Vermont would qualify for the QMB-plus program and would be eligible to receive

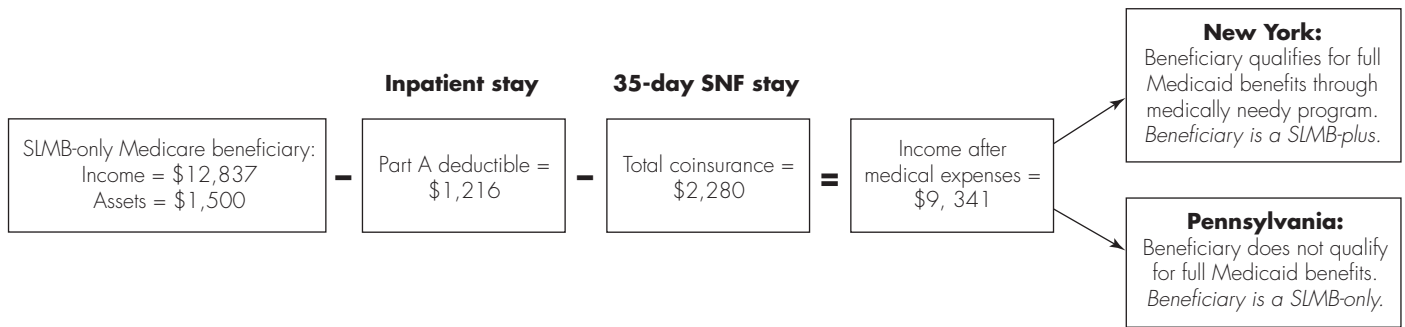
full Medicaid benefits in addition to Medicare cost-sharing assistance. However, if this same person lived in Ohio, he or she would qualify for the QMB-only program because this beneficiary's income exceeds Ohio's Medicaid threshold of 61 percent of the federal poverty level. In Ohio, this beneficiary would be eligible for assistance with Medicare premiums and cost sharing, but would not be eligible for full Medicaid benefits.

Medicare beneficiaries—including MSP enrollees and those with incomes higher than federal MSP income thresholds—can become eligible for full Medicaid benefits through the medically needy, or “spend-down,” program. Most states have a medically needy program, but income eligibility limits vary across states (Medicaid and CHIP Payment and Access Commission 2014). Individuals can qualify for Medicaid through the medically needy program if they are categorically eligible for Medicaid (e.g., the aged, blind, and disabled) and have medical expenses that—after deducted from their income—reduce their income to meet their state's medically needy income limits. Individuals are eligible for Medicaid through spend-down on a month-by-month basis, though eligibility can also be determined for a longer period of up to six months. However, because medically needy income limits vary across states, the same person could spend down to qualify for full Medicaid benefits in one state but not qualify for the medically needy program in another state.

The following is a hypothetical example of how beneficiaries can spend down their incomes to be eligible for medically needy programs in some states but not others, using the states of New York and Pennsylvania for illustrative purposes (Figure 4-1). Assume that in 2014, an aged male Medicare beneficiary has an annual income of \$12,837, or 110 percent of the federal poverty level, and assets of \$1,500. Also assume that he does not have any other medical or supplemental insurance. Because this beneficiary's income is between 100 percent and 120 percent of the federal poverty level, he qualifies for payment of his Part B premium through the SLMB program. However, because his income exceeds 100 percent of the federal poverty level, he does not qualify for full Medicaid benefits, even though he is aged (i.e., categorically eligible at age 65 or older). After an acute inpatient hospital stay, this beneficiary pays the Part A deductible of \$1,216. He is then admitted to a skilled nursing facility (SNF) for 35 days and—per Medicare policy—pays a coinsurance of \$152/day for the 21st day through the 35th day of his SNF stay. After the inpatient and SNF stays, this beneficiary's out-of-pocket medical expenses amount to \$3,496. After deducting

FIGURE 4-1

Example of spend-down and state variation in the medically needy program, 2014



Note: SLMB (specified low-income Medicare beneficiary), SNF (skilled nursing facility). Example is hypothetical. The 2014 federal poverty level is \$11,670 for an individual. The 2014 SLMB asset limit is \$7,160 for an individual. The 2014 SNF coinsurance is \$152 per day after the first 20 days. Eligibility for the medically needy program is 83 percent of the federal poverty level in New York and 44 percent of the federal poverty level in Pennsylvania.

these medical expenses, his income is \$9,341, or about 80 percent of the federal poverty level.⁶ If this beneficiary lived in New York, he would qualify for full Medicaid benefits (SLMB-plus) through the medically needy program because New York’s income limit for that program is 83 percent of the federal poverty level (an income of about \$9,686).⁷ But if this same beneficiary lived in Pennsylvania, he would not qualify for full Medicaid benefits (he would be SLMB-only) because Pennsylvania’s income limit for their medically needy program is 44 percent of the federal poverty level (an income of about \$5,135).

Targeting assistance for low-income beneficiaries through the MSPs

The Commission stated in its 2008 report that the MSPs are a direct and efficient way to target assistance to low-income beneficiaries (Medicare Payment Advisory Commission 2008). Because eligibility for MSPs is based on a beneficiary’s income and assets, the assistance provided through MSPs is directly targeted to low-income beneficiaries. Moreover, under the QI and SLMB programs, cost-sharing incentives at the point of service are maintained because beneficiaries in those programs do not receive assistance with their Part A and Part B deductibles, coinsurance, or copayments.

Policy discussions related to providing additional protections for low-income beneficiaries often include higher payments to plans or certain providers who tend

to serve them. For example, some believe that payments to Medicare Advantage (MA) plans that exceed the cost of furnishing services to the same population under FFS Medicare are a way of providing extra help for low-income beneficiaries who are more likely to enroll in MA plans. However, higher MA payments and extra benefits financed by those payments do not go only to low-income beneficiaries. Rather, all enrollees in a given MA plan receive the same extra benefits, low income or not. The Commission, therefore, has argued that MA payments are not a direct or efficient way to target assistance to low-income beneficiaries (Medicare Payment Advisory Commission 2008).

Finally, during the Commission’s previous discussion of the effects of supplemental coverage, some argued that medigap plans are especially important for protecting low-income beneficiaries from catastrophic financial liability. Although medigap plans fill in some or all of Medicare’s cost sharing, their premiums are much higher than their expected benefits because a large share of medigap premiums covers these plans’ administrative costs. Moreover, supplemental coverage policies in general can impose additional costs on the Medicare program that are not accurately reflected in the supplemental plans’ premiums. Under minimal exposure to cost sharing, beneficiaries have incentives to obtain more care without experiencing commensurate additional costs, and providers have no incentives to manage utilization. For these reasons, medigap plans are neither a targeted nor efficient way to subsidize low-income beneficiaries’ health care costs.

Rationale for the Commission's 2008 recommendation

The Commission's 2008 recommendation to align MSP and LIS income eligibility levels was based on analyses of low-income beneficiaries' income and Medicare OOP spending. The Commission's main findings are stated here:

- **Medicare beneficiaries age 65 and older were more likely to be low income than the non-Medicare population under age 65.** According to the Current Population Survey (CPS), the median income of an individual age 65 or older in 2006 was \$17,045, compared with \$28,077 for an individual younger than age 65 (Medicare Payment Advisory Commission 2008).
- **Medicare beneficiaries spend a larger percentage of their income on OOP health costs.** In 2003, Medicare beneficiaries age 65 and older had median total annual OOP health care expenditures that were nearly three times as high as the median total annual OOP health care expenditures of the non-Medicare population under age 65. These OOP expenditures accounted for 12.5 percent of income for the 65-and-older population compared with 2.2 percent of income for the under-65 population (Desmond et al. 2007).
- **Low-income beneficiaries who did not receive financial assistance were more likely to forgo needed care.** Low-income beneficiaries eligible for, but not enrolled in, MSPs were more likely than those enrolled in MSPs to report avoiding physician visits because of cost (Federman et al. 2005).

Since the recommendation in 2008, the above findings remain generally true. Medicare beneficiaries still have lower incomes than non-Medicare individuals under age 65, and they are still more likely to be low income. According to the CPS, the median income of an individual age 65 or older in 2012 was \$20,380 (or about 180 percent of the 2012 federal poverty level of \$11,170), compared with \$29,788 for an individual younger than age 65 (Census Bureau 2013).

Relationship between the 2008 and 2012 recommendations

The Commission's 2008 recommendation would have the effect of increasing the number of low-income beneficiaries who are eligible for payment of their Part B premium, which is the type of financial assistance provided through MSPs for people with incomes above 100 percent of the federal poverty level. Under this recommendation, the Part B premium's roughly \$1,300 annual expense would be alleviated, enabling low-income beneficiaries to use these funds to pay the remainder of their Medicare OOP costs. Moreover, cost-sharing incentives under the redesigned FFS benefit would be preserved because beneficiaries' Part A and Part B deductibles and coinsurance would remain intact.

Although the Commission's 2008 recommendation to align MSP and LIS income eligibility was more general, the illustrative example included in the 2008 report to the Congress assumed that the QI program income eligibility threshold would be raised to 150 percent of the federal poverty level. A benefit to providing extra financial assistance through the QI program is that the program is already fully financed by the federal government. Therefore, increasing the income eligibility for this program would not increase state spending. However, assisting more low-income beneficiaries with their Part B premium would increase Medicare program spending.

Finally, increasing the QI income eligibility to 150 percent of the federal poverty level would directly target assistance to more low-income beneficiaries. And it would be consistent with the Commission's view that extra financial assistance is more directly and efficiently targeted through MSPs than through overpayments to providers or to Medicare Advantage. Part B premium assistance would be directly targeted to low-income beneficiaries because only those with incomes up to 150 percent of the federal poverty level and limited assets would be eligible for the assistance. Further, cost-sharing incentives at the point of service would be maintained because beneficiaries would not receive assistance with their deductibles, coinsurance, or copayments. ■

Endnotes

- 1 The federal poverty level is higher for Alaska (\$14,580 for an individual in 2014) and Hawaii (\$13,420 for an individual in 2014).
- 2 There are also asset limits for MSP and LIS eligibility. To be eligible, beneficiaries must have countable assets below a specified level. In 2014, the asset limit is \$7,160 for an individual. Some assets, such as an individual's primary residence and one car, are not counted toward the asset limit.
- 3 The fourth MSP category includes the qualified disabled working individuals (QDWIs). They are disabled individuals with incomes up to 200 percent of the federal poverty level who lost their Medicare Part A benefits because they returned to work but are eligible to purchase Medicare Part A. The resource limit for the QDWI program is lower than for other MSPs, at \$4,000 for an individual in 2014 (compared with \$7,160 for the other MSPs). Under QDWI benefits, beneficiaries are eligible for assistance with their Part A premium. In 2009, only 102 individuals were enrolled in the QDWI program.
- 4 Other full-benefit dual-eligible beneficiaries qualify for Medicaid benefits but are not enrolled in the MSPs because they do not meet the MSP income and/or asset eligibility criteria. States may—but are not statutorily obligated to—cover Medicare cost sharing for these beneficiaries.
- 5 In the majority of states, asset limits for full Medicaid benefits for the aged, blind, and disabled are \$2,000 for an individual and \$3,000 for a couple (Kaiser Commission on Medicaid and the Uninsured 2010).
- 6 Pennsylvania uses a six-month period for spend-down determinations. New York also uses a six-month period for spend-down determinations when a hospital stay is involved. This example assumes that the beneficiary's medical expenses are incurred within the last six months of the year.
- 7 Income thresholds for medically needy programs in New York and Pennsylvania are for 2014 (Medicaid and CHIP Payment and Access Commission 2014).

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CHAPTER

5

**Per beneficiary payment
for primary care**

Per beneficiary payment for primary care

Chapter summary

The Commission has a long-standing concern that primary care services are undervalued by the Medicare fee schedule for physicians and other health professionals (“the fee schedule”) compared with procedurally based services. That undervaluation has contributed to compensation disparities such that average compensation for specialist practitioners can be more than double the average compensation for primary care practitioners. For example, radiologists’ average annual compensation in 2010 was \$460,000, while the average for primary care physicians was \$207,000. Such disparities in compensation could deter medical students from choosing primary care practice, deter current practitioners from remaining in primary care practice, and leave primary care services at risk of being underprovided. While Medicare beneficiaries generally have good access to care, as shown in both patient and physician surveys, access for beneficiaries seeking new primary care practitioners raises more concern than access for beneficiaries seeking new specialists (Medicare Payment Advisory Commission 2014).

With the goals of directing more resources to primary care and rebalancing the fee schedule, the Commission made a recommendation in 2008 for a budget-neutral primary care bonus payment, funded by a reduction in payments for non–primary care services. The Patient Protection and Affordable Care Act of 2010 created a bonus program, but it was not budget neutral and thus required additional funding. The program provides

In this chapter

- The fee schedule provides inadequate support for primary care
- Commission’s recommendations to support primary care
- Experience with primary care bonus payment
- Converting the primary care bonus payment to a per beneficiary payment
- Design considerations for a per beneficiary payment
- Conclusion

a 10 percent bonus payment for primary care services provided by primary care practitioners from 2011 through 2015.

The Commission has also become increasingly concerned that the fee schedule is an ill-suited payment mechanism for primary care. The fee schedule is oriented toward discrete services and procedures that have a definite beginning and end. In contrast, primary care services ideally are oriented toward ongoing, non-face-to-face care coordination for a panel of patients. Some patients in the panel will require the coordination of only preventive and maintenance services. Others will have multiple complex chronic conditions and will require extensive care coordination. The fee schedule is not well designed to support these behind-the-scenes activities, and it is precisely these activities that will be crucial in the move to a more coordinated and efficient health care delivery system of the future.

The primary care bonus program expires at the end of 2015. The Commission believes that the additional payments to primary care practitioners should continue. While the amount of the primary care bonus payment—an average of \$3,938 per eligible practitioner in 2012—is not large and will probably not drastically change the supply of primary care practitioners, it is a step in the right direction. The Commission is considering the option of continuing the additional payments to primary care practitioners, but in the form of a per beneficiary payment. Replacing the primary care bonus payment with a per beneficiary payment could help to move away from a fee-for-service, volume-oriented approach and toward a beneficiary-centered approach that encourages care coordination, including the non-face-to-face activities that are a critical component of care coordination.

This chapter explores a per beneficiary payment for primary care and considers several design issues: requirements that practices must meet to receive the payment, mechanisms for attributing beneficiaries to practitioners or practices, and methods to fund the payment. Specific to funding, we considered two methods. One method is to fund a per beneficiary payment by reducing the payments of all services that are not eligible for the current primary care bonus payment by an equal percentage. A second method is to reduce the payments of services specifically identified as overpriced, service by service, and fund the per beneficiary payment with the savings. ■

Primary care physician perspectives on care coordination: Findings from focus groups

The Commission conducts annual focus groups in select markets aimed at providing more qualitative descriptions of primary care physician and beneficiary experiences with the Medicare program. We conduct focus groups in markets where Medicare beneficiaries have reported experiencing relatively poor access to routine, specialty, and needed care on the Consumer Assessment of Healthcare Providers and Systems® survey. In selecting from the markets where Medicare beneficiaries report relatively poor access to care, we also factor in geographic and urban/rural diversity. In 2012 and 2013, Commission staff conducted focus groups in the following markets: the Bronx, NY; Greenville, SC; Chicago, IL/Gary, IN; and Richmond, VA. In each market, we held two focus groups with primary care physicians and three focus groups with Medicare beneficiaries. Each focus group consisted of 9 to 11 individuals. The primary care physicians who participated in the focus groups included solo practitioners, those organized in small group practices or large group practices, and those employed within hospital-based practices. Some of the primary care physicians were also part of care coordination initiatives, including medical homes. In each market, Commission staff also visited health systems, hospitals, physician offices, and other providers. Many of the providers we visited were also part of care coordination initiatives.

During the focus groups, primary care physicians reported numerous challenges to coordinating beneficiaries' care. Communication breakdowns between the primary care physicians and other providers (usually specialists) and between primary care physicians and hospitals were described as main impediments to care coordination. For example, some primary care physicians reported having to delay

primary care appointments when specialists did not provide reports on referred patients. Some primary care physicians also said that when one of their patients was in the hospital, they were rarely notified, if at all, of the patient's admission—even if that physician had privileges in that hospital.

Many of the primary care physicians in the focus groups stated that care coordination activities could help improve quality of care. Primary care physicians and other providers already participating in patient-centered medical homes said care coordination activities did improve the way they practice. Care coordination activities included more team-based care, increased face-to-face time with patients, follow-up with patients after primary care visits (e.g., through phone calls), checking in with patients after a hospital stay, improved communication with specialists, increased preventive care, and increased patient education.

However, primary care physicians and other providers reported that significant financial investments are required to implement and maintain a fully developed care coordination model. For example, many providers had to hire new staff or delegate new responsibilities to existing staff to implement the care coordination activities that resulted in the above improvements. Some primary care physicians in the focus groups stated that those financial investments are impediments to developing care coordination activities and pursuing initiatives such as medical homes. This sentiment was more common among the solo practitioners and those in small group practices. Moreover, several primary care physicians reported having looked into the process of being certified as a patient-centered medical home, but decided it was not worth pursuing for financial reasons. ■

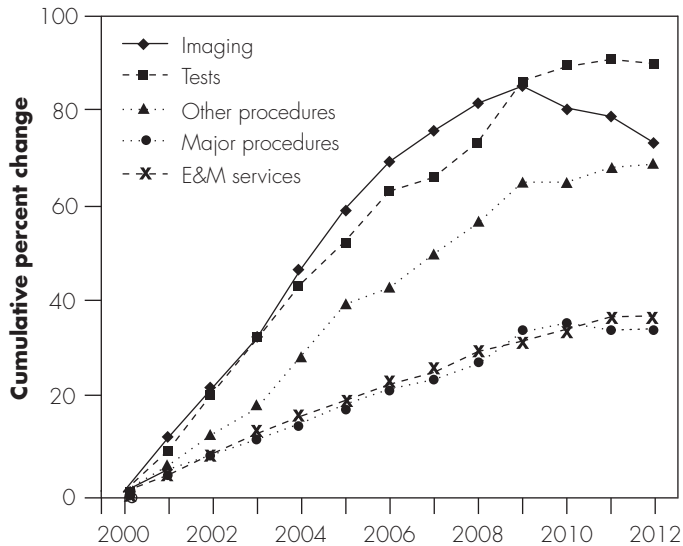
Background

Primary care is essential to delivery system reform, but the current Medicare fee schedule for physicians and other health professionals undervalues it relative to specialty care and does not explicitly pay for non-face-to-face care coordination (see the text box for a discussion of physician perspectives on care coordination). Those shortcomings

of the fee schedule have contributed to compensation disparities between primary care practitioners and specialists such that average compensation for some specialties can be more than double that of primary care practitioners. Faced with such compensation disparities, practitioners may increasingly opt for specialty practice over primary care practice, exposing beneficiaries to an increasing risk, in the long run, of impaired access to primary care.

FIGURE 5-1

Growth in the volume of procedurally based services generally exceeds that of E&M services, 2000–2012



Note: E&M (evaluation and management). Volume growth for E&M from 2009 to 2010 is not directly observable because of a change in payment policy for consultations. To compute cumulative volume growth for E&M through 2011, we used a growth rate for 2009 to 2010 of 1.85 percent, which is the average of the 2008 to 2009 growth rate of 1.70 percent and the 2010 to 2011 growth rate of 2.00 percent.

Source: MedPAC analysis of claims data for 100 percent of Medicare beneficiaries.

The Commission has made several recommendations to address the inadequacies of the fee schedule. To rebalance the fee schedule, the Commission has proposed identifying overpriced services and pricing them appropriately, replacing the sustainable growth rate (SGR) formula with payment updates that are higher for primary care than specialty care, and establishing a primary care bonus payment funded from non-primary care services. To advance support for coordinated care, the Commission recommended establishing a medical-home pilot. A variant of the recommendation to identify overpriced services and price them appropriately was established under the Protecting Access to Medicare Act of 2014. Variants of the recommendations for a primary care bonus payment and a medical-home pilot were established under the Patient Protection and Affordable Care Act of 2010 (PPACA).

The primary care bonus program created by PPACA expires at the end of 2015. This chapter explores the option of replacing the primary care bonus payment, after it expires, with a per beneficiary payment for eligible primary care practitioners. In establishing a per beneficiary

payment for primary care, several design issues need to be considered, including requirements that practices must meet to receive the payment, mechanisms for attributing beneficiaries to practitioners or practices, and methods to fund the payment.

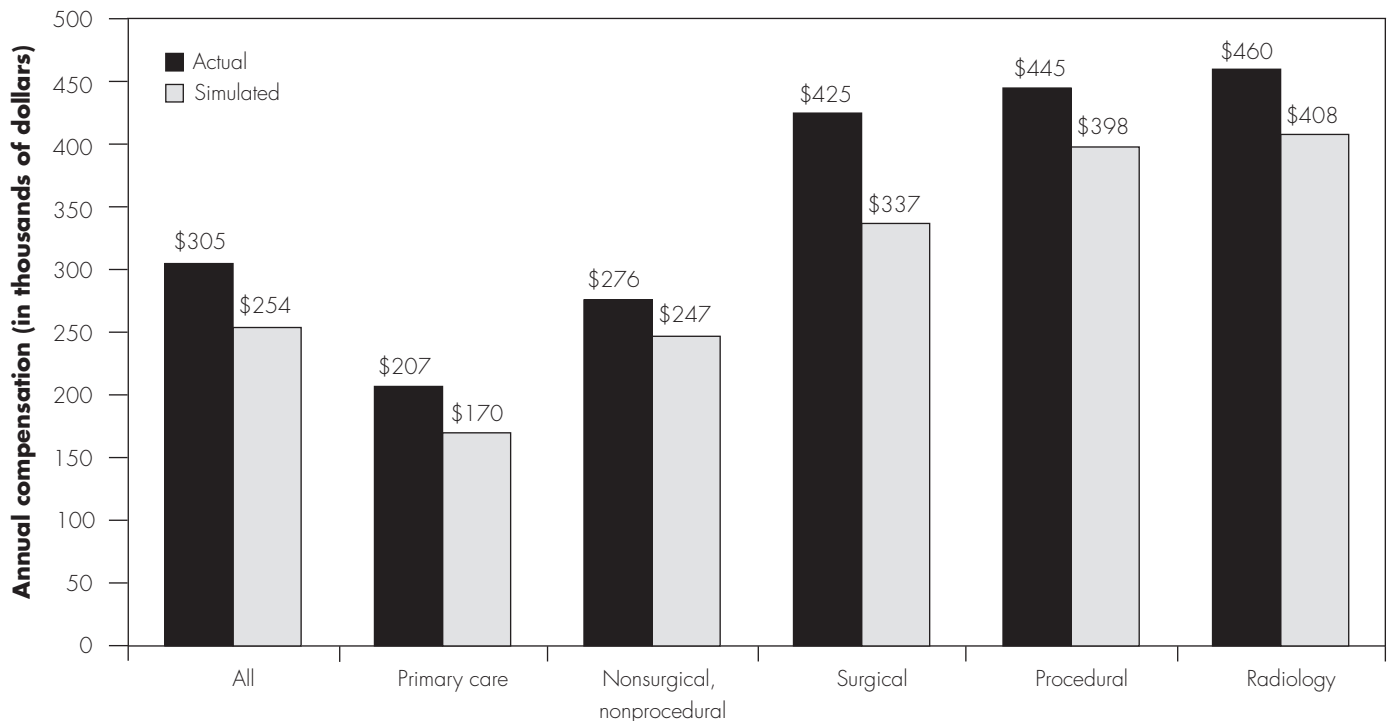
The fee schedule provides inadequate support for primary care

The fee schedule undervalues primary care relative to procedurally based services, leading to compensation disparities between primary care and specialty care. Those compensation disparities may, in the long run, expose beneficiaries to an increased risk of impaired access to primary care.

Undervaluation of primary care services

The undervaluation of primary care services stems from at least two problems with the fee schedule. First, the payment per primary care service is undervalued relative to payments per procedurally based services. Second, the volume of procedurally based services can be increased more readily than the volume of primary care services. Payment for services is based on an assessment of how much time and effort services require relative to one another. Over time, those assessments can get out of balance as the amount of time and effort required for procedurally based services declines due to advances in technology, technique, and other factors. Primary care services—generally defined as a subset of evaluation and management (E&M) services that include office visits, nursing facility visits, and home visits—tend to be labor intensive and so do not lend themselves to similar reductions in time and effort. Because those changes in relative time and effort are not quickly reflected in the fee schedule, procedurally based services become overpriced relative to primary care services over time. For those same reasons, procedurally oriented specialties can more easily increase the volume of services they provide (and therefore their revenue from Medicare), while other specialties—particularly those that spend most of their time providing labor-intensive primary care services—have limited ability to increase their volume.

Figure 5-1 groups procedurally based services into the categories of imaging (e.g., chest X-rays), tests (e.g., hemoglobin counts), major procedures (e.g., aneurysm repair), and other procedures (e.g., minor dermatological procedures). From 2000 to 2012, the growth in the

FIGURE 5-2**Disparities in physician compensation were widest when primary care was compared with proceduralists and radiologists, 2010**

Note: Simulated compensation is compensation as if all services were paid under the Medicare physician fee schedule.

Source: Urban Institute and Medical Group Management Association (MGMA) analysis of 2010 data from the MGMA's Physician Compensation and Production Survey on behalf of the Commission. The analysis is an update of earlier work performed on behalf of the Commission (for a description of the original analysis see Berenson et al. 2010).

volume of procedurally based services (other than major procedures) exceeded that of E&M services. Over that time period, cumulative growth in the volume of imaging, tests, and other procedures totaled 73 percent, 90 percent, and 69 percent, respectively, surpassing the cumulative growth in the volume of E&M services of 37 percent (Figure 5-1).

Compensation disparities between primary care and specialty physicians

The undervaluation of primary care services leads to compensation disparities between primary care and specialty care. Based on an analysis of 2010 data, actual physician compensation averaged about \$305,000 (Urban Institute and Medical Group Management Association (MGMA) analysis of 2010 data from the MGMA's Physician Compensation and Production Survey on behalf of the Commission) (Figure 5-2).¹

Compensation was much higher for some specialties than it was for others. The specialty groups with the

highest compensation were the procedural group and radiology. (The procedural specialties in this analysis are cardiology, dermatology, gastroenterology, and pulmonary medicine.) Actual compensations for the procedural group and radiology were about \$445,000 and \$460,000, respectively—more than double that of the \$207,000 average for primary care physicians.^{2, 3}

Differences between Medicare's fees and the fees of other payers do not explain the disparities. Simulated compensations were also calculated as if all services provided by physicians were paid under Medicare's fee schedule. Simulated annual compensation for all specialties averaged about \$254,000—17 percent lower than average actual compensation. Simulated, average annual compensation was about \$408,000 for radiologists and about \$398,000 for procedural physicians. Simulated compensation at those levels was still more than double that of the average simulated compensation for primary care physicians of \$170,000. Under some pricing mechanisms, such disparities in compensation could be

**TABLE
5-1**

Average bonus payments per eligible primary care practitioner, 2011 and 2012

	Total bonus payment (in millions)	Eligible practitioners	Average bonus payment per eligible practitioner	Average bonus payment per eligible practitioner in top quartile of the bonus distribution
2011	\$558	156,673	\$3,562	\$9,900
2012	\$664	168,685	\$3,938	\$9,300

Source: MedPAC analysis of claims data for 100 percent of Medicare beneficiaries, Centers for Medicare & Medicaid Services 2013a, Centers for Medicare & Medicaid Services 2012b.

based on differences in the value of services provided. However, these factors are not taken into account in the prices set under the Medicare fee schedule. A primary goal of the fee schedule is for payment to reflect the time and effort required to provide services without regard to specialty designation—in other words, to provide equal payment for equal work across specialties (Berenson et al. 2010).⁴

Access to primary care services

Such disparities in compensation can deter medical students from choosing primary care specialties and deter current practitioners from remaining in primary care practice, exposing beneficiaries to an increased risk in the long run of impaired access to primary care. Medicare beneficiaries generally have good access to care. However, access to primary care could become more difficult in the future as the newly insured seek care and as the baby-boom generation ages into retirement, increasing the number of Medicare beneficiaries and decreasing the number of practitioners.

Commission’s recommendations to support primary care

In response to these trends in the primary care workforce and the importance of primary care to both coordinated care and future payment reforms to improve the delivery of care, the Commission has made a number of recommendations to address the undervaluation of primary care services in the fee schedule relative to other services.

The Commission made recommendations that the Secretary identify overpriced services and collect data to improve the estimates of work and practice expense in the fee schedule (Medicare Payment Advisory Commission 2011, Medicare Payment Advisory Commission 2006a).

A variant of that recommendation was enacted into law in April of this year under the Protecting Access to Medicare Act. The Commission also made a recommendation that CMS establish a medical-home pilot project (Medicare Payment Advisory Commission 2008). A variant of that recommendation was enacted into law in 2010 under PPACA. The Commission’s recommendation for replacing the SGR system would provide higher updates for primary care relative to specialty care (Medicare Payment Advisory Commission 2011). Finally, the Commission made a recommendation to establish a budget-neutral primary care bonus payment, funded by a reduction in payments for non–primary care services. PPACA created a bonus program, but it was not budget neutral and thus required additional funds (Medicare Payment Advisory Commission 2008).

Experience with primary care bonus payment

The primary care bonus program enacted into law in 2010 under PPACA (named the Primary Care Incentive Payment program) establishes a 10 percent bonus payment for eligible primary care services provided by eligible primary care practitioners. Eligible primary care services are a subset of E&M services made up primarily of office visits, nursing facility visits, and home visits. Visits to hospital inpatients and emergency department care are not considered eligible primary care services. Eligible primary care practitioners include practitioners who have a primary Medicare specialty designation of family practice, internal medicine, pediatrics, geriatrics, nurse practitioner, clinical nurse specialist, or physician assistant and for whom eligible primary care services account for at least 60 percent of allowed charges under the fee schedule (excluding hospital inpatient care and emergency department visits from the calculation). Practitioners do

Medicaid fee increase for primary care

Under a provision in the Patient Protection and Affordable Care Act of 2010, states are required in 2013 and 2014 to pay certain primary care physicians (and nonphysicians under their supervision) Medicaid fees that are at least equal to Medicare fees for primary care services. The physicians eligible are those with a specialty designation of family medicine, general internal medicine, and pediatric medicine and those with a subspecialty within the three primary care categories. The federal government is funding the full cost of the fee increase, up to the difference between Medicaid fees as of July 1, 2009, and Medicare fees in 2013 and 2014 (Kaiser Commission on Medicaid and the Uninsured 2012).

CMS estimated that it would increase federal spending by \$5.8 billion in 2013 and \$6.1 billion in 2014 (Centers for Medicare & Medicaid Services 2012a).

On average, Medicaid fees for primary care services were expected to increase by 73 percent in 2013 (Zuckerman and Goin 2012). However, depending on the state, the estimated effect on Medicaid fees would have varied. Average primary care fees were expected to more than double in six states—Florida, New Jersey, Michigan, California, New York, and Rhode Island—and to increase more than 50 percent in a dozen more states (Zuckerman and Goin 2012). ■

not apply for the bonus. It is paid automatically based on the provider's specialty and claims history. The program began in 2011 and expires at the end of 2015. (See the text box for another primary care provision in PPACA—set to expire at the end of 2014—that raises Medicaid fees to equalize them with Medicare's.)

Bonus payments totaled \$558 million in 2011 and \$664 million in 2012 (Table 5-1) (Centers for Medicare & Medicaid Services 2013a, Centers for Medicare & Medicaid Services 2012b). About 157,000 practitioners were eligible for the bonus in 2011, and about 169,000 were eligible in 2012, or about 17 percent of all practitioners billing Medicare in those years. On average, eligible practitioners received an annual bonus of about \$3,600 in 2011 and \$3,900 in 2012. However, practitioners who provided more primary care services to a greater number of fee-for-service (FFS) Medicare beneficiaries received much more than the average. The average bonus for practitioners in the top quartile of the bonus distribution was about \$9,900 in 2011 and \$9,300 in 2012.

Converting the primary care bonus payment to a per beneficiary payment

The Commission is considering the option of replacing the primary care bonus payment after it expires with a per beneficiary payment for eligible primary care practitioners. Replacing the primary care bonus payment

with a per beneficiary payment could help Medicare move away from the volume-oriented FFS payment approach and toward a beneficiary-centered payment approach that encourages care coordination, including the non-face-to-face activities that are critical components of care coordination. Of course, a per beneficiary payment in itself will not guarantee an increase in care coordination activities because practitioners could use the additional funds for other purposes, but it may be a step in the right direction. Separately, CMS has recently created FFS billing codes for some non-face-to-face activities (see text box, p. 81) even though FFS payment has typically focused on face-to-face activities.

In converting the primary care bonus payment to a per beneficiary payment, primary care practitioners would be defined as those practitioners enrolled in Medicare with a primary specialty designation of family practice, internal medicine, pediatrics, geriatrics, nurse practitioner, certified clinical nurse specialist, or physician assistant and for whom eligible primary care services account for at least 60 percent of allowed charges under the fee schedule (excluding hospital inpatient care and emergency department visits from the calculation). Eligible primary care practitioners would receive monthly payments based on the number of FFS Medicare beneficiaries who received eligible primary care services.

For example, eligible practitioners provided primary care services to 21 million FFS beneficiaries in 2012, for which practitioners received an average of \$31 per beneficiary

**TABLE
5-2**

Converting primary care bonus payment to per beneficiary payment, 2011 and 2012

	Total bonus payment (in millions)	Number of beneficiaries provided eligible primary care services by eligible practitioners (in millions)	Average bonus payment per FFS beneficiary	Monthly per beneficiary payment
	[a]	[b]	[c] = [a]/[b]	[d] = [c]/[12]
2011	\$558	20.4	\$27.35	\$2.28
2012	\$664	21.3	\$31.17	\$2.60

Note: FFS (fee-for-service).

Source: MedPAC analysis of claims data for 100 percent of Medicare beneficiaries; Centers for Medicare & Medicaid Services 2013a; Centers for Medicare & Medicaid Services 2012b.

in that year under the primary care bonus program (Table 5-2). This amount would equal a monthly, per beneficiary payment of about \$2.60. (Results based on 2011 data are similar and shown in Table 5-2.) Medicare, Medicaid, and the private sector do have programs testing per beneficiary payments (text box, pp. 82–83). In those programs, monthly per beneficiary payments range from a low of \$1.50 to as much as \$30.00.

Based on the example of a monthly, per beneficiary payment of \$2.60, eligible practitioners would receive about \$3,900 in additional Medicare revenue per year, on average. Practitioners who provided primary care services to more FFS Medicare beneficiaries than the average practitioner would earn more. To extend the example, consider a primary care practitioner with a panel of 1,400 patients of which 280 (20 percent) are FFS Medicare beneficiaries. A \$2.60 monthly, per beneficiary payment would provide \$8,700 in additional Medicare revenue per year.

Design considerations for a per beneficiary payment

In establishing a per beneficiary payment for primary care, several design issues—including practice requirements, beneficiary attribution, and funding mechanisms—need to be considered. Those considerations depend on the goals behind the per beneficiary payment. Goals could include increasing the compensation of primary care providers, directing more resources to primary care services, or redesigning the delivery of primary care. The goals that can be attained are in turn dependent on the amount of funding for the per beneficiary payment. A small per

beneficiary payment—such as the example just discussed of \$2.60 per beneficiary per month—may not seem like it would provide practitioners with the resources and incentives to undertake rigorous practice transformation. However, Medicare is not working in isolation. Other payers also are providing per beneficiary payments and other types of support for primary care (see text box, pp. 82–83). Even if Medicare contributes only modestly, the Commission believes it is worthwhile to do so, and allowing the Medicare primary care bonus to expire without a replacement would send a poor signal to primary care practitioners.

Practice requirements

Should any additional criteria be required of primary care practitioners to be eligible for the per beneficiary payments? Having practice requirements could provide a specific return for the additional funds directed toward primary care. For example, in return for a per beneficiary payment, practices could be required to improve access. Improved access could take many forms: increasing office hours, maintaining 24-hour phone coverage, and offering other opportunities for patient–caregiver communication such as e-mails or texting. Practices could be required to engage in care coordination activities such as employing a care manager and developing care plans. Practices also could gain eligibility for the per beneficiary payment by meeting specified outcomes or performance thresholds, for example, based on the appropriate use of services.

However, evidence concerning the effect of practice requirements on reducing health care spending and improving quality is not clear. Practice requirements could add to costs and may not increase value. Practice

Fee-for-service billing codes for non-face-to-face activities

While fee-for-service (FFS) payment has typically focused on face-to-face activities, CMS has recently created FFS billing codes for some non-face-to-face activities—transitional care management codes and a chronic care management code.

Transitional care management codes

CMS established two new transitional care management billing codes in the 2013 fee schedule final rule. Starting January 1, 2013, the Medicare program pays for 30 days of transitional care provided to beneficiaries recently discharged from a hospital, skilled nursing facility, or other facility to a community setting. The two codes correspond to higher and lower intensity medical decision making. The payment is designed to cover activities required to provide comprehensive transitional care management as beneficiaries return home.⁵ Use of the new codes has been relatively low because of claims processing issues and because there is often a lag for clinicians to adopt new billing conventions. CMS has released new guidance for billing and has modified its payment processes to clarify when providers should bill for the service, which should increase the number of paid claims (Centers for Medicare & Medicaid Services 2013b).

Chronic care management code

CMS will be creating a new code under the fee schedule for non-face-to-face chronic care management services for the 2015 fee schedule. The new separately payable code will be for non-face-to-face chronic care management services furnished to patients with multiple (two or more) chronic conditions expected to

last at least 12 months, or until the death of the patient, that place the patient at significant risk of death, acute exacerbation/decompensation, or functional decline. CMS finalized the establishment of the new code in the 2014 fee schedule final rule, but CMS plans to finalize some remaining design elements as part of the 2015 rulemaking (Centers for Medicare & Medicaid Services 2013b).

The requirement when billing for chronic care management services will be that at least 20 minutes of those services be provided over a 30-day period, and CMS will pay only one practitioner per beneficiary for each 30-day period. Before a practitioner can furnish or bill for chronic care management services, the eligible beneficiary must provide his or her written agreement to have the services provided, and the beneficiary will be charged cost sharing.

As part of the scope of chronic care management services, CMS will require practitioners to provide 24-hours-a-day, 7-days-a-week access to health care providers in the practice. CMS is developing practice standards for furnishing chronic care management services. Potential standards could include requiring the practice to use electronic health records that meet meaningful use standards, to employ at least one or more advanced practice registered nurses or physician assistants to provide chronic care management services, to demonstrate the use of written protocols in providing chronic care management services, and to ensure that all practitioners involved in providing chronic care management services have access to the beneficiary's electronic health record. ■

requirements could also limit practitioner participation, especially among small practices. Finally, requirements would also necessitate some sort of process to ensure that practices are in compliance, creating additional costs for practices and the Medicare program.

Beneficiary attribution

Unlike the service-based primary care bonus payment, a per beneficiary payment necessitates attributing a beneficiary to a practitioner to ensure that the right practitioner gets paid and that Medicare does not make

duplicate payments to multiple practitioners on behalf of the same beneficiary. In an ideal world, a Medicare beneficiary would designate her primary care practitioner. The designated primary care practitioner would provide the majority of the beneficiary's primary care for that year and for years to come, fostering a strong relationship and continuity of care. However, attributing a beneficiary to the right practitioner could be complicated in practice.

A beneficiary may not make a designation either because she is unaware of the need to do so, does not understand the purpose of making a designation, or feels the time

Examples of per beneficiary payment programs

Per beneficiary payments have been used for some time by government health programs to reimburse physicians for engaging in activities that are not directly reimbursable under the fee schedule, such as coordinating care for complex patients or developing a patient-centered medical home (PCMH). These programs have traditionally focused on Medicaid beneficiaries. Under the Patient Protection and Affordable Care Act of 2010 (PPACA), the Center for Medicare and Medicaid Innovation (CMMI) within CMS has developed several programs designed to promote primary care that also have a per beneficiary payment component. This text box outlines a few government-sponsored examples of these programs, including parameters like eligible beneficiaries and providers, practice requirements, and the size of the payments associated with them. Private payers like Blue Cross Blue Shield and Aetna also use this payment model in primary care, but little information about these programs is available because it is considered proprietary.

Medicaid

State Medicaid programs have varying requirements for providers to qualify for per beneficiary payments, and payment amounts can range from as little as \$1.50 per beneficiary per month to as much as \$30 per beneficiary per month. Most fall between \$3.00 and \$7.00. Requirements often include some degree of medical home certification, limitations on the severity and/or complexity of the patients who qualify, and in many cases practice requirements like 24-hour access, same-day appointments, or additional provider training. Often, the amount of the per beneficiary payment is determined, not by an estimate of costs to meet practice requirements, but by the funds available to the program for that purpose.

Alabama Patient 1st Program: Alabama provides a multicomponent case management fee, at a maximum of \$2.60 per beneficiary per month, to providers who agree to serve as the designated primary care practitioner for Medicaid beneficiaries in the state, in addition to the regular Medicaid fee-for-service (FFS) fees for providing specific medical services.

To receive this fee, providers must offer access to office resources 24 hours per day and use health information technology in some way. One use of this technology is

“in-home monitoring,” in which Patient 1st enrollees with certain chronic conditions like diabetes or hypertension can monitor their conditions at home by transmitting readings to a centralized database. Providers can receive higher payments by completing training modules on topics like health literacy and medical homes. Performance is measured and providers share in savings with the state. The program has been in place since 2004.

Outside evaluation of this ongoing program will include analysis of Consumer Assessment of Healthcare Providers and Systems® (CAHPS®) surveys for change in patient experience within each community network pilot and before-and-after financial analysis. Key outcomes of interest for the community network pilots will include improved clinical outcomes, improved patient satisfaction, and Medicaid cost containment. Specific measures that will be used include CAHPS survey results, emergency department use by persons with asthma, HbA1C measures for persons with diabetes, inpatient hospitalization rates, immunization rates, and average number of office visits.

Community Care of North Carolina (CCNC): This program has been in place since 1998 and has been statewide since 2002. All Medicaid beneficiaries are eligible, including dual eligibles. In 2011, Medicare beneficiaries in seven counties also became eligible as part of a multipayer demonstration project (see below). The current per beneficiary per month payment is \$5 for aged, blind, and disabled patients and \$3 for all others.

Practices qualify if they agree to participate in the state’s primary care patient coordination system and provide, coordinate, or authorize all necessary medical care for the practice’s enrollees. A regional CCNC entity assists in care management, including identifying resources, collecting performance data, and providing feedback to practices. The feedback includes monthly and quarterly reports on utilization in comparison with peer group practices.

Center for Medicare and Medicaid Innovation (CMMI)

CMMI has introduced primary care-focused demonstration projects that use per beneficiary

(continued next page)

Examples of per beneficiary payment programs (cont.)

payments in several different configurations, for both Medicare and Medicaid beneficiaries.

Comprehensive Primary Care Initiative: The Comprehensive Primary Care Initiative (CPCI) is a multipayer initiative fostering collaboration between public and private health care payers to strengthen primary care. In August 2012, CMS announced the selection of almost 500 primary care practices in 7 localities, which include 2,347 providers serving an estimated 315,000 Medicare beneficiaries, to participate in the CPCI. The CPCI will test innovations in both service delivery and payment. Comprehensive primary care is characterized as having the following five functions: risk-stratified care management, access and continuity, planned care for chronic conditions and preventive care, patient and caregiver engagement, and coordination of care across the “medical neighborhood.” The per beneficiary payments in this initiative are to be used to further those goals.

The payment model includes a monthly care management fee paid to the selected primary care practices on behalf of their FFS Medicare beneficiaries and, in years 2 through 4 of the initiative, the potential to share in any savings to the Medicare program. In years 1 and 2, the average per beneficiary per month amount is \$20, and in years 3 and 4 it drops to \$15. Practices also will receive compensation from other payers participating in the initiative, including private insurance companies and other health plans, which will allow them to integrate multipayer funding streams to strengthen their capacity to implement practice-wide quality improvement.

Multi-Payer Advanced Primary Care Practice (MAPCP) demonstration: Under this demonstration, CMS will participate in multipayer reform initiatives that are currently being conducted by states to make advanced primary care practices more broadly available. The demonstration will evaluate whether advanced primary care practice will reduce unjustified use and expenditures; improve the safety, effectiveness, timeliness, and efficiency of health care; increase patient decision making; and increase the availability and delivery of care in underserved areas. The care management fee, which is less than \$10 but varies by state, is intended to cover care coordination, improved

access, patient education, and other services to support chronically ill patients.

- **Michigan Primary Care Transformation Project:** This program covers commercial, Medicaid, and Medicare patients at participating practices. These practices, which must be medical homes certified either by the National Committee for Quality Assurance (NCQA) (level 2 or 3) or Blue Cross Blue Shield, receive a three-part payment for completing different activities: \$3 per beneficiary per month for care management, \$1.50 for practice transformation support, and up to \$3 for performance improvement. Medicare pays up to \$2 more for its beneficiaries. The project began late in 2011.
- **Rhode Island Chronic Care Sustainability Initiative Project:** This pilot program covers all insured adults, including Medicare beneficiaries, with chronic illnesses. The pilot sites agree to seek NCQA medical home recognition, to participate in training in the Chronic Care Model, and to hire a nurse care manager. In exchange, sites receive a \$3 per beneficiary per month payment for implementing medical home features and an additional \$0.80 per beneficiary per month for on-site care management activities. The program initially focuses on beneficiaries with coronary artery disease, diabetes, depression, and smoking cessation. Performance measures include cost and utilization measures for emergency department services, prescription drugs, and hospital admissions. This project began in 2008 and was included in the MAPCP in 2011.

Federally Qualified Health Center (FQHC) demonstration: The 473 participating FQHCs are expected to achieve level-3 patient-centered medical home recognition, help patients manage chronic conditions, and actively coordinate care for patients. To help participating FQHCs make these investments in patient care and infrastructure, the demonstration will pay them a \$6 monthly care management fee for each eligible Medicare beneficiary receiving primary care services. This demonstration began November 1, 2011, and will run until October 31, 2014. ■

and effort involved is too burdensome. Also, a beneficiary could designate one practitioner as her primary care practitioner, but be furnished care by another primary care practitioner throughout the year. In that case, the per beneficiary payment would not be well targeted. A beneficiary may also switch primary care practitioners from year to year, increasing the administrative complexity of designation for both the beneficiary and CMS. Finally, a beneficiary could feel pressured to sign designation forms if asked to do so by a practitioner at an office visit.

As an alternative, CMS could assign beneficiaries to primary care practitioners based on who furnished the majority of their primary care services in a year. An advantage of this option is that it would be easier to administer. Like the primary care bonus payment, the practitioner would receive payment automatically without extra paperwork requirements on behalf of practitioners and beneficiaries. This option requires a decision as to whether beneficiaries would be attributed prospectively or retrospectively.

In prospective attribution, beneficiaries are attributed to practitioners at the beginning of the performance year based on the majority of primary care services furnished in the previous year. In this case, the practitioner could be paid throughout the year and may be better positioned to make front-end investments in infrastructure and staffing that facilitate care coordination. However, practitioners could also be paid for beneficiaries no longer under their care.

In retrospective attribution, beneficiaries are attributed to practitioners at the end of the performance year based on the majority of primary care services furnished in that year. In this case, the practitioner would be paid only for beneficiaries under his or her care. But, the per beneficiary payment would have to be paid after year's end, which could make it more difficult to make front-end investments in the practice. Of course, for practitioners who see the same number of Medicare beneficiaries from year to year, annual per beneficiary payments would be similar under prospective and retrospective attribution.

Hybrids of the three approaches—designation, prospective attribution, and retrospective attribution—also could be considered. For example, CMS could assign beneficiaries prospectively and adjust for errors retrospectively. Alternatively, beneficiaries could be asked to designate their primary care practitioners, but if beneficiaries have not made designations after a period of time, CMS

could attribute them to practitioners prospectively or retrospectively.

Data on the number of primary care practitioners seen annually by beneficiaries could help determine how to attribute beneficiaries to practitioners. Medicare FFS beneficiaries typically do see multiple practitioners and even multiple primary care practitioners in a year (Medicare Payment Advisory Commission 2006a, Pham et al. 2007). However, for the per beneficiary payment, we are concerned with attributing beneficiaries who received eligible primary care services to the eligible primary care practitioners who provided those services. Limiting to that set of beneficiaries, services, and practitioners greatly reduces the number of practitioners seen by beneficiaries in a year: In 2012, 69 percent of beneficiaries received eligible primary care services from only one eligible primary care practitioner, and 90 percent of beneficiaries received eligible primary care services from one or two eligible primary care practitioners.

It also would be useful to know the extent to which beneficiaries switch primary practitioners from year to year. A 2007 study of 2000–2001 claims data found that 20 percent of Medicare beneficiaries had a change in the primary care practitioner who performed the majority of their primary care services (Pham et al. 2007). We plan to investigate this issue further with more recent claims data.

Finally, beneficiaries may be receiving primary care services from multiple practitioners at the same practice. In that case, it may be more appropriate to attribute beneficiaries to practices rather than to individual practitioners. We will investigate this concept in future work.

Funding

Funding the per beneficiary payment for primary care can address two goals: increase support for primary care and rebalance the fee schedule. These goals can be achieved by reducing payments for overpriced services and redistributing the savings to the per beneficiary payment. One funding method is to apply an equal percentage reduction to the payments of those services most likely to be overpriced: services in the fee schedule except those eligible for the primary care bonus. Another funding method is to reduce the payments for services specifically identified as overpriced on a service-by-service basis and fund the per beneficiary payment with the savings. This method would require a change in the current policy on redistribution of savings from overpriced services. Under both funding methods, we are assuming that beneficiaries

are not charged cost sharing to fund the per beneficiary payment for primary care.

Reducing fees of services not eligible for the primary care bonus payment

As discussed in the section on undervaluation of primary care services and illustrated in Figure 5-1 (p. 76), primary care services are composed largely of activities that require a practitioner’s time—taking the patient’s history; examining the patient; and engaging in medical decision making, counseling, and coordinating care. Those labor-intensive activities do not lend themselves to reductions in time and effort. By contrast, other services—especially procedurally based services—tend over time to become overpriced relative to primary care services due to advances in technology, technique, and other factors.

If primary care services are protected while payments are reduced for all other services, the specific payment reduction required would depend on the amount of the per beneficiary payment. As explained earlier, the current primary care bonus payment is equivalent to a per beneficiary payment of \$2.60 per month. With that payment amount as an example, one option would be to reduce fees for the 90 percent of the fee schedule not eligible for the primary care bonus payment. Under this option, the reduction would be 1.1 percent (Figure 5-3).

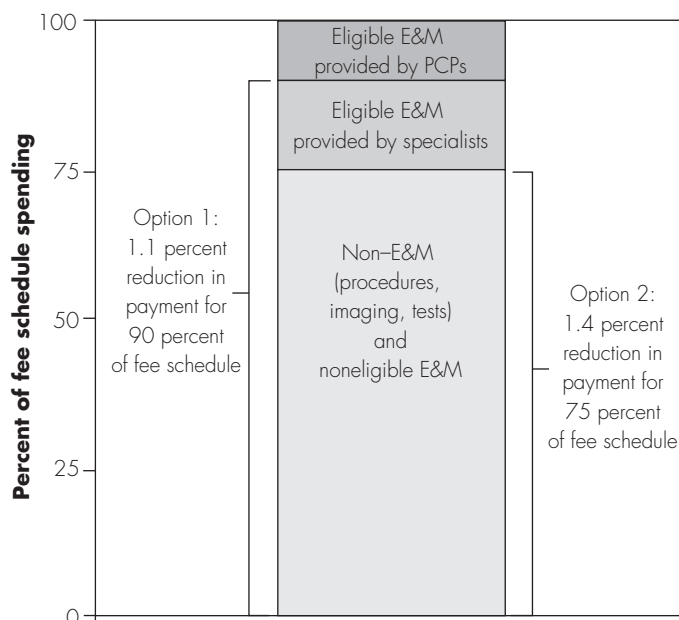
Another option would be to protect all bonus-eligible E&M services from fee reductions, regardless of a practitioner’s specialty designation and regardless of whether primary care services account for at least 60 percent of the practitioner’s allowed charges. In this case, funding would come from about 75 percent of the fee schedule. Because the funding would be coming from a smaller portion of the fee schedule, the reduction would be larger: 1.4 percent.

Reducing the fees of overpriced services

The Commission has made a series of recommendations on identifying and reducing payments for overpriced services (Medicare Payment Advisory Commission 2011, Medicare Payment Advisory Commission 2006b). Most recently—in our October 2011 letter on repeal of the SGR—the Commission recommended that the payment reductions should achieve an annual numeric goal for each of five consecutive years of at least 1 percent of the fee schedule. Redistributing 1 percent of the fee schedule each year from overpriced services would fund per beneficiary

FIGURE 5-3

Two options for funding the per beneficiary payment from services not eligible for the primary care bonus payment



Note: E&M (evaluation and management), PCPs (primary care practitioners). Eligible E&M services are E&M services eligible for the primary care bonus payment.

Source: MedPAC analysis.

per month payments of roughly \$2.60, \$5.20, \$7.80, \$10.40, and \$13.00 in years 1, 2, 3, 4, and 5, respectively.⁶

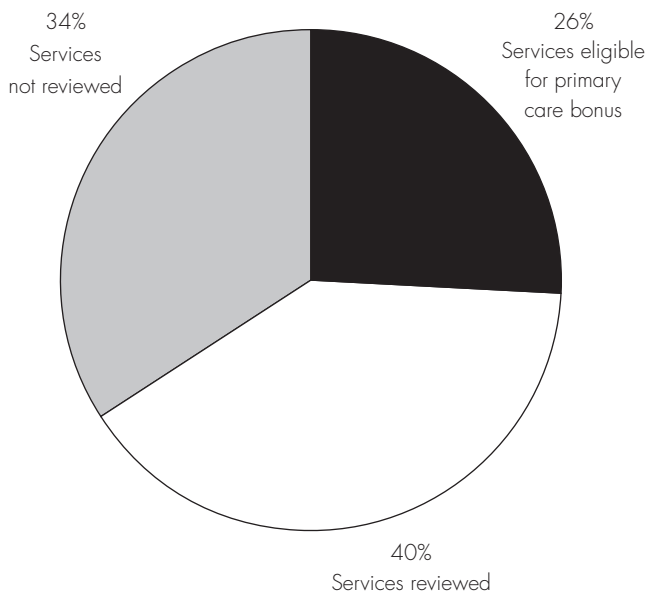
Achieving savings from overpriced services sufficient to fund a per beneficiary payment for primary care will require a concerted effort. It will require, first, review of the accuracy of the fee schedule’s relative value units (RVUs), either as part of a process of validating the RVUs—a PPACA requirement that is taking some time to fulfill—or in the meantime as part of a current initiative to review RVUs. Second, it will require a targeting of savings from overpriced services to the per beneficiary payment. Current policy is to distribute such savings to all services equally as a percentage adjustment to fee schedule payments.⁷

- **Validating the RVUs of overpriced services**—Under a provision in PPACA, the Secretary is required to establish a process to validate the fee schedule’s RVUs. The validation process is to include a sampling of services that meet criteria such as rapid growth,

**FIGURE
5-4**

**Further savings are possible
under potentially misvalued
services initiative, 2014**

**Services by review status
(as a percent of estimated allowed charges)**



Note: Percentages are each category's share of total fee schedule allowed charges. Services reviewed are those listed in fee schedule final rules for 2009 to 2014 as new, revised, or potentially misvalued.

Source: CMS final rules and utilization file for 2014 impacts.

use of new technologies, and substantial changes in practice expenses or that meet other criteria for identifying services that may be misvalued. The process is to consider work elements such as time, mental effort, and other factors.

As part of the validation process, the law gives the Secretary the authority to make appropriate adjustments to the RVUs for practitioner work. CMS sees validation of RVUs as a new requirement and one that would complement the ongoing efforts of the American Medical Association (AMA)/Specialty Society Relative Value Scale Update Committee (RUC) to provide recommendations on the valuation of fee schedule services.⁸

The fee schedule's RVUs for the work of physicians and other health professionals offer an example of how validation could occur.⁹ The statute defines this work as consisting of time and intensity—the amount

of time it takes to furnish a service and the intensity of work effort per unit of time. As a measure of the time component of this definition, CMS has a time estimate for each service with a work RVU.

Studies have shown that CMS's time estimates are inaccurate. Contractors working for CMS and the Assistant Secretary for Planning and Evaluation within the Department of Health and Human Services have found that the time estimates are too high for some services (Cromwell et al. 2007, Cromwell et al. 2004, McCall et al. 2006). The Government Accountability Office has found that the fee schedule does not adequately account for efficiencies that arise when a practitioner provides multiple services for the same patient on the same day (Government Accountability Office 2009).

To support validation of the time estimates and RVUs generally, the Commission recommended that the Secretary regularly collect data to establish more accurate RVUs (Medicare Payment Advisory Commission 2011). Further, to help assess whether Medicare's fees are adequate for efficient care delivery, the Commission recommended that the Secretary collect the data from a cohort of efficient practices rather than a sample of all practices. The Commission has worked with contractors to give the Secretary advice on how to collect the data.¹⁰

CMS is taking steps to fulfill the PPACA requirement on validating RVUs. First, the agency has established a contract with the RAND Corporation for development of a model to predict work RVUs and the components of those RVUs—time and intensity. The contractor will use a model design informed by statistical methodologies and an approach used to develop the RVUs initially. The contractor then will test the model with a representative set of CMS-provided billing codes. During the project, the contractor will consult with a technical expert panel for advice on model design issues and interpretation of results. Second, CMS has established a contract with the Urban Institute for collection of time data from several physician practices. As part of the project, the contractor will use the data collected to develop objective time estimates. The contractor will then convene groups of physicians from a range of specialties to review the new time data and their implications for the fee schedule's work RVUs.

- **Reviewing RVUs under the current potentially misvalued services initiative**—Pending validation of the fee schedule’s RVUs, there is an initiative concerning potentially misvalued services now underway that can serve as a source of savings to fund a per beneficiary payment for primary care. Under this initiative, CMS is working with the RUC to identify and review services that meet certain screening criteria (e.g., high volume growth).

It has been argued that this potentially misvalued services initiative already has captured most of the potential savings from overpriced services (Madara 2013). The assertion is that the services not yet reviewed represent low-volume services or services with moderate RVUs and, therefore, that their review would not have a high impact on fee schedule spending.

There are several reasons why the potentially misvalued services initiative remains an important source of savings. First, the services not yet reviewed do account for a meaningful share of fee schedule spending: 34 percent (Figure 5-4). Second, while the initiative has produced savings, further savings are possible even among those services already reviewed. According to an AMA progress report, a total of 1,451 services have been reviewed (American Medical Association 2014). Work RVUs were reviewed for 1,085 services, practice expense RVUs were revised for 119 services, and billing codes were deleted for 247 services. Among the services whose work RVUs were reviewed, the RVUs were decreased for 531 services, but they were increased (120 services) or maintained (434 services) for another 554 services. Further examination of the services whose work RVUs were increased or maintained could lead to additional decreases in work RVUs.

One further source of savings concerns a factor in the fee schedule’s definition of the work of physicians and other health professionals. Recall that the statute defines this work as consisting of the time spent providing a service and the intensity of work effort per unit of time. Over the course of the potentially misvalued services initiative, estimates of the time professionals spend providing services have gone down for a number of services. However, their work RVUs have not gone down as much: The time estimates decreased by an average of 18 percent,

TABLE 5-3

Time estimates have decreased more than work RVUs, 2008–2014

	Number of services	Average percent change
Work RVUs	499	-7%
Time estimates	499	-18

Note: RVU (relative value unit). Services had work RVUs and time estimates in 2008 and 2014 and had a decrease in work RVUs, a decrease in work time estimate, or both.

Source: MedPAC analysis of physician time and RVU files from CMS.

but the work RVUs decreased by an average of 7 percent (Table 5-3). Such a disparity could arise if the RUC is offsetting some of the decreases in time by increasing intensity. (Inflation in the time estimates for some services could also have a small effect on the disparity.¹¹) Further review of the RVUs for these services could lead to decreases more in line with decreases in time estimates and, therefore, could increase the savings available to fund the per beneficiary payment for primary care.

- **Targeting savings from overpriced services**—When the fee schedule’s RVUs are changed, the Medicare statute requires that the effect on spending must be budget neutral.¹² Specifically, if decreases (or increases) in the fee schedule’s RVUs would have an impact of \$20 million or more on spending, CMS must make a compensating payment adjustment. The current policy is to redistribute the savings to all other services. Underpriced, accurately priced, and overpriced services all receive the same budget-neutrality adjustment.

Under the funding mechanism discussed here, the budget-neutrality policy would be revised and savings from overpriced services would be redistributed solely to the payment for primary care. In addition to providing a funding source, doing so would help rebalance the fee schedule.

Conclusion

The Commission remains concerned that—within Medicare’s fee schedule for the services of physicians

and other health professionals—primary care remains undervalued. Moreover, such FFS payment is ill suited as a payment method for the non-face-to-face activities in primary care. Those activities are necessary to achieve care coordination for Medicare beneficiaries, especially those with multiple chronic conditions. Expiration of the primary care bonus at the end of 2015 provides an opportunity to revisit the structure of payment for primary

care and to consider the alternative of a per beneficiary payment. The Commission plans to continue work on these issues, including design considerations for a per beneficiary payment: the payment amount, requirements that practices must meet to receive the payment, mechanisms for attributing beneficiaries to practitioners or practices, and methods for funding a per beneficiary payment. ■

Endnotes

- 1 The analysis of physician compensation is an update of earlier work performed on behalf of the Commission (for a description of the original analysis, see Berenson et al. 2010).
- 2 The primary care specialties in the analysis are family medicine, internal medicine, and general pediatrics.
- 3 To account for differences among specialties in hours worked per week, the contractor's earlier analysis for the Commission—with MGMA data for 2007—included comparisons of hourly compensation. The results were similar to those from the analysis of the 2010 data on annual compensation: hourly compensation for procedural specialties and radiology was more than double the hourly compensation rate for primary care. Analysis of hourly compensation was not possible with the 2010 data because the newer MGMA survey did not include questions about hours worked.
- 4 Fee schedule payments also include an estimate for practice expenses, but compensation, in the analysis discussed here, is calculated net of practice expenses.
- 5 The transitional care management code requires one face-to-face visit (not paid separately) as well as the non-face-to-face time required to deliver the transitional care.
- 6 The Protecting Access to Medicare Act of 2014 limited the funding that could be redistributed from overpriced services to the per beneficiary payment. The law set a target for reduced payments from overpriced services equal to 0.5 percent of fee schedule expenditures. If the target is not met in any one year—2017 through 2020—the savings from reduced payments for overpriced services will not be redistributed to all other services in the fee schedule as they would be otherwise. With this provision, the law claimed \$4 billion in savings over 10 years (2014–2024) to help fund a temporary (one-year) increase in fee schedule payment rates through March 31, 2015. This increase overrode a 24.1 percent reduction in rates that would have occurred on April 1, 2014, under the SGR formula.
- 7 The Protecting Access to Medicare Act of 2014 modified current policy. The law created the exception for any year in which the 0.5 percent target for savings from overpriced services is not met.
- 8 The RUC website is at <http://www.ama-assn.org/ama/pub/physician-resources/solutions-managing-your-practice/coding-billing-insurance/medicare/the-resource-based-relative-value-scale/the-rvs-update-committee.page>. The Commission's March 2006 report (http://medpac.gov/publications%5Ccongressional_reports%5CMar06_Ch03.pdf) also has a discussion.
- 9 In addition to RVUs for work, the fee schedule has RVUs for practice expense and for professional liability insurance.
- 10 Options for collecting the data were discussed in a 2012 Commission comment letter on CMS's proposed rule on the physician fee schedule (http://medpac.gov/documents/08312012_PartB_comment.pdf).
- 11 Methods for assessing the accuracy of time estimates are described in the Commission's 2012 comment letter on CMS's proposed rule on the physician fee schedule (http://medpac.gov/documents/08312012_PartB_comment.pdf).
- 12 The statutory requirement reads as follows: “the adjustments (to fee schedule RVUs) for a year may not cause the amount of expenditures under (the fee schedule) for the year to differ by more than \$20,000,000 from the amount of expenditures under (the fee schedule) that would have been made if such adjustments had not been made.”

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CHAPTER

6

**Site-neutral payments for select
conditions treated in inpatient
rehabilitation facilities and
skilled nursing facilities**

Site-neutral payments for select conditions treated in inpatient rehabilitation facilities and skilled nursing facilities

Chapter summary

Site-neutral payments reflect the Commission’s position that the program should not pay more for care in one setting than in another if the care can safely and effectively be provided in a lower cost setting. The Commission has examined inpatient and outpatient services for which the program pays different rates depending on the site of service and has made recommendations to lower or eliminate price differences.

In this chapter, the Commission focuses on site-neutral payment to post-acute care (PAC) facilities—namely inpatient rehabilitation facilities (IRFs) and skilled nursing facilities (SNFs)—that are paid under separate payment systems. The Commission compares payments for three conditions frequently treated in both settings. Because there is some overlap in the patients treated in both settings, yet payments can differ, there is an opportunity to develop site-neutral policies that eliminate unwarranted payment differences. The Commission is not alone in its interest in aligning payments between IRFs and SNFs. Since 2007, proposed budgets under presidents from both parties have included proposals to narrow prices between IRFs and SNFs for select conditions commonly treated in both settings.

The services typically offered in IRFs and SNFs differ in important ways. IRFs are required to meet the conditions of participation for acute care hospitals, including having more nursing resources available and having care

In this chapter

- Background on Medicare’s payments to IRFs and SNFs
- Possible conditions for site-neutral payments
- Similarity of patients treated in IRFs and SNFs
- Outcomes for patients with one of the three conditions are mixed, with risk-adjusted measures indicating small or no differences between IRFs and SNFs
- Impact of SNF payments on IRFs
- Options for waiving current IRF requirements
- Conclusion

supervised by a rehabilitation physician, among other requirements. Stays in IRFs are shorter on average, and patients in IRFs receive more intensive services, in part because patients admitted must be able to tolerate and benefit from an intensive therapy program. The Commission recognizes that the services in the two settings differ; however, we question whether the program should pay for these differences when the patients admitted and the outcomes they achieve are similar.

Using several criteria, we selected three conditions frequently treated in IRFs and SNFs—patients receiving rehabilitation therapy after a stroke, major joint replacement, and other hip and femur procedures (such as hip fractures)—and assessed the feasibility of paying IRFs the same rates as SNFs for these conditions. We examined the characteristics of patients admitted to SNFs and IRFs—including patients’ risk scores, ages, comorbidities, functional status at admission, predicted costs for therapy and nontherapy ancillary services (such as drugs), and shares of dual-eligible and minority beneficiaries—and did not find large differences in the patients with the orthopedic conditions. There were larger differences among the stroke patients. In general, SNF patients were more likely to have some characteristics that might raise their care needs (such as a history of falls or no sitting endurance), while IRF patients were more likely to have others (such as swallowing impairments or communication impairments).

We examined four outcome measures: hospital readmission rates, change in function (mobility and self-care), mortality rates, and spending in the 30 days after discharge from the SNF or IRF. Differences in outcomes between IRFs and SNFs were mixed: Risk-adjusted measures generally indicated small or no differences between the settings, while unadjusted measures showed larger differences between the settings. CMS’s Post-Acute Care Payment Reform Demonstration found no statistically significant differences between the sites in their risk-adjusted readmission rates, while IRFs had lower unadjusted readmission rates compared with SNFs for the three conditions. Regarding changes in function, IRFs and SNFs had similar risk-adjusted changes in mobility, but IRFs had greater improvement in patients’ self-care compared with patients treated in SNFs. The unadjusted mortality rates during the 30 days after discharge were higher for patients with the select conditions who went to SNFs compared with patients who went to IRFs. By condition (with no further risk adjustment), spending in the 30 days after discharge was higher for IRF patients than for SNF patients, due primarily to higher spending on other PAC services such as SNF and home health care.

For the three conditions, we compared Medicare’s IRF “base” payments in 2011 with what those payments would be if paid under SNF payment policy. Base payments exclude the “add-on” payments made to those IRFs that have a teaching

program, treat low-income patients, or have high-cost outlier cases. We found that if IRFs were paid under 2014 SNF policy, their aggregate payments for the three select conditions would decline. We also compared IRF base payments with those that would be made under the alternative SNF prospective payment system (PPS) design the Commission recommended in 2008 and found similar reductions to the IRFs' base payments. Under the policy design we explored, the industry-wide impact on total payments would be mitigated because IRFs would continue to receive IRF PPS payments for the majority of their cases and the site-neutral policy would not change the add-on payments many IRFs receive for the select conditions. The impact of this policy was consistent across different types of IRFs. Although certain types of providers have higher shares of site-neutral cases, they also tend to have higher add-on payments that dampen the impact of a site-neutral policy.

If payments for select conditions were the same for IRFs and SNFs, the Commission believes that CMS would need to evaluate waiving certain regulations for IRFs when treating site-neutral cases to level the playing field between IRFs and SNFs. For the site-neutral conditions, CMS could consider waiving requirements such as requiring that patients are able to tolerate and benefit from an intensive therapy program (often demonstrated by furnishing three hours of therapy a day) and receive frequent physician supervision (often satisfied by physician face-to-face visits at least three days a week). Waiving certain IRF regulations would allow IRFs the flexibility to function more like SNFs when treating those cases. Our examination also reinforces the Commission's concern that some of the definitions of cases meeting the IRF compliance thresholds are too broad.

Selecting three conditions to study allowed us to explore a "proof of concept" of site-neutral payments between IRFs and SNFs. We found that the patients and outcomes for the orthopedic conditions were similar and represent a strong starting point for a site-neutral policy. Patients receiving rehabilitation care after a stroke were more variable, and we conclude that additional work needs to be done to more narrowly define those cases that could be subject to a site-neutral policy and those that could be excluded from it. ■

Introduction

Medicare needs to shift its fee-for-service (FFS) payments toward integrated payment and delivery systems. New payment models, such as accountable care organizations (ACOs) and CMS's bundling initiatives, encourage providers to consider the most cost-effective site of post-acute care (PAC) to lower per episode or per beneficiary spending. At the same time, FFS methods remain important because they establish incentives (and disincentives) for providers, underlie many payment reforms, and will remain an option for providers and beneficiaries for the foreseeable future.

The Commission began its site-neutral payment inquiry with ambulatory services. In 2012, the Commission recommended that Medicare's payments for evaluation and management services (an "office visit") should be the same, regardless of whether the beneficiary was seen in the physician's office or in a hospital-based clinic (Medicare Payment Advisory Commission 2012). In 2014, the Commission expanded the concept of site-neutral payments to a set of 66 ambulatory services, and it recommended eliminating price differences for similar services and narrowing the prices paid for services with differences in the package of services covered by the payment (Medicare Payment Advisory Commission 2014). The Commission also applied the site-neutral concept to long-term care hospitals (LTCHs) and recommended that Medicare's payments to LTCHs should be the same as those made to acute care hospitals for patients who are not chronically critically ill (Medicare Payment Advisory Commission 2014).

Site-neutral payments stem from the Commission's position that the program should not pay more for care in one setting than in another if the care can be safely and efficiently (that is, at low cost and with high quality) provided in a lower cost setting. As a prudent purchaser protecting the taxpayers' and beneficiaries' interests, Medicare should base its payments on the resources needed to treat patients in the most efficient setting, adjusting for patient severity differences that could affect providers' costs.

This chapter explores the idea of applying the site-neutral concept to PAC services for conditions frequently treated in two PAC settings—inpatient rehabilitation facilities (IRF) and skilled nursing facilities (SNF). The Commission recognizes that the services in the two settings differ. The interdisciplinary focus and intensity of

services furnished in IRFs make them appropriate settings to treat patients with especially complex care needs, such as patients receiving rehabilitation care after severe strokes or brain or spinal cord injuries. However, the Commission questions whether the program should pay for differences in the intensity of services for those patients who appear to be similar to patients admitted to SNFs and who achieve similar outcomes.

We examine the possibility of paying IRFs the rates paid to SNFs when treating similar beneficiaries receiving services after a hospital stay. Eliminating the payment differences between the two settings represents a small step toward establishing payments across PAC settings based on patient characteristics rather than on where patients are treated. Beyond FFS, the findings could inform ACOs, Medicare Advantage (MA) plans, and private insurers about their enrollees' use of SNF and IRF services for the conditions we studied.

The Commission is not alone in its interest in rationalizing payments between IRFs and SNFs. Since 2007, proposed budgets under presidents from both parties have included proposals to narrow prices between IRFs and SNFs for select conditions commonly treated in both settings. In fiscal year 2015, the proposal calls for adjusting IRF payments for conditions involving hips and knees, pulmonary conditions, and any other conditions selected by the Secretary. CMS estimated this proposal would yield \$110 million in savings for 1 year and \$1.6 billion over 10 years.

To consider site-neutral payments between IRFs and SNFs, we selected three conditions, using the typology the Commission has applied in considering site-neutral payments in other settings (Medicare Payment Advisory Commission 2014, Medicare Payment Advisory Commission 2012)—patients receiving rehabilitation care after a stroke, major joint replacement, and other hip and femur procedures (such as hip fractures). We compared demographic and clinical characteristics of the patients treated in IRFs and SNFs to evaluate whether the patients were similar, compared the outcomes of the patients treated in each setting, estimated the impact on Medicare's payments to IRFs if they were paid SNF rates for these conditions, and estimated the impact on total IRF payments. Our analysis compares base payments to IRFs under three scenarios: 2014 IRF payment policy, payments if IRFs were paid the 2014 SNF prospective payment system (PPS) rates, and payments in 2014 if IRFs were paid under a MedPAC-recommended alternative SNF PPS design. The analysis does not consider changes to the additional payment adjustments that many IRFs

**TABLE
6-1**

Payments to IRFs were generally, but not always, higher than those to SNFs for select conditions in 2011

Condition (acute hospital MS-DRG)	SNF payment	Total IRF payment	Ratio of IRF to SNF payment	IRF base payment	Ratio of IRF base payment to SNF payment
Stroke with MCC (64)	\$15,627	\$22,159	1.42	\$19,897	1.27
Stroke with CC (65)	15,873	20,864	1.31	19,022	1.20
Stroke without CC (66)	13,788	18,300	1.33	16,866	1.22
Major joint replacement with MCC (469)	13,738	17,000	1.24	15,627	1.14
Major joint replacement without MCC (470)	9,843	13,821	1.40	12,936	1.31
Hip & femur procedures with MCC (480)	17,523	18,903	1.08	17,197	0.98
Hip & femur procedures with CC (481)	17,646	17,406	0.99	16,167	0.92
Hip & femur procedures without CC (482)	16,643	16,588	1.00	15,440	0.93

Note: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility), MS-DRG (Medicare severity–diagnosis related group), MCC (major complication or comorbidity), CC (complication or comorbidity). SNF payment and total IRF payment are program payments. Total IRF payments include the additional payments many IRFs receive for teaching programs, treating low-income patients, or having high-cost outlier cases. Base payments exclude the additional payments. Both IRF base payments and SNF payments include adjustments for the facility’s wage index and whether the facility is located in a rural area. Stays were assigned to SNFs or IRFs based on the first setting used, so a stay beginning in an IRF and subsequently going to a SNF would be considered an IRF stay. We excluded from our analysis SNF and IRF stays for beneficiaries who were enrolled in Medicare Advantage plans, who died during the IRF or SNF stay or within 30 days after discharge from either setting, or who stayed three or fewer days in the first post-acute care setting.

Source: Analysis of 2011 SNF and IRF Medicare Provider Analysis and Review data conducted for MedPAC by the Urban Institute.

receive for having a teaching program, treating low-income patients, and having high-cost outlier cases. In establishing the same payments for IRFs and SNFs for select conditions, the Commission also believes CMS should consider waiving some of the regulations for IRFs to level the playing field between IRFs and SNFs.

Background on Medicare’s payments to IRFs and SNFs

Medicare pays for patients admitted to SNFs on a per day basis. For the vast majority of days (over 90 percent), payments vary in large part by the amount of rehabilitation therapy a patient receives and a patient’s ability to perform activities of daily living.¹ The patient classification system uses a handful of diagnoses to assign days to resource utilization groups for medically complex patients.² There are no additional payments for facilities having a teaching program or treating low-income patients or high-cost outlier cases. Base payments to rural and urban facilities differ, and payments are adjusted for differences in wages across areas.

In contrast, for patients admitted to IRFs, Medicare pays on a per discharge basis. IRF patients are classified

into case-mix groups based on the patient’s relatively broad primary reason for rehabilitation care (e.g., stroke, neurological disorder, hip fracture), age, and level of functional impairment at admission.³ Within case-mix groups, patients are further categorized into one of four payment tiers based on the presence of certain comorbidities that have been identified as increasing the cost of care.⁴ Payments per discharge are adjusted for the facility’s wage index and whether the facility is located in a rural area. Unlike SNFs, IRFs may also qualify for additional payments per discharge—which we refer to as “add-on payments” here—for having a teaching program, treating low-income patients, or having high-cost outlier stays.⁵

IRFs must comply with the 60 percent rule, which requires that at least 60 percent of all cases an IRF admits have at least one of 13 conditions that CMS has determined to typically require intensive rehabilitation therapy.⁶ The intent of the 60 percent rule is to distinguish IRF care from acute hospital care, identifying patients who would benefit from this intensive rehabilitation setting. Cases can qualify based on the diagnosis codes for the primary condition or certain comorbidities. Stroke, hip fracture, and a subset of joint replacement conditions are among the 13 qualifying conditions. However, most of the clinical conditions are defined broadly. Of the 13 conditions, only hip and knee

**TABLE
6-2**

For the three selected conditions, stays in IRFs were much shorter than those in SNFs, 2011

Condition	Average length of stay (in days)	
	SNF	IRF
Stroke with CC	25	15
Major joint replacement without MCC	15	10
Hip & femur procedures with CC	32	14

Note: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility), CC (complication or comorbidity), MCC (major complication or comorbidity). The illustrative conditions were patients receiving rehabilitation care after stroke with CC (MS-DRG (Medicare severity–diagnosis related group) 65), major joint replacement without MCC (MS-DRG 470), and hip and femur procedures with CC (MS-DRG 481). Stays were assigned to SNFs or IRFs based on the first setting used, so a stay beginning in an IRF and subsequently going to a SNF would be considered an IRF stay. We excluded from our analysis SNF and IRF stays for beneficiaries who were enrolled in Medicare Advantage plans, who died during the IRF or SNF stay or within 30 days after discharge from either setting, or who stayed three or fewer days in the first post-acute care setting.

Source: Analysis of 2011 SNF and IRF Medicare Provider Analysis and Review data conducted for MedPAC by the Urban Institute.

replacement and arthritis categories detail specific clinical factors that limit which cases count toward the 60 percent rule (e.g., counting only joint replacements for patients who are over 85 years old or are obese or who underwent bilateral procedures).

Differences in Medicare payments to IRFs and SNFs for select conditions

To compare program spending for SNF and IRF care, we converted the day-based SNF payments to stay-based payments by summing the program’s payments across the SNF stay. We used Medicare severity–diagnosis related groups (MS-DRGs) to identify patients treated in IRFs and SNFs for similar conditions. In 2011, total Medicare payments (including the add-on payments made to many IRFs for teaching programs, share of low-income patients, and high-cost outlier cases) for three conditions commonly treated in IRFs and SNFs ranged from 42 percent higher in IRFs than SNFs for stroke with major complication or comorbidity (MCC) to about the same for hip and femur procedures (such as hip fracture) (Table 6-1). The differences were larger for some subgroups (not shown) of joint replacement patients, such as those receiving rehabilitation care after total hip replacement (47 percent higher) or knee replacement (49 percent).

The difference in payments for hip and femur procedures between IRFs and SNFs is small and reflects two factors. First, the average length of stay in SNFs for these patients is long (Table 6-2), which results in higher payments compared with payment rates for other SNF conditions. Second, patients receiving rehabilitation care after these

procedures in IRFs have low relative resource use and length of stay compared with other conditions, which results in lower IRF payment rates compared with rates for other IRF conditions, such as stroke. The combination of relatively high payments in SNFs and relatively low payments in IRFs leads to a narrow difference in payment for hip and femur procedures between the two settings.

Overall, the stays of beneficiaries treated in IRFs are much shorter than stays in SNFs (Table 6-2). Table 6-2 shows a comparison of stays for three MS-DRGs representing the select conditions, but these patterns hold across broader definitions of these conditions represented by the eight MS-DRGs displayed in Table 6-1.⁷ Differences in comorbidities (as measured by hierarchical condition category, or HCC, scores) would not fully explain these differences in lengths of stay (Table 6-5, p. 105). One study of joint replacement patients concluded that neither setting has a clear advantage regarding rehabilitation efficiency—the change in function per day and per payment (Tian et al. 2012). IRFs have length-of-stay efficiency that beneficiaries may prefer because they typically would be discharged sooner, while SNFs are typically paid less than IRFs, which payers may prefer.

SNFs and IRFs differ in the services they furnish

SNFs and IRFs differ in the mix of services they furnish. Compared with SNFs, IRFs have more extensive requirements regarding the amount of therapy and the frequency and level of medical supervision their patients receive. IRF patients are expected to tolerate and benefit

from intensive therapy, often demonstrated by IRFs furnishing at least two therapy modalities for three hours a day, five days a week. IRFs also must use a coordinated interdisciplinary team approach to care, led by a physician, and the rehabilitation services must be supervised by a rehabilitation physician through face-to-face visits at least three days a week. IRFs must also meet all conditions of participation for acute hospitals, including 24-hour nursing availability, and patients must meet medical necessity criteria.

In comparison, SNF patients assigned to the highest rehabilitation case-mix groups receive 720 or more minutes a week of therapy (2.4 hours for 5 days a week) and use one therapy modality 5 days per week and a second modality 3 days per week. Services in SNFs are not necessarily supervised by a rehabilitation physician, and registered nurses are not required to be onsite around the clock. SNFs are required to coordinate their care using interdisciplinary teams that include, but are not necessarily led by, physicians. For SNF stays to be covered by Medicare, physicians must certify at admission that the beneficiary requires daily skilled services. Re-certifications must also be done at day 14 and at least every 30 days thereafter, which nurse practitioners or physicians' assistants can conduct.

The differences in requirements by setting may affect referral patterns for patients with complex medical care needs. Patients who require additional nursing services (such as those with severe pressure ulcers, severe depression, incontinence, or swallowing impairments) or who require monitoring of lab values (such as those with anemia or diabetes) may be more likely to go to IRFs than SNFs. Yet at the same time, IRF patients' complexity cannot be so high that they cannot tolerate and be expected to benefit from an intensive therapy program. And, because facilities within a setting vary as much they do across settings, any given SNF or IRF may not have the capabilities to treat a patient's specific care needs.

Even if the capabilities of IRFs and SNFs vary, the services furnished to patients without complex medical and rehabilitation needs do not need to differ. If less-complex patients have comparable outcomes when treated in IRFs and SNFs, the intensive services furnished by an IRF may not be necessary for these patients. Furthermore, the fact that care does not need to differ suggests the need to refine payment policies, such as relaxing the IRF requirements for select conditions and equalizing Medicare's payments between settings.

Possible conditions for site-neutral payments

In examining site-neutral payments, the Commission's overarching principle is that Medicare should not pay substantially different prices for the same service or for treating similar patients. Instead, prices should be based on the lower cost setting when the patients appear to be similar and, where evidence exists, quality and outcomes appear to be similar. Across its work on site-neutral payments, the Commission has used several criteria to select services and conditions (see text box on selecting services and conditions for site-neutral payments, pp. 102–103). To select conditions for site-neutral payments between SNFs and IRFs, we considered IRF volume and spending, whether the conditions are frequently treated in SNFs, literature on the costs and outcomes of patients treated in both settings, the severity of patients treated in each setting, and whether the settings provide comparable units of service. Using these criteria, we selected three conditions for evaluating site-neutral payments between IRFs and SNFs: major joint replacement, stroke, and hip and femur procedures (including hip fracture).

We identified patients based on their MS–DRG from their preceding acute hospital stay. MS–DRGs were not used to establish payments for IRF or SNF stays, but they allowed us to identify patients receiving rehabilitation care for similar conditions in both settings. While the MS–DRG may not capture all of the factors relevant to a patient's rehabilitation and post-acute care needs (such as functional status), we used MS–DRGs to identify groups of patients that we then compared in more detail. Some patients' clinical conditions change between hospital discharge and admission to SNFs or IRFs, but most patients are admitted to each setting within a day of hospital discharge. We show only one MS–DRG per condition as a way to illustrate the issues raised and the possible impacts of a site-neutral payment policy, but note where results for a broader set of eight MS–DRGs covering the three conditions vary from the results we report. By focusing on three conditions, we can evaluate the feasibility of site-neutral payments between IRFs and SNFs, testing the “proof of concept.”

Volume and spending in IRFs

Conditions with the highest IRF volume and spending are major joint replacement without MCCs (MS–DRG 470),

**TABLE
6-3**

For the three selected conditions, a large share of stays were treated in SNFs, even in markets with IRFs, 2011

Condition	Percent treated in SNFs	
	All markets	Markets with both IRFs and SNFs
Stroke with CC	47%	33%
Major joint replacement without MCC	79	68
Hip & femur procedures with CC	75	63

Note: SNF (skilled nursing facility), IRF (inpatient rehabilitation facility), CC (complication or comorbidity), MCC (major complication or comorbidity). The illustrative conditions were patients receiving rehabilitation care after stroke with CC (MS-DRG (Medicare severity–diagnosis related group) 65), major joint replacement without MCC (MS-DRG 470), and hip and femur procedures with CC (MS-DRG 481). *Market* is defined as hospital service area. Stays were assigned to SNFs or IRFs based on the first setting used, so a stay beginning in an IRF and subsequently going to a SNF would be considered an IRF stay. We excluded from our analysis SNF and IRF stays for beneficiaries who were enrolled in Medicare Advantage plans, who died during the IRF or SNF stay or within 30 days after discharge from either setting, or who stayed three or fewer days in the first post-acute care setting.

Source: MedPAC analysis of IRF, SNF, and hospital claims 2011.

stroke with complications or comorbidities (CCs) (MS-DRG 65), and hip and femur procedures with CCs (MS-DRG 481). These three MS-DRGs account for about one-quarter of the more than 370,000 IRF stays and Medicare’s spending on IRF care. Broader definitions of these conditions—stroke defined by MS-DRGs 64–66, major joint replacement defined by MS-DRGs 469 and 470, and hip and femur procedures defined by MS-DRGs 480–482—were also studied. These eight MS-DRGs account for about one-third of all IRF volume and spending.

The conditions are frequently treated in SNFs

To ensure that the conditions can be appropriately treated in SNFs, we examined the share of cases treated in SNFs nationwide and in markets (defined as hospital service areas, or HSAs) with both SNFs and IRFs. Many markets do not have IRFs (only about one-quarter of HSAs have at least one IRF); therefore, SNFs far outnumber IRFs.⁸ Almost all HSAs with IRFs have at least one SNF. Our reasoning for examining markets with both types of facilities was that if a large share of patients elects to go to (or is referred to) SNFs even with an IRF in the market, then the condition can generally be treated in SNFs.

In 2011, across all markets, 47 percent of stroke patients, 79 percent of major joint replacements, and 75 percent of hip and femur procedures were treated in SNFs (Table 6-3). While the share of cases going to SNFs was smaller in markets with both types of facilities, one-third of stroke

patients and approximately two-thirds of the orthopedic cases were treated in SNFs in these markets, indicating that these conditions are frequently treated in SNFs—even in markets where an IRF is available as a potential treatment setting.

Regarding the three conditions captured across the eight MS-DRGs, we found that the shares of patients going to IRFs were higher for the MS-DRGs with CCs and lower for MS-DRGs with MCCs. This finding suggests that the patients with MCCs were less likely to be able to tolerate intensive therapy furnished in IRFs and were discharged elsewhere. Conversely, patients with a lesser CC for MS-DRG classification purposes could still meet the medical necessity requirements for IRF admission, such as a need for the nurse staffing or physician oversight present in IRFs or a need for intensive rehabilitation.

We note that current FFS utilization patterns do not necessarily reflect where patients would best receive their care at the lowest cost to the program for many reasons. Because there are typically no financial incentives for hospitals to refer patients to the most efficient or effective setting, discharge decisions are made using many criteria. Usually, the attending physician specifies the PAC setting most suitable to a patient’s care needs, and the discharge planner identifies a list of providers for the patient and family to consider. Placement decisions reflect the availability of PAC settings in a local market (whether there is an IRF or a SNF with an intensive rehabilitation program in the market) and the availability of beds. In addition, the hospital’s and family’s proximity

Selecting services and conditions for site-neutral payments

The Commission has examined site-neutral payment policies in inpatient and outpatient settings (Medicare Payment Advisory Commission 2014, Medicare Payment Advisory Commission 2012). Hospital outpatient departments are often paid more for furnishing ambulatory services than physician's offices furnishing the same services, long-term care hospitals (LTCHs) are paid more than acute care hospitals for treating patients who are not chronically critically ill, and inpatient rehabilitation facilities (IRFs) are often paid more than skilled nursing facilities (SNFs) for treating similar patients.

To select services or conditions for site-neutral payments, the Commission has used several criteria (Table 6-4). Of these, three criteria applied across all sectors: patients are frequently treated in the lower cost setting, indicating that setting is safe; patients have similar severity in the two settings; and the unit of service is comparable. The application of the other criteria varied slightly, in part because not all are relevant to all settings.

The criteria reviewed by the Commission are described more completely here:

- **Service is frequently furnished in the lower cost setting.** The Commission has used volume in the lower cost setting to indicate that the setting is safe for treating patients and that payments in the lower cost setting are adequate to ensure access to care. In considering whether patients can be safely treated in physicians' offices instead of hospital outpatient departments, the Commission examined ambulatory services that were furnished in physicians' offices over 50 percent of the time. In markets without IRFs and LTCHs, beneficiaries were treated in the lower cost settings—SNFs and acute care hospitals, respectively. In comparing IRFs and SNFs, we also evaluated the overall capacity of the SNF industry to treat patients with site-neutral conditions, in the event that the IRF industry elected to not admit these patients.

**TABLE
6-4**

Criteria used to select services or conditions for site-neutral payments

Criterion	Physician's office-hospital outpatient	LTCH-acute care hospitals	SNF-IRF
Patients frequently treated in lower cost setting	X	X	X
Patients have similar severity levels	X	X	X
Comparable unit of service	X	X	X
Literature on quality and outcomes	None identified	X	X
High volume/high Medicare spending in low-cost setting			X*
Service associated with emergency care	X	N/A	N/A
Low frequency of global surgical codes	X	N/A	N/A

Note: LTCH (long-term care hospital), SNF (skilled nursing facility), IRF (inpatient rehabilitation facility), N/A (not applicable).

*We used high volume/high Medicare spending to identify services to test the concept of site-neutral payments. If site-neutral policies were adopted, this criterion would not necessarily be required to identify services for broader implementation.

(continued next page)

to PAC providers, patient and family preferences, and the organizational relationships between providers play a role in patient placement (Buntin et al. 2005, Gage et al. 2008).

Medicare rules (conditions of participation and payment and coverage rules) provide some guidance regarding placement, but providers have considerable latitude in

terms of which patients they admit among the patients referred to them by hospitals. Medicare requires IRFs to have 60 percent of their cases represent 13 specific conditions that typically require intensive rehabilitation, and patients must require an intensive rehabilitation therapy program, which may be demonstrated by

Selecting services and conditions for site-neutral payments (cont.)

- **Patient severity.** In the analyses of ambulatory and IRF–SNF services, we compared the risk scores (based on the hierarchical condition categories) of beneficiaries treated in different settings to confirm that the patients’ health status was of similar severity (Medicare Payment Advisory Commission 2013). For example, a service was not selected if the average risk score for patients in hospital outpatient departments was higher than the average score for patients in physicians’ offices. In the LTCH work, we identified chronically critically ill conditions and excluded them from site-neutral payment policies.
- **Comparable service unit.** *Comparable units* refers to whether payment for the service in each setting covers the same services or includes a broader or narrower set of services compared with payment for other settings. Medicare’s payments to LTCHs, acute care hospitals, SNFs, and IRFs cover all services furnished to the beneficiary and therefore are considered to have comparable units of service.⁹ For ambulatory services, the Commission pursued two strategies because the level of “packaging” (grouping ancillary items and services with the primary service) differs by setting. In cases where the unit of payment in the hospital outpatient department includes more services than in the physician office, the Commission recommended narrowing, but not eliminating, the payment differences to account for these packaging differences.
- **Literature on quality and outcomes.** Literature comparing outcomes and quality factored into our consideration of site-neutral payments. It also helped identify conditions or characteristics suitable for a site-neutral policy, in terms of patients to include or exclude from the policy. No literature could be identified comparing the outcomes or quality of the ambulatory services studied by setting. As for services in LTCHs, numerous studies have been conducted and do not find a clear advantage for LTCH users, but are consistent in describing chronically critically ill patients—those most appropriate for LTCH care—as having high use of intensive care unit services. SNF–IRF literature is discussed on pp. 103–104.
- **High volume/high spending.** Conditions frequently treated in IRFs and with relatively high IRF spending were selected to test the concept of site-neutral payments to IRFs. Given the substantial CMS resources needed for policy implementation, we wanted to select conditions that constitute a sizable share of Medicare payments to this sector. If a site-neutral policy were adopted, conditions would not necessarily have to be high volume or account for substantial Medicare spending to be subject to a site-neutral payment policy.
- **Ambulatory service associated with emergency care.** Outpatient department services that are frequently performed on the same day as a visit to an emergency department may incur some of the costs associated with providing emergency care. Because physicians’ offices do not provide emergency care, we excluded these services from our site-neutral payment policy. This criterion was typically not relevant to the other sectors.
- **Low frequency of global surgical codes.** For ambulatory services, the costs of surgical services with 90-day global codes are generally assumed to be higher in hospitals compared with physicians’ offices. Therefore, services with 90-day global codes were considered not appropriate for site-neutral payments. This criterion was not relevant to the other settings. ■

furnishing three hours of therapy a day (often loosely referred to as the “three-hour” rule). Beneficiaries using SNFs must require skilled services (services furnished by skilled personnel such as registered nurses and physical therapists), but the amounts of service furnished vary considerably across patients.

Studies comparing IRFs and SNFs in terms of quality and outcomes

A final consideration in selecting conditions was the literature comparing costs and outcomes of patients treated in SNFs and IRFs. Studies have largely focused on patients recovering from strokes, joint replacement, and hip

fracture (Buntin et al. 2010, DeJong et al. 2009a, DeJong et al. 2009b, Deutsch et al. 2006, Deutsch et al. 2005, Herbold et al. 2011, Kane et al. 2000, Kane et al. 1998, Kramer et al. 1997, Mallinson et al. 2014, Mallinson et al. 2011, Munin et al. 2005, Walsh and Herbold 2006). The time periods covered by many of the studies predate the beginning of the IRF prospective payment system (PPS) and the enforcement of the 60 percent rule, which shifted the mix of patients treated in IRFs. A CMS-funded project concluded that many of the studies were of limited use because they did not adequately control for selection bias (Gage et al. 2009). Although statistical methods exist to control for unmeasured factors influencing site selection, they have not been widely used in studies of differences in outcomes between SNFs and IRFs. Studies are also limited in their consideration of potential differences in patient motivation and long-run recovery potential that can dramatically affect patient outcomes. More recent studies have included at least some controls for differences across patients, though it is hard to draw conclusions from them. Studies of other conditions typically do not compare outcomes across PAC sites, and when they do, they do not adequately control for the different mix of patients to draw conclusions about outcome differences (Gage et al. 2009).

In general, studies of stroke patients found that patients in IRFs had better outcomes than those in SNFs, though selection bias could have contributed to these findings (Buntin et al. 2010, Deutsch et al. 2006, Kane et al. 2000, Kane et al. 1998, Kramer et al. 1997). Studies of patients after joint replacement and hip fracture do not have consistent conclusions (Buntin et al. 2010, DeJong et al. 2009a, DeJong et al. 2009b, Deutsch et al. 2006, Deutsch et al. 2005, Herbold et al. 2011, Kane et al. 2000, Kane et al. 1998, Kramer et al. 1997, Mallinson et al. 2014, Mallinson et al. 2011, Munin et al. 2005, Walsh and Herbold 2006). In addition to selection bias, the ambiguous results suggest that reasonable treatment approaches may differ across beneficiaries. Some patients may be more appropriate for longer stays in less-intensive settings while others benefit from shorter, more-intensive therapy (Stineman and Chan 2009).

The CMS Post-Acute Care Payment Reform Demonstration (PAC-PRD) compared resource use and outcomes across the study's patients and conducted separate analyses of patients with musculoskeletal (including hip and knee replacement and hip fracture) and nervous system conditions (predominantly stroke cases) (Gage et al. 2011). In the demonstration, CMS successfully developed, validated, and tested a uniform

patient assessment tool (the Continuity Assessment Record and Evaluation, or CARE). This tool was used to gather consistently defined information about patients' functional status and about clinical and stay characteristics. The demonstration also collected data on patients' use of routine care (predominantly nursing) and rehabilitation therapy. With the data collected, the study could compare risk-adjusted patient outcomes and direct patient care costs, after controlling for many patient characteristics.

Similarity of patients treated in IRFs and SNFs

Establishing site-neutral payments between SNFs and IRFs would require that the patients treated in each setting be similar. Because IRF patients are expected to tolerate and benefit from an intensive therapy program, some medically complex patients are not admitted to this setting. Nevertheless, because IRFs are licensed as hospitals and must meet Medicare's conditions of participation, which include more physician and nursing presence, IRFs can manage patients who require the medical oversight not available in many SNFs (such as the administration of IV medications).

In our analyses, we identified cases that were discharged from acute care hospitals with the select MS-DRGs and that went to SNFs or IRFs within 30 days (though the vast majority of beneficiaries were admitted to the SNF or IRF within one or two days). Stays were assigned to SNFs or IRFs based on the first setting used, so a stay beginning in an IRF that subsequently went to a SNF would be considered an IRF stay. We excluded from most analyses SNF and IRF stays involving beneficiaries who were enrolled in MA plans, who died during the IRF or SNF stay or within 30 days of discharge from either setting, or who stayed three or fewer days in the first PAC setting. This last qualification helped ensure that cases that would qualify for IRF short-stay payments and their SNF equivalents were excluded. The analysis of mortality rates includes beneficiaries who died and excludes beneficiaries enrolled in MA. We did not narrow our examination to beneficiaries discharged to SNFs and assigned to the ultra-high rehabilitation case-mix groups because 40 percent of days for the three conditions were assigned to other rehabilitation case-mix groups. Had we limited the comparison to the days assigned to ultra-high case mix groups, we would have excluded this sizable share of stays from our comparisons of SNF and IRF patients.

**TABLE
6-5**

Characteristics of Medicare beneficiaries treated in IRFs and SNFs for three selected conditions were similar, 2011

Condition	Setting	Risk score	Age	Percent				
				Under 65 years old	85+ years old	Dual eligible	Minority	Female
Stroke with CC	SNF	1.8	81	5%	42%	28%	21%	65%
	IRF	1.5	76	11	24	22	22	55
Major joint replacement without MCC	SNF	1.3	76	7	18	15	11	74
	IRF	1.4	77	9	22	15	11	72
Hip & femur procedures with CC	SNF	1.7	83	4	50	21	8	79
	IRF	1.7	80	6	38	17	8	74

Note: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility), CC (complication or comorbidity), MCC (major complication or comorbidity). The illustrative conditions were patients receiving rehabilitation care after stroke with CC (MS-DRG (Medicare severity–diagnosis related group) 65), major joint replacement without MCC (MS-DRG 470), and hip and femur procedures with CC (MS-DRG 481). Risk score was measured by the beneficiary hierarchical condition category. Data shown are for SNFs and IRFs located in markets with both types of facilities. Stays were assigned to SNFs or IRFs based on the first setting used, so a stay beginning in an IRF and subsequently going to a SNF would be considered an IRF stay. We excluded from our analysis SNF and IRF stays for beneficiaries who were enrolled in Medicare Advantage plans, who died during the IRF or SNF stay or within 30 days after discharge from either setting, or who stayed three or fewer days in the first post-acute care setting. *Dual eligibles* are beneficiaries who qualify for Medicare and Medicaid.

Source: Analysis conducted by the Urban Institute of the 2011 denominator files, the 2011 hierarchical condition category risk scores, and 2011 Medicare Provider Analysis and Review data.

We compared patients admitted to IRFs and SNFs located in markets with both types of facilities, reasoning that such markets allow beneficiaries and clinicians to choose between PAC settings. With both options available, these markets allow us to better observe distinctions in the types of patients admitted to each setting. We note where findings for the markets with both types of facilities differ from findings for all markets. Our analyses were limited to administrative data routinely collected by CMS and to the data and findings of CMS’s PAC-PRD. These sources do not include some important determinants of outcomes, such as patient motivation or potential for long-term recovery.

We found considerable overlap in the patients receiving rehabilitation care after the orthopedic conditions treated in IRFs and SNFs and more variation in the stroke patients. Patients requiring rehabilitation after hip or knee replacements, which are generally elective procedures, were similar and indicate that a site-neutral policy could be implemented for these conditions. Given the greater heterogeneity of the stroke population, and considering that IRFs are the dominant treatment setting where both settings are available, more work needs to be done to delineate the types of stroke cases that would (and would not) be suitable for a site-neutral policy. Patients receiving rehabilitation therapy services after certain types of strokes or with particular comorbidities or functional impairments

may require 24-hour nursing, frequent physician oversight, or the intensive rehabilitation available in IRFs and would therefore likely be excluded from a site-neutral policy. Other stroke cases (such as those with a fairly predictable course of symptoms and treated according to generally accepted protocols) may be candidates for a site-neutral policy.

Risk scores and patient demographics

In markets with both types of facilities, we found considerable overlap in the demographic characteristics of patients treated for the three conditions (Table 6-5). The average beneficiary risk scores (as measured by the HCC model) across the three MS-DRGs were comparable between IRF and SNF patients. By condition, there were small differences in the risk scores, with SNFs’ stroke patients having higher risk scores and their orthopedic patients having lower scores. The distribution of the risk scores for IRF patients overlapped considerably with the distribution of scores for SNF patients. Across the three conditions, 77 percent of IRF patients had a risk score between the 10th and 90th percentiles of the distribution of risk scores for SNF patients.¹⁰ The overlap was smaller, though still considerable, for stroke patients (72 percent) than for the joint replacement and hip and femur procedures (82 percent and 74 percent, respectively).

**TABLE
6-6**

For the three selected conditions, patients treated in IRFs and SNFs had similar comorbidities, especially for the two orthopedic conditions, 2011

Comorbidity (HCC)	Stroke with CC		Major joint replacement without MCC		Hip and femur procedures with CC	
	SNF	IRF	SNF	IRF	SNF	IRF
Cardio-respiratory failure and shock	7%	5%	4%	4%	7%	6%
Chronic obstructive pulmonary disease	18	15	13	15	19	19
Congestive heart failure	26	20	13	15	22	20
Diabetes without complication	18	19	16	17	14	16
Heart arrhythmias	29	22	15	17	23	21
Major depressive, bipolar, and paranoid disorders	7	4	6	6	7	5
Polyneuropathy	10	9	8	10	9	10
Renal failure	19	15	11	12	17	15
Rheumatoid arthritis	6	6	9	10	7	8
Stroke (during previous year)	17	13	3	5	7	6
Vascular disease	25	19	16	18	24	20

Note: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility), CC (complication or comorbidity), MCC (major complication or comorbidity), HCC (hierarchical condition category). The three selected conditions are stroke with CC (Medicare severity–diagnosis related group [MS–DRG] 65), major joint replacement without MCC (MS–DRG 470), and hip and femur procedures with CC (MS–DRG 481). Polyneuropathy is nerve damage to peripheral nerves (beyond the brain and spinal cord) and can result from uncontrolled diabetes. Data shown are for SNFs and IRFs located in markets with both types of facilities. Stays were assigned to SNFs or IRFs based on the first setting used, so a stay beginning in an IRF and subsequently going to a SNF would be considered an IRF stay. We excluded from our analysis SNF and IRF stays for beneficiaries who were enrolled in Medicare Advantage plans, who died during the IRF or SNF stay or within 30 days after discharge from either setting, or who stayed three or fewer days in the first post-acute care setting.

Source: Analysis conducted by the Urban Institute of the 2011 Medicare risk score file.

There was similar overlap in the average risk scores for patients treated in SNFs and IRFs across all markets.

There were small differences in the demographics of the patients treated in IRFs and SNFs for the three conditions. SNF patients were older than IRF patients for two of the conditions (stroke and hip and femur procedures) and about the same age as IRF patients for major joint replacement. SNFs had a larger share of beneficiaries over 85 years old for two of the conditions (stroke and hip and femur procedures) and, across the three conditions, SNFs had a smaller share of beneficiaries under 65 years old. Nevertheless, there was considerable overlap in the distributions of the ages in the two settings. For these three conditions, 79 percent of IRF patients had ages between the 10th and 90th percentiles of the age distribution of SNF patients in all markets and in markets with both types of facilities. IRFs and SNFs had similar shares of dual-eligible and minority beneficiaries. SNFs had a higher share of female beneficiaries compared with IRFs.

We also compared the average risk scores and demographics of SNF patients in markets that included

both types of facilities with those of SNF patients in markets without an IRF. There were very small or no differences between the two sets of SNF patients.

For the broader set of conditions defined by the eight MS–DRGs, IRFs and SNFs exhibited risk-score patterns similar to those for the select conditions covered by the three MS–DRGs. Differences were larger in the risk scores for stroke patients than in the scores for patients with the orthopedic conditions. The overlaps in the SNF and IRF risk scores for the broader set of conditions were also similar to the scores for the three conditions, with 73 percent to 78 percent of IRF patients having a risk score between the 10th and 90th percentiles of SNF patients (depending on the condition). SNF beneficiaries were older on average, with fewer beneficiaries younger than 65 years old and more beneficiaries who were 85 years or older. There was considerable overlap in the age distributions, with 77 percent to 87 percent of IRF patients having ages between the 10th and 90th percentiles of SNF patients, depending on the condition. With respect to the shares of dual-eligible, minority, and female beneficiaries

**TABLE
6-7**

Differences in prior service use and functional impairment for all beneficiaries treated in IRFs and SNFs and assessed in CMS’s Post-Acute Payment Reform Demonstration

Prior service use and patient impairments	Percent of patients admitted to:	
	IRFs	SNFs
Prior service use		
History of falls	46%	52%
Acute hospital claim within past two months	3	9
At least seven days in an intensive care unit in prior hospital stay	1	3
Functional impairment		
Bladder incontinence	41	36
Indwelling catheter	5	3
Swallowing signs and symptoms	11	6
No sitting endurance	41	45
Communication moderately or severely impaired	40	31
Temporal orientation moderately or severely impaired	18	28

Note: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility). Results are for all patients treated in IRFs and SNFs and included in CMS’s Post-Acute Care Payment Reform Demonstration. *Temporal impairment* indicates whether patients have difficulty knowing the month or year, and if so, whether they can correctly identify the season, staff members’ faces or names, or where they are located (e.g., in a nursing home).

Source: Gage et al. 2011.

for the broader set of conditions, IRFs and SNFs exhibited similar patterns to those for the three select conditions.

Comorbidities and other patient characteristics

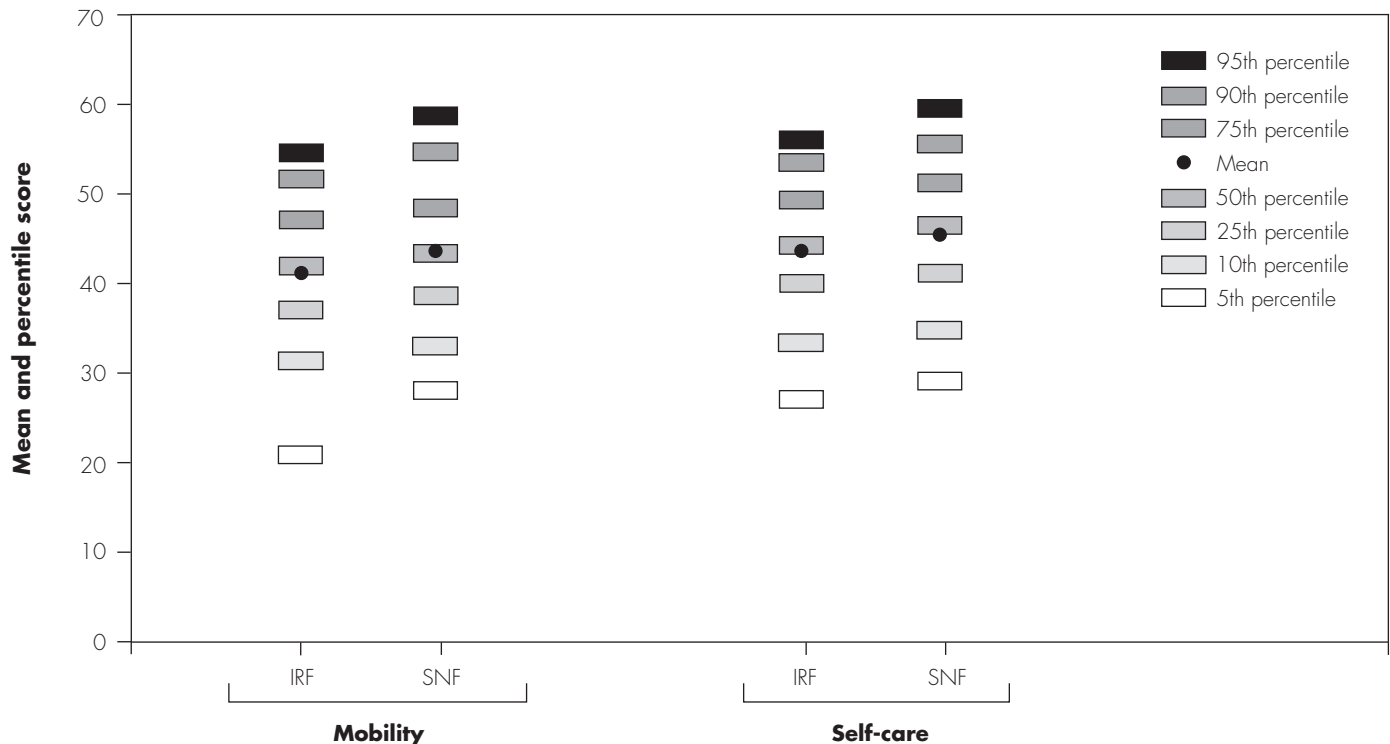
We examined comorbidities and other patient characteristics as another point of comparison between IRF and SNF patients. For the three conditions selected, we compared comorbidities using HCCs, which are based on the patients’ claims history from the prior year and thus capture acute and chronic conditions during that year. For the orthopedic conditions, the prevalence of the HCCs was very similar, with patients treated in IRFs and SNFs differing by one or two percentage points (Table 6-6). There were larger differences in the prevalence of the comorbidities between patients treated in IRFs and SNFs with stroke conditions. The higher prevalence of comorbidities of SNF patients may reflect that the patients could not tolerate the intensive therapy required for IRF admission. The results were consistent across markets with both types of facilities, all markets, and markets without IRFs. Across the broader set of conditions, the comorbidities of patients treated in IRFs and SNFs were similar, especially for the orthopedic conditions.

We also examined differences in patients’ prior use of services and functional impairment from data gathered in CMS’s PAC demonstration because these characteristics either are not recorded in the SNF and IRF patient assessments or are not consistently defined. The demonstration collected patient information over three years, from March 2008 through 2010, for 6,054 admissions to SNFs and 7,380 admissions to IRFs (Gage et al. 2011). Much of the data predate the regulations CMS implemented in 2010 that clarified medical necessity requirements for IRF admissions. Although these requirements could have changed the mix of patients admitted to IRFs, our analysis of IRF admissions over time suggests the policies did not produce lasting changes in the IRF patient population. In fact, growth in case-mix complexity slowed slightly after 2010, increasing an average 0.7 percent each year from 2010 through 2012, compared with 1.1 percent each year from 2008 through 2010.

These data show some differences between IRF and SNF patients in their prior service use and impairments (Table 6-7). Across all patients evaluated (not just patients with the three selected conditions), patients in IRFs were more likely to have bladder incontinence, signs and symptoms

FIGURE 6-1

At facilities participating in CMS's Post-Acute Care Payment Reform Demonstration, mobility and self-care function of patients at admission to IRFs and SNFs were similar



Note: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility). Data for the Post-Acute Care Payment Reform Demonstration include 6,054 admissions to SNFs and 7,380 admissions to IRFs between March 2008 and December 2010.

Source: Gage et al. 2011.

related to swallowing, and moderate or severe impairment in communicating. Conversely, patients admitted to SNFs were more likely than patients admitted to IRFs to have had a history of falls, an acute hospitalization within the previous two months, no sitting endurance, and moderately or severely impaired temporal orientation. Some conditions, such as dementia, could impair a beneficiary's ability to tolerate or follow instructions of an intensive therapy regime, so these patients may be more appropriate for SNF care. Characteristics that shape a patient's care needs could be used to delineate (or exclude) conditions for site-neutral payment.

Functional status at admission

CMS's PAC demonstration also allows for the comparison of functional status at admission to SNFs and IRFs because a common patient assessment instrument was used in both settings. Across all patients admitted to

participating facilities (not only for the select conditions), the functional status (as measured by mobility and self-care) of all patients at admission shows considerable overlap (Figure 6-1).¹¹ The mean scores for mobility and self-care are within one point, although patients admitted to IRFs have slightly lower scores at each percentile shown. These results suggest that the functional status of IRF and SNF patients are similar overall.

Predicted nontherapy ancillary and therapy costs

In our work to redesign the SNF PPS to establish payments based on patient characteristics, we developed models to predict patients' nontherapy ancillary (NTA) (such as drugs) and therapy costs. Because these predicted costs reflect differences across patients' ages, comorbidities, and functional status at admission, we used them as predictors of patients' care needs. We found

SNF patients had lower relative predicted costs for NTA and therapy services compared with patients treated in IRFs. However, there was substantial overlap in the SNF and IRF distributions for predicted NTA costs, with 78 percent of IRF patients falling between the 10th and 90th percentiles of the SNF distribution of predicted NTA costs. One might expect less overlap in the distributions of predicted therapy costs because IRFs have intensive therapy requirements while SNFs face payment ceilings at 720 minutes of therapy per week. In fact, there was less (though still considerable) overlap in the two distributions for predicted therapy costs (on average, 73 percent of the IRF patients' predicted costs were between the 10th and 90th percentiles of the SNF distribution). These findings held across patients treated in IRFs and SNFs in all markets.

For the broader set of conditions, IRFs and SNFs exhibited similar cost patterns to those for the three select conditions. IRFs had higher average predicted therapy and NTA costs compared with SNF patients. There was considerable overlap in the predicted NTA cost distributions and less overlap in the predicted therapy costs, particularly for the hip and femur procedures.

Predicted probability of patients going to IRFs or SNFs based on their characteristics

Another way to assess the similarity of the patients who go to SNFs and IRFs is to see how well the setting that a patient went to can be predicted based on a patient's clinical conditions and demographics. If we cannot reasonably predict whether acute patients discharged from acute hospitals will be admitted to an IRF or a SNF, then the low predictability is an indication that the patients are similar. However, if such a prediction can be made accurately, then the level of predictability indicates that the two settings differ in their patients' clinical conditions and demographics. Patients with comorbidities associated with a much lower probability of admission to a SNF might be considered inappropriate for site-neutral payments.

We estimated the probability of a patient going to a SNF in markets with both SNFs and IRFs, using a patient's comorbidities measured before the stay (their HCCs and a subset of hospital diagnoses) and age. Generally, about two-thirds of orthopedic patients are admitted to SNFs and one-third are admitted to IRFs. For patients with the orthopedic conditions, the regression models had little ability to predict whether a patient would go to a SNF, indicating relatively few differences across settings in

the patients admitted to each setting.¹² Reflecting the overlap in patients going to both settings, IRF and SNF patients had similar probabilities of going to a SNF. Major joint replacement patients who went to IRFs had an average predicted probability of 67 percent of going to SNFs compared with a 69 percent probability for patients who went to SNFs. Hip and femur procedure patients who went to IRFs had a 60 percent probability of going to a SNF compared with a 64 percent chance for SNF patients. In addition to similar average probabilities, the distributions of the probabilities were also similar between patients who went to an IRF or a SNF.

There appear to be more distinctions between the two settings for stroke patients compared with the orthopedic conditions. Overall, one-third of stroke patients go to SNFs; two-thirds go to IRFs. The model was slightly better able to predict patients going to a SNF.¹³ Stroke patients who went to IRFs had a predicted probability of 30 percent of going to a SNF, compared with a predicted probability of 38 percent for patients who went to SNFs. Because systematic differences in stroke patients across settings could reflect that patients with certain comorbidities are more likely to use SNFs (conditions that may prevent their ability to tolerate IRFs' intensive therapy requirements), we also examined a model that excluded characteristics associated with higher SNF use. This second model included only patient characteristics associated with a higher likelihood of treatment in IRFs (i.e., the characteristics that could potentially flag cases where IRF care is most appropriate). This model had little ability to predict use of SNF versus IRF, suggesting that patients in the two settings are similar with respect to the conditions that are likely to raise the probability of using an IRF.¹⁴

We also considered the probabilities of discharged hospital patients going to a SNF or an IRF, using diagnoses measured at admission to these post-acute facilities. We found larger differences between SNF and IRF patients, but were unable to distinguish whether the patients differed or whether facilities differed in their coding practices. The two PPSs differ considerably in how extensively they use clinical conditions to establish payments. While IRF payments increase with the presence of one or more of over 900 comorbidities for almost any patient, only a handful of conditions are used in the SNF PPS, and none are used to adjust payments for the almost 90 percent of days assigned to rehabilitation-only case-mix groups.

**TABLE
6-8**

SNFs had higher unadjusted readmission rates compared with IRFs for the three selected conditions, 2011

Condition	IRFs in markets with IRFs and SNFs	All SNFs	SNFs in markets with IRFs and SNFs	SNFs in markets without IRFs
Stroke with CC	11.1%	15.3%	15.6%	15.0%
Major joint replacement without MCC	6.1	6.6	6.4	6.8
Hip & femur procedures with CC	8.4	11.3	11.4	11.1

Note: SNF (skilled nursing facility), IRF (inpatient rehabilitation facility), CC (complication or comorbidity), MCC (major complication or comorbidity). The illustrative conditions were patients receiving rehabilitation care after stroke with CC (MS-DRG (Medicare severity–diagnosis related group) 65), major joint replacement without MCC (MS-DRG 470), and hip and femur procedures with CC (MS-DRG 481). All readmissions were defined using CMS’s definition of hospital-wide unplanned readmission measure and excluded planned readmissions. Readmissions were counted if they occurred during the stay or within 30 days of discharge from the IRF or SNF. *Market* is defined as the hospital service area. Readmission rates for IRFs in all markets were the same as those for markets with both IRFs and SNFs because there are only four IRFs in markets without a SNF. Stays were assigned to SNFs or IRFs based on the first setting used, so a stay beginning in an IRF and subsequently going to a SNF would be considered an IRF stay. We excluded from our analysis SNF and IRF stays for beneficiaries who were enrolled in Medicare Advantage plans, who died during the IRF or SNF stay or within 30 days after discharge from either setting, or who stayed three or fewer days in the first post-acute care setting.

Source: MedPAC analysis of IRF, SNF, and hospital claims 2011.

Outcomes for patients with one of the three conditions are mixed, with risk-adjusted measures indicating small or no differences between IRFs and SNFs

For patients with one of the select conditions, we compared four outcomes for SNFs and IRFs: hospital readmission rates, changes in functional status, mortality rates, and total Medicare spending during the 30 days after discharge from the qualifying stay. The comparisons yielded mixed results. Differences in unadjusted readmission rates for patients treated in IRFs and SNFs were effectively eliminated with risk adjustment. Risk-adjusted differences in improvement in self-care were larger for patients treated in IRFs compared with patients treated in SNFs, but there were not statistically significant differences between the two settings for changes in mobility. Observed mortality rates were higher for patients treated in SNFs compared with patients treated in IRFs. Finally, Medicare spending during the 30 days after discharge from IRFs was higher compared with discharge from SNFs.

Readmission rates

For the three selected conditions, we compared observed hospital readmissions rates (excluding planned readmissions) for stays in IRFs and SNFs, and for the 30 days after discharge from either setting. We did not risk adjust the rates (although the rates were tallied

by condition, not across conditions) because uniform patient assessment information was not available. SNFs had higher observed readmission rates compared with IRFs, especially for two conditions (Table 6-8). The differences in observed rates were similar for the broader definitions of the conditions. Within the joint replacement group, IRFs and SNFs had similar readmission rates for patients after total hip and knee replacements (with IRFs having slightly higher rates), but SNFs had considerably higher readmission rates for patients after partial hip replacements compared with IRFs. Readmission rates for SNFs in all markets, in markets with IRFs and SNFs, and in markets without IRFs were similar.¹⁵

The PAC-PRD compared risk-adjusted readmission rates using the common assessment data collected with the CARE tool. The rates were adjusted for differences in patient age, diagnoses and comorbidities, major treatments received (such as total parenteral nutrition or ventilator), cognitive status, presence of wounds, and functional status (Gage et al. 2011). Across all conditions, including the three in our analyses, the risk-adjusted rates of rehospitalization did not differ significantly between the two settings. The study also conducted separate analyses of patients hospitalized for musculoskeletal conditions (including major joint replacement and hip and femur procedures) and nervous system conditions (including stroke).¹⁶ It did not find statistically significant differences in risk-adjusted readmission rates between the two settings for either group.

**TABLE
6-9**

For the three selected conditions, SNF and IRF observed mortality rates were comparable during stays, but higher in SNFs in the 30 days after discharge, 2011

Condition	Setting	Mortality rate	
		During stay	30 days after discharge
Stroke with CC	IRFs in markets with IRFs and SNFs	0.0%	4.4%
	SNFs in markets with IRFs and SNFs	0.1	17.0
	All SNFs	0.1	17.0
Major joint replacement without MCC	IRFs in markets with IRFs and SNFs	0.0	0.9
	SNFs in markets with IRFs and SNFs	0.3	2.1
	All SNFs	0.3	2.2
Hip & femur procedures with CC	IRFs in markets with IRFs and SNFs	0.0	2.6
	SNFs in markets with IRFs and SNFs	0.1	9.3
	All SNFs	0.1	9.2

Note: SNF (skilled nursing facility), IRF (inpatient rehabilitation facility), CC (complication or comorbidity), MCC (major complication or comorbidity). The illustrative conditions were patients receiving rehabilitation care after stroke with CC (MS-DRG (Medicare severity–diagnosis related group) 65), major joint replacement without MCC (MS-DRG 470), and hip and femur procedures with CC (MS-DRG 481). Mortality rates are not risk adjusted and may not reflect differences in patient risk profiles. Stays were assigned to SNFs or IRFs based on the first setting used, so a stay beginning in an IRF and subsequently going to a SNF would be considered an IRF stay. SNF and IRF stays for beneficiaries enrolled in Medicare Advantage plans were excluded.

Source: MedPAC analysis of 2011 Medicare Provider Analysis and Review and denominator files.

Changes in function

The PAC–PRD study also reported changes in self-care and mobility during the patients’ PAC stay across all conditions (not just the select three in this chapter), controlling for selection bias using the demographic and clinical covariates (Gage et al. 2011). The risk-adjusted rate of improvement in mobility function (for example, walking or transferring between bed and chair) did not vary significantly between the two sites. For self-care function (e.g., eating, hygiene, and dressing), patients in IRFs had higher risk-adjusted rates of improvement that were statistically significant than patients in SNFs, but the thresholds for defining differences that were clinically meaningful were not determined. The authors cautioned that there may be unmeasured differences in patient severity and rehabilitation potential. In addition, the risk adjustment model did not consider differences across patients in their motivation and engagement and in treatment objectives.

The PAC–PRD study conducted separate analyses of patients who were hospitalized for musculoskeletal conditions (including elective hip and knee replacement and hip fracture) and nervous system conditions.¹⁷ In the musculoskeletal group, it did not find statistically

meaningful differences in risk-adjusted changes in mobility or self-care. In the nervous system group, the study did not find statistically significant differences in the risk-adjusted changes in mobility, but found that patients treated in IRFs had larger gains in self-care. The study did not establish thresholds for defining clinically meaningful differences in changes in function for the nervous system group.

Mortality rates

In markets with IRFs and SNFs, the unadjusted mortality rates were similar during the IRF and SNF stays but considerably higher for SNFs in the 30-day period after discharge (Table 6-9). Deaths that occurred during any readmission to an acute care hospital were included in the 30-day measure. The differences in mortality rates for stroke patients may partly reflect differences in risk scores, age, and comorbidities of patients treated in SNFs and IRFs. Given the higher risk scores for stroke patients treated in SNFs, risk-adjusted mortality rates of stroke patients treated in IRFs and SNFs are likely to be more similar, though differences in rates would likely remain. The rates for SNFs in all markets were almost identical to the rates for SNFs in markets with both IRFs and SNFs. A separate industry-sponsored study reported differences in IRF and SNF mortality rates during the two years after

**TABLE
6-10**

Medicare spending in 30 days after discharge from IRFs was higher than spending after SNF stays for the three selected conditions, 2011

Condition	Discharged from	30-day after discharge spending				Initial IRF or SNF stay plus 30-day spending
		Total	Additional PAC	Readmission	Physician and other	
Stroke with CC	IRF	\$13,931	\$10,456	\$2,212	\$1,262	\$35,146
	SNF	12,318	7,305	3,582	1,431	28,476
Major joint replacement without MCC	IRF	6,775	4,709	1,205	861	21,022
	SNF	5,339	3,234	1,280	825	15,104
Hip & femur procedures with CC	IRF	12,459	9,549	1,861	1,049	30,576
	SNF	10,298	6,387	2,731	1,180	28,194

Note: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility), PAC (post-acute care), CC (complication or comorbidity), MCC (major complication or comorbidity). The illustrative conditions were patients receiving rehabilitation care after stroke with CC (MS-DRG (Medicare severity–diagnosis related group) 65), major joint replacement without MCC (MS-DRG 470), and hip and femur procedures with CC (MS-DRG 481). Additional PAC use can include home health care or additional IRF or SNF care, including care after a hospital readmission. Readmissions include readmissions to an acute care hospital for any reason. Physician and other services include outpatient therapy, physician, hospice, and other Part B services (such as lab services). Program payments to IRFs include payments for having a teaching program, treating low-income patients, or having high-cost outliers. Stays were assigned to SNFs or IRFs based on the first setting used, so a stay beginning in an IRF and subsequently going to a SNF would be considered an IRF stay. We excluded from our analysis SNF and IRF stays for beneficiaries who were enrolled in Medicare Advantage plans, who died during the IRF or SNF stay or within 30 days after discharge from either setting, or who stayed three or fewer days in the first post-acute care setting. Data are for IRFs and SNFs located in markets with both types of facilities.

Source: MedPAC analysis of 2011 Medicare Provider Analysis and Review data.

discharge (DaVanzo et al. 2014). For similar patients, it found SNFs had higher mortality rates compared with IRFs, although completely adjusting for differences in patients is difficult.

Spending during the 30 days after discharge from an IRF or SNF

We examined total Medicare spending during the 30 days after discharge from the IRF and SNF stays and found that patients treated in IRFs had higher spending in the 30 days after discharge from the IRF compared with patients treated in SNFs. The spending in the 30-day period included total program payments for hospital readmissions, additional PAC (such as home health care or IRF or SNF care after a hospital readmission), physician services, outpatient therapy, hospice, and other Part B services (such as lab tests). Across markets with both types of facilities, spending for the three conditions during the 30-day period for IRFs ranged from 13 percent to 27 percent higher than spending for SNFs (Table 6-10). The spending associated with the use of a second (or more) PAC service averaged 46 percent higher for IRFs compared with SNF patients, perhaps due to beneficiaries’ shorter stays but continued need for rehabilitation. Across

IRF stays, subsequent SNF use made up almost two-thirds of the PAC spending in the 30 days after discharge from the IRF for stroke and joint replacement patients. Across SNF stays, second SNF use made up 60 percent of subsequent PAC use for stroke and hip and femur procedure patients. Home health agency spending made up most of the remaining PAC spending.

IRF spending on readmissions was considerably lower compared with SNFs for two of the conditions (stroke and hip and femur procedures), reflecting the lower readmission rates for IRF patients. Spending for physician and other Part B services (such as outpatient therapy) made up between 12 percent and 15 percent of the 30-day spending in both settings and was consistently higher in SNFs. When the 30-day spending was combined with the spending on the initial IRF stay, total program spending for IRF patients ranged from 8 percent to 39 percent higher compared with SNF patients, depending on the condition.

Across all markets, the 30-day spending patterns were almost identical to those in markets with both types of facilities. Spending during the 30 days after discharge ranged from 17 percent to 26 percent higher for IRF stays compared with SNF stays. Differences in PAC spending

were slightly larger (49 percent higher in IRFs), while spending on readmissions was the same. Combining the spending on the initial PAC stay with the 30-day spending, IRF stays ranged from 9 percent higher (for hip and femur procedures) to 38 percent higher (for major joint replacement). For SNFs in markets without IRFs, spending—for the initial SNF stay and the 30 days after discharge from the SNF—was very similar to spending for SNF stays in markets with IRFs.

For the broader definitions of the conditions, IRFs and SNFs had similar spending patterns. During the 30 days after discharge, IRFs had higher PAC spending and lower spending on readmissions. Together with the initial IRF stay, patients who used IRFs had higher combined spending (the initial PAC stay plus the 30 days).

Impact of SNF payments on IRFs

To assess the impact of paying IRFs the same rates that SNFs would be paid for the select conditions, we calculated the average differences in payment for each condition and estimated their impacts at the facility level. We compared payments to IRFs under current (2014) IRF policy with two SNF scenarios: payments using the current (2014) SNF PPS and payments under the alternative SNF PPS design recommended by the Commission (Medicare Payment Advisory Commission 2008). Each patient's comorbidities, impairments, and functional status were used to adjust payments according to the current SNF PPS policies and the alternative PPS design. We estimated payments to IRFs if the alternative PPS design for SNFs were adopted because the Commission has long criticized the SNF PPS for encouraging the provision of rehabilitation therapy and poorly targeting payments for NTA services such as drugs (Medicare Payment Advisory Commission 2014, Medicare Payment Advisory Commission 2008). Under the Commission's alternative design, payments to SNFs for rehabilitation therapy services would be based on patient and stay characteristics, not the amount of therapy furnished to beneficiaries (Carter et al. 2012, Garrett and Wissoker 2008). Payments would be higher for patients who, due to their clinical conditions and impairments, require more therapy services, and payments would be better targeted to patients with high NTA care needs.

For the conditions we examined, both SNF payment scenarios would result in a substantial decrease in IRF payment per discharge for stroke and hip and knee

replacement and an increase in payment for hip and femur procedures. However, these case-level changes result in relatively modest decreases in payment at the facility level (about a 4 percent decrease in payment for the three conditions), largely because the cases represent a minority of the total number of IRF cases. We assumed that site-neutral payments would not change the add-on payments many IRFs receive for having a teaching program, treating low-income patients, and having high-cost outlier cases, which, in our analysis, also mitigated total payment impacts at the facility level (see text box, p. 115, on estimating the impact of SNF payments on payments to IRFs).

Impact of SNF payments for the three conditions

For the conditions we examined, both SNF payment scenarios would result in a substantial decrease in payment for stroke and hip and knee replacement and an increase in payment for hip and femur procedures (Table 6-11, p. 114). Under current SNF payment policy for 2014, payment for IRF discharges would decrease by about 22 percent for stroke (MS-DRG 65) and 23 percent for major joint replacement without MCC (MS-DRG 470), while payments would increase by about 5 percent for hip and femur procedures (MS-DRG 481). The impacts under the MedPAC-recommended SNF alternative design were similar to those for current SNF policy (see text box, pp. 116–117, on estimating SNF payments under an alternative PPS design).

Impacts on IRF payment rates were fairly consistent across the broader definitions of the conditions. For example, payments for major joint replacement without MCC (MS-DRG 470) decreased under current SNF policy by 23 percent and by 19 percent for major joint replacement with MCC (MS-DRG 469).

Impact of site-neutral payments on total IRF payments

We estimated the total financial impact on IRFs of site-neutral payments for our select conditions, using the per discharge payment differences. Because the site-neutral policy affects only base payments, the estimates assume IRFs would continue to receive add-on payments at the same levels for the cases paid under a site-neutral policy. We also did not factor in any changes to IRFs' patient admission practices in response to the policy or changes in the 30-day spending in the 30 days after discharge from the IRF.

We estimated the financial impact on IRFs of site-neutral payments for the three conditions—stroke with

**TABLE
6-11**

Estimated impact of paying 2014 discharge-adjusted SNF payment rates to IRFs for the three selected conditions examined

Condition	Payment rate per IRF discharge			Impact on per discharge payment	
	IRF payment rate	SNF current policy	SNF alternative design	SNF current policy	SNF alternative design
Stroke with CC	\$22,391	\$17,440	\$17,321	-22%	-23%
Major joint replacement without MCC	14,648	11,218	12,206	-23	-17
Hip & femur procedures with CC	18,774	19,788	20,298	5	8

Note: SNF (skilled nursing facility), IRF (inpatient rehabilitation facility), CC (complication or comorbidity), MCC (major complication or comorbidity). The illustrative conditions were patients receiving rehabilitation care after stroke with CC (MS-DRG (Medicare severity–diagnosis related group) 65), major joint replacement without MCC (MS-DRG 470), and hip and femur procedures with CC (MS-DRG 481). The average SNF length of stay by condition was used to convert the day-based payments to discharge-based payments. IRF payments do not include additional payments for having a teaching program, treating low-income patients, or having high-cost outlier stays. Stays were assigned to SNFs or IRFs based on the first setting used, so a stay beginning in an IRF and subsequently going to a SNF would be considered an IRF stay. We excluded from our analysis SNF and IRF stays for beneficiaries who were enrolled in Medicare Advantage plans, who died during the IRF or SNF stay or within 30 days after discharge from either setting, or who stayed three or fewer days in the first post-acute care setting.

Source: Analysis conducted by the Urban Institute for MedPAC.

CC, major joint replacement without MCC, and hip and femur procedures with CC (MS-DRGs 65, 470, and 481, respectively). Paying SNF rates under current SNF PPS policy (2014 base rates and 2014 relative weights) for these three conditions would decrease Medicare payments to IRFs by roughly \$300 million, or 4 percent lower total IRF payments. This net impact is the result of decreasing payments for stroke by \$140 million, decreasing payments for major joint replacement by \$180 million, and increasing payments for hip and femur procedures by \$20 million. The IRF payment reductions associated with stroke would be lower if only a subset of stroke cases were eligible for site-neutral payments. Total payment reductions under the MedPAC-recommended SNF alternative model are lower, at about \$240 million.

The second estimate considers a broader definition of these conditions—cases identified with the eight MS-DRGs (64, 65, 66, 480, 481, 482, 469, and 470). Under current SNF PPS policy in 2014, program spending would decrease by about \$415 million, or decrease total IRF payments by 5 percent. Total payment impacts under the MedPAC-recommended SNF alternative model are smaller, at about \$345 million.

Overall, the impact of site-neutral payments on total IRF revenue appears similar across provider types. Nonprofit, for-profit, hospital-based, and freestanding IRFs had Medicare payments decrease by about 4 percent under

site-neutral payments for the three conditions. Site-neutral payments would reduce total base payments slightly more for nonprofit and hospital-based facilities compared with for-profit and freestanding facilities because the former have higher shares of patients with the three conditions. However, we assumed a site-neutral policy would not change add-on payments, which typically add about 9 percent to all IRF base payments on average. Nonprofit and hospital-based facilities receive more of these payments, which lessen the total financial impact of site-neutral payment policy for them. Essentially, while these providers have larger shares of patients with the select conditions, add-on payments make up a larger share of total revenue for these providers and would not be affected by the policy.

Policymakers could consider identifying cases for site-neutral payments, using a combination of the IRF classification of cases and the hospital-assigned MS-DRG classification. Recall that we have used MS-DRGs from the preceding acute hospital stay to identify and compare patients treated in IRFs and SNFs for similar conditions (but neither IRFs nor SNFs use MS-DRGs for payment purposes). The strength of using hospital-assigned MS-DRGs is that the assignment of the condition would be separate from the provider of PAC service (and any payment incentives a PAC provider might have regarding coding of the condition). Considering the IRF classification in addition to the

Estimating the impact of site-neutral payments to inpatient rehabilitation facilities

To estimate the difference in payment at the case level, we compared base payments to inpatient rehabilitation facilities (IRFs) under current (2014) IRF policy with the two skilled nursing facility (SNF) payment scenarios. We adjusted base payments for the provider's wage index and rural status according to the respective IRF and SNF payment policies. We assumed that a site-neutral policy would not affect the add-on payments to IRFs, and therefore, we did not consider them in our comparisons at the case level. We used 2014 IRF prospective payment system (PPS) payment rates for the case-mix group (CMG) and tier of each case and the 2011 case counts and mix of conditions. Because each condition was associated with a wide distribution of IRF CMGs, we estimated a weighted-average IRF payment based on the distribution of cases across CMGs (weighted by the number of patients with each CMG).

To calculate SNF payments to IRFs, we converted the SNF day-based payment into a stay-based payment, using the average length of stay in SNFs by condition. This approach establishes IRF payments equal to those made to SNFs, basing the IRF payment on the average payment made to SNFs by condition. We subdivided major joint replacement cases into total hip, partial hip, and knee replacement because the lengths of stay are considerably different. To calculate stay-based payments to SNFs, we summed the day-based payments across the stay.

To estimate the total financial impacts of site-neutral payments on IRFs in 2014, we estimated payments under the IRF PPS for all IRF cases and added or subtracted the impact of paying IRFs the SNF rates for the number of cases with the select conditions (added payments associated with hip and femur procedures and subtracted reductions to payments for stroke and major joint replacement cases). We used 2014 IRF PPS payment rates and 2011 case counts and mix of conditions.

To estimate payments for all IRF cases, we estimated total base payments (adjusting for provider wage index and rural status), using 2014 IRF PPS payment rates for the CMG and tier of each case. We increased the aggregate adjusted base payments by 9 percent for add-on payments, reflecting the 2011 share that the payments for having teaching programs, treating low-income patients, and having high-cost outliers added to Medicare base payments to IRFs. We did not preserve the additional payments rural IRFs receive as an add-on payment here because the SNF PPS has its own rural adjustment (separate urban and rural base rates), so IRF compensation for rural status would be included in the SNF payment rates for these cases. To estimate the number of select-condition cases in the IRF, we used 2011 hospital claims with the relevant diagnosis related groups and with IRFs as the discharge destination. To estimate the impact of paying SNF rates to IRFs for the select conditions, we multiplied this count by the average calculated payment for each condition under the IRF and SNF PPSs. ■

preceding MS-DRG should be explored to ensure similar rates are paid for patients with similar care needs.

Considerations for implementing a site-neutral policy

To implement a site-neutral policy, CMS would retain the IRF PPS, along with the current SNF PPS (or the MedPAC-recommended alternative SNF PPS). For each site-neutral case treated in an IRF, the base rate would be calculated using a SNF PPS, while the case's add-on payments for teaching program status, share of low-income patients, and high-cost outliers would be calculated on the IRF base rate. For the cases in the IRF that are not affected by the site-neutral policy, payment

would continue to be calculated according to the IRF PPS. Policymakers would need to decide whether to adopt site-neutral policies for conditions for which the SNF stay-based payments are higher.

One issue for consideration is whether the relative weights associated with IRF case-mix groups should be recalibrated to ensure that payments in aggregate do not increase as a result of a site-neutral policy and waived regulations. If certain regulations were waived for site-neutral conditions, IRF costs associated with treating these conditions may fall. In the absence of other changes, a decrease in IRF costs for these conditions would result in an increase in the relative weights for non-site-neutral conditions, which would in turn result in higher payment

Estimating skilled nursing facility payments under the alternative prospective payment system design

To estimate payments to skilled nursing facilities (SNFs) under the Commission’s alternative design, we began with an alternative design developed by researchers at the Urban Institute (Garrett and Wissoker 2008, Wissoker and Garrett 2014). These designs estimate therapy and nontherapy ancillary (NTA) service costs for each patient’s stay using data from the patient assessments, SNF claims, and SNF cost reports. The design uses a mix of patient and stay characteristics to predict therapy and NTA costs; nursing payments were based on the current prospective payment system (PPS). Payments for therapy and NTA services varied based on a patient’s age, the use of special services (such as intravenous medications or ventilator care), indicators of mental and cognitive status, ability to perform activities of daily living, and 20 categories of diagnoses and an HIV indicator (Table 6-12). The design also includes characteristics of the stay: whether the patient was assigned to a rehabilitation case-mix group and a proxy for length of stay (see note to Table 6-12 for more detail).

Separate Poisson regression models (to reflect the skewed distribution of costs) were developed to predict per day NTA and therapy costs using characteristics of the patient and the stay. Although the NTA and therapy models use the same predictors, the coefficients (the direction and magnitude of a predictor’s effect on costs) are often different. For example, the impact of intravenous therapy as a predictor differed between NTA and therapy costs per day—increasing predicted NTA costs per day and decreasing predicted therapy costs per day. Using separate regression models allows the predictor to adjust NTA costs upward and therapy costs downward. Some characteristics (such as keeping patients in bed or tube-feeding patients) were excluded because their inclusion in a payment component could create inappropriate incentives for providers to augment payments.

The nursing component of the 2014 SNF PPS was used to establish payments for nursing services.¹⁸ To establish the NTA “pool” of payments, we subtracted the average share of NTA costs of the nursing costs from the nursing component. Per day payments for NTA services were estimated using patient and stay characteristics.

**TABLE
6-12**

Patient and stay characteristics used to predict NTA and therapy costs in alternative SNF PPS design

Patient characteristics

- Age
- Special services: IV medication, respiratory care, chemotherapy, hospice care
- Physical and mental health status: Infection, serious skin ulcer, nursing case-mix index, incontinence, and mental and cognitive function
- Ability to perform activities of daily living: mobility and self-care measures
- Diagnoses (20 categories) and an HIV indicator

Stay characteristics

- Indicator the patient was assigned to any rehabilitation case-mix group
- Length of stay proxy

Notes: NTA (nontherapy ancillary), SNF (skilled nursing facility), PPS (prospective payment system), IV (intravenous). We assumed patients treated in inpatient rehabilitation facilities would be assigned into an ultra-high rehabilitation case-mix group. *Respiratory care* indicates oxygen (linked to specific conditions), tracheostomy care, or ventilator care. A length of stay proxy (instead of the actual length of stay) was used so that the model could be adopted for determining payments to a SNF. Many SNFs bill Medicare periodically, rather than at the end of the stay. When a SNF filed a claim, it would not know the final stay length, but it would know which patient assessment (the 5-day, the 14-day, etc.) had been completed for the patient.

Source: Analyses prepared for MedPAC by the Urban Institute, 2014.

(continued next page)

Estimating skilled nursing facility payments under the alternative prospective payment system design (cont.)

We created a proxy for per discharge payment by summing the day-based payments for each day of the stay. The aggregate SNF payments under the alternative design were assumed to equal those under current policy.

Because the alternative design was to be used to estimate payments to IRFs, the predictive models had to be revised in minor ways to accommodate differences in the data collected by IRFs and SNFs. For example, whether a patient had difficulty swallowing helps predict cost per day, but the questions in the assessments are sufficiently different that this patient characteristic was not included in the updated model. The function items were built from relevant questions in the IRF–Patient Assessment Instrument, and a crosswalk to the Minimum Data Set assessments for nursing homes put the items on the same scale (Mallinson et al. 2012). Because the patient assessments used in each setting include different questions regarding cognition and incontinence, we approximated these patient abilities using prescription drug hierarchical condition categories and diagnostic information from the SNF claims and IRF patient assessment instrument.

We assumed all IRF stays would be classified into one of the ultra-high SNF case-mix groups and used the IRF patient assessments to estimate the activities of daily living. To be consistent with IRF payment policy, which has a short-stay outlier policy to pay for unusually short stays, we excluded SNF stays of three or fewer days from the model estimation and simulations. We also excluded patients who died during the qualifying stays or within 30 days of discharge so that these results could be compared with our other analyses.

Compared with SNF 2014 policy, the alternative SNF PPS design explains considerably more of the variation across SNF stays in NTA costs and the same amount of the variation in therapy costs. At the stay level, current SNF PPS policy explains none of the variation in NTA costs, while the alternative design explains 19.5 percent. Regarding therapy services, the current PPS policy explains 19.4 percent of the variation in therapy costs compared with 19 percent by the alternative design. The alternative design would result in much more targeted payments for NTA services and equally accurate payments for therapy while removing the incentive to furnish therapy as a way to boost payments.

Another measure of the performance of the SNF alternative design is whether it results in payments that are proportional to costs at the facility level. A case-mix index (CMI) coefficient measures the proportionality of payments to costs. A value of 1.0 indicates payments would be equal to costs. A value less than 1.0 indicates that facilities with above-average costs would be overpaid and facilities with below-average costs would be underpaid. A value greater than 1.0 indicates that as costs increase, payments do not keep pace, resulting in underpayment for facilities with a relatively high-cost case mix. Current policy results in systematic overpayments for NTA and therapy services for facilities with an above-average case mix and underpayment for facilities with a below-average case mix (CMI coefficient of 0.08 for NTA services and a CMI coefficient of 0.42 for therapy services). In contrast, the alternative design results in nearly proportional payments for NTA services (CMI coefficient = 0.93) and far more proportional payments for therapy services (CMI coefficient = 1.11). ■

levels for the non-site-neutral conditions. While payment levels for the site-neutral conditions would be held at SNF levels, policymakers should consider whether payment levels for non-site-neutral conditions should be allowed to rise as a result of waived regulations for the site-neutral conditions. All things being equal, increase in the weights of non-site-neutral conditions would offset payment reductions. The Commission will be considering strategies to address this issue.

If implemented, a common set of patient assessment information would facilitate comparing quality of care and outcomes of patients treated in both settings. In March 2014, the Commission recommended a starting set of items for all PAC providers to report. This set, along with diagnosis data from inpatient hospital claims, would allow us to risk adjust and compare outcome measures (including changes in self-care and mobility, readmission rates, and mortality rates) and costs.

It is not known how IRF patient mix and volume would change in response to a site-neutral policy. When confronted with changes to the compliance thresholds, IRF patient volume declined overall, and IRFs shifted their mix of patients away from conditions that no longer counted toward the thresholds (Medicare Payment Advisory Commission 2014). It is possible that IRFs would again adjust their mix of cases, toward cases paid under the IRF PPS, with site-neutral cases shifted to SNFs. If IRFs no longer admitted cases subject to site-neutral payments, one question is whether the SNF industry has adequate capacity to treat these cases. Although average nursing facility occupancy rates are relatively high (84 percent), the additional volume for the three site-neutral conditions is relatively small. We estimate that the average SNF occupancy rates would increase less than 1 percentage point, though rates would vary by market and could make accessing a SNF bed more difficult in markets with even higher occupancy rates. However, in certain markets, patients with conditions paid under a site-neutral policy could face a more narrow choice of PAC options if IRFs opted to no longer admit them.

Alternatively, IRFs may elect to continue to treat the cases subject to the site-neutral policy but receive lower payments. Even with lower payments, the cases may still be profitable for some IRFs, may still cover the facility's fixed costs (and be better than an empty bed), or may improve total hospital margins in the case of hospital-based IRFs. Because IRFs may change the mix of services, therapy intensity, and length of stays for cases paid under a site-neutral policy, it will be important to monitor outcomes and the quality of care furnished to these patients.

A facility's willingness to admit site-neutral cases may also depend on other factors, such as how quickly a facility can modify its variable costs. Some variable costs, such as the amount of rehabilitation a patient receives or the number of face-to-face physician visits, would be relatively easy to modify. Other factors, such as the level and mix of staffing, may be easier to implement in larger facilities that could adjust their staffing for an entire nursing unit. In addition, market characteristics, such as the presence of other IRFs or SNFs with specialized capabilities to treat IRF-compliant cases, would affect an IRF's ability to shift its patient mix toward cases not affected by a site-neutral policy. IRFs located in markets without competitors might be more able to shift their mix of patients toward patients with conditions that the average

SNF is not staffed or equipped to manage, such as patients receiving rehabilitation care for burns or traumatic brain injury.

Cost sharing could increase for some beneficiaries whose conditions are paid under a site-neutral policy. Beneficiaries transferred to an IRF from an acute care hospital pay no additional deductible but are responsible for a copayment (\$296 a day in 2013) for the 61st through 90th days.¹⁹ Under SNF payment rules, beneficiaries are responsible for a daily copayment (\$152 a day) beginning on day 21 of the stay. Beneficiaries whose stays exceeded 20 days would be responsible for the copayments for days beyond day 20. However, most beneficiaries have some form of supplemental coverage that may cover the SNF and IRF copayments.

Options for waiving current IRF requirements

If site-neutral payments for select PAC conditions were implemented, the Commission believes CMS should consider waiving some of the IRF regulations for those case types, thus leveling the playing field with respect to regulatory requirements. Otherwise, IRFs would continue to be subject to requirements that raise their costs—such as the frequency of physician supervision and providing an intensive therapy program—yet be paid as SNFs. CMS could consider waiving regulations that apply to individual cases, which would be easier to implement than requirements that apply to the entire facility. For example, the coverage criteria that patients must require supervision by a rehabilitation physician (satisfied by physician face-to-face visits at least three days a week) could be waived for individual patients. Waiving certain IRF regulations for select conditions would allow IRFs to function more like SNFs in treating those conditions. IRFs could choose to provide less intensive therapy or medical care for individual patients, based on the patients' particular needs. For example, IRFs could have more flexibility to provide fewer than three hours of therapy each day or to vary the number of physician face-to-face visits each week, as IRF clinicians deemed necessary. Waiving requirements would prevent Medicare's administrative contractors from denying claims for care that did not meet IRF requirements. Medicare would need to carefully monitor outcomes (such as readmissions and improvement in functional status) to ensure that quality of care was not eroded.

The illustrative site-neutral payment policy highlights one shortcoming of the 60 percent threshold requirement—that many of the conditions are too broadly defined. The 60 percent rule (formerly 75 percent rule) was established to distinguish IRFs from inpatient acute hospitals. A case that is paid a SNF rate because it does not require IRF-level care should not, at the same time, be counted toward meeting the threshold designed to ensure that IRFs treat a minimum number of patients who require IRF care. One option in considering the calculation of the compliance threshold would be to exempt the site-neutral conditions that currently count toward the 60 percent threshold—stroke and hip fracture MS-DRG cases and a subset of joint replacement cases—from the calculation.

Another option would be to lower the threshold while more narrowly defining the qualifying conditions to identify cases that require IRF-level care. The Commission has commented before that more refined criteria are needed to identify patients appropriate for IRFs (Medicare Payment Advisory Commission 2013). Lowering the threshold while tightening the qualifying criteria could enable IRFs to have more flexibility in their patient mix while better ensuring that they serve the most appropriate patients. The criteria have already narrowly defined the subset of hip and knee replacement cases and arthritis conditions that count toward the 60 percent rule. For hip and knee replacement cases, only patients with bilateral procedures, who have a body mass index ≥ 50 , or are age 85 or older count toward compliance; other joint replacement cases do not. There are likely similar subsets of stroke and hip fracture patients who are more appropriate for IRF-level care. For example, all stroke cases currently count toward the compliance threshold, regardless of whether the patient is severely impaired or has no paralysis. Cases with specific characteristics that require IRF-level care, such as certain medical complexities or particular rehabilitation needs, could potentially be exempted from site-neutral payments and qualify toward the compliance threshold.

There is considerable industry interest in providing high-intensity rehabilitation without the IRF regulatory requirements. One company has developed SNF facilities with intensive medical and rehabilitation care capabilities that it markets to MA plans as able to deliver IRF-level care at rates that are lower than IRF payments. Some large SNF chains have developed intensive units focused on the rehabilitation and recovery of high-acuity, short-stay patients. The IRF industry has supported testing a provider model that

could provide a range of rehabilitation and medical needs without IRF requirements. In this “continuing care hospital,” payments would be based on patient characteristics rather than different setting-specific payments.

Conclusion

This analysis evaluates paying SNF rates to IRFs when treating conditions treated in both IRFs and SNFs. While a few IRF conditions, such as burns, spinal cord injury, or traumatic brain injury, may typically require hospital-level care, many other conditions—particularly other conditions not counted in the 60 percent threshold and subsets of the 13 qualifying conditions—may be appropriate for care in a SNF. These other conditions may ultimately be appropriate for site-neutral payments. This approach is consistent with the incentives of ACOs and MA plans to consider the lowest cost setting where patients can be appropriately treated.

Selecting a handful of conditions to study allowed us to examine the concept of site-neutral payments between IRFs and SNFs. We found that the patients and risk-adjusted outcomes for the orthopedic conditions were similar and represent a strong starting point for a site-neutral policy. Patients receiving rehabilitation services after a stroke were more variable, and more work needs to be done to narrow the definition of cases that require IRF-level care. Waiving certain IRF rules for the conditions selected would allow IRFs to vary the services they furnish to patients and put them on equal footing with SNFs.

Site-neutral payments can be an important building block in establishing payments across PAC settings based on patient characteristics, rather than where patients are treated. Just as the PAC-PRD concluded that a common payment system may be possible for patients who could appropriately be treated in different settings, we found that the SNF PPS, especially an alternative design, could be used to pay IRFs treating similar patients. Even if estimated savings are modest, the approach begins the process of considering a common payment system across PAC settings.

The Commission will continue to explore site-neutral payments between SNFs and IRFs. These considerations may include narrower definitions of stroke cases and exploring other conditions that lend themselves to this policy. ■

Endnotes

- 1 For more information, see the Commission's *SNF Payment Basics* document at http://www.medpac.gov/documents/MedPAC_Payment_Basics_13_SNF.pdf.
- 2 Days assigned to a case-mix group that considers diagnoses or special service use (such as ventilator or tracheostomy care) account for less than 10 percent of SNF days.
- 3 There are five special case-mix groups for patients discharged before the fourth day (short-stay outliers) and for those few who die during their stay.
- 4 The first and highest paid tier includes codes for comorbidities associated with renal dialysis, tracheostomy, and paralysis of vocal cords. The codes in the second tier are related to difficulty swallowing and certain infections. The third tier includes a variety of comorbidities associated with over 900 International Classification of Diseases, Ninth Revision, Clinical Modification codes, including paralysis, pneumonia, morbid obesity, and a range of infections. The fourth tier is for patients with no comorbidities associated with higher costs of care.
- 5 For more information, see the Commission's *IRF Payment Basics* document at http://www.medpac.gov/documents/MedPAC_Payment_Basics_13_IRF.pdf.
- 6 The 13 qualifying conditions are stroke; spinal cord injury; congenital deformity; amputation; major multiple trauma; hip fracture; brain injury; neurological disorders; burns; three arthritis conditions for which appropriate, aggressive, and sustained outpatient therapy has failed; and hip or knee replacement when bilateral, when body mass index ≥ 50 , or when patient is age 85 or older.
- 7 While the stays of beneficiaries treated in IRFs are much shorter than stays in freestanding SNFs, they are more comparable to stays in hospital-based SNFs. Hospital-based SNFs represent 5 percent of SNF facilities (Medicare Payment Advisory Commission 2014). Previous work done by the Commission found that patients who used hospital-based units were younger and had a lower severity of illness (Medicare Payment Advisory Commission 2007). Although patients admitted to hospital-based SNFs had shorter stays, their use of a second PAC service was higher and a lower share of patients was discharged home compared with patients discharged to freestanding SNFs.
- 8 The majority of beneficiaries (69 percent) live in HSAs with at least one IRF.
- 9 Although Medicare pays SNFs on a day basis and IRFs on a discharge basis, the units can be considered comparable because both include all services furnished during their stays.
- 10 By definition, 80 percent of SNF patients fall between the 10th and 90th percentiles.
- 11 CMS's contractor developed standardized measures of self-care and mobility using items that ranged from 0 (*most dependent/lowest functional status*) to 100 (*completely independent/highest functional status*).
- 12 The R^2 values were 2 percent for joint replacement cases and 3 percent for hip and femur procedures.
- 13 The R^2 value was 6 percent for stroke cases.
- 14 The R^2 value was 0.2 percent.
- 15 Because there are only four IRFs in markets without SNFs, the readmission rates for IRFs in markets with both types of facilities are the same as the rates for all markets.
- 16 In the analysis of readmission rates, minor surgical procedures (including hip fracture) and major surgical procedures (including major joint replacement) made up 71 percent of the musculoskeletal group. Stroke patients made up just over half (52 percent) of the nervous system group.
- 17 In the analysis of changes in function, major and minor surgical procedures made up 68 percent of the musculoskeletal group, and stroke patients made up 47 percent of the nervous system group.
- 18 To estimate payments under the alternative design, we modified the nursing relative weights in 2014 to remove the effects of the policy decision to lower the nursing weights for select case-mix groups when CMS corrected the payment rates in 2012 (White 2013). In 2012, CMS differentially lowered rates across the case-mix groups as a way to shift payments from rehabilitation case-mix groups to clinically complex and special care case-mix groups. In estimating 2014 payments for the alternative design, we lowered the 2012 nursing weights for all case-mix groups by the amount CMS estimated the adjustment should have been before differentially adjusting payments across case-mix groups (Centers for Medicare & Medicaid Services 2012). For estimating current SNF payments, we used the current policy's nursing relative weights.
- 19 Beneficiaries admitted from the community were responsible for a deductible of \$1,184 in 2013. Almost all IRF patients (95 percent) are admitted to an IRF directly from an acute care hospital.

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CHAPTER

7

**Measuring the effects of
medication adherence for the
Medicare population**

Measuring the effects of medication adherence for the Medicare population

Chapter summary

Medication adherence is viewed as an important component in the treatment of many medical conditions. Adherence to appropriate medication therapy can improve health outcomes and has the potential to reduce the use of other health care services. At the same time, improved adherence increases spending on medications. This issue has led to a proliferation of research on policies that encourage better adherence to medication therapy (e.g., reduced patient cost sharing) and the impact of improved medication adherence on health outcomes, typically measured by the use of other health care services.

Literature on medication adherence has found numerous policy interventions that can improve medication adherence. However, only a subset of these interventions relates better adherence to better health outcomes, patient satisfaction, and health care use and costs. Further, the long-term consequences are still uncertain (Goldman et al. 2007, Viswanathan et al. 2012).

This study builds on the analysis we conducted last year examining the relationship between adherence to medications and the use of medical services by Medicare beneficiaries with selected conditions. Our preliminary findings showed that the effects on Medicare spending of better adherence to medication therapies likely vary across medical conditions, medication regimens, and low-income subsidy (LIS) status. This variability suggests that

In this chapter

- Cohort selection
- Assignment of adherence levels
- Analytical approach
- Estimated effects of medication adherence
- Discussion

the results were not generalizable. Our findings also suggest that the reductions in spending we observed for the conditions we examined may not all have been attributable to improved adherence to medication therapies.

In this chapter, we examine how changes in cohort definitions and model specifications affect the estimated effects on medical spending from adhering to a medication therapy for Medicare beneficiaries with congestive heart failure (CHF).

The results of our analysis show the following:

- Better adherence to an evidence-based CHF medication regimen is associated with lower medical spending among Medicare beneficiaries with CHF, but the effects likely vary by beneficiary characteristics (e.g., age).
- Beneficiaries who follow the recommended CHF therapies tend to be healthier before being diagnosed with CHF than nonadherent beneficiaries, with fewer medical conditions and lower medical spending.
- The estimated effects of medication adherence on medical spending are highly sensitive to specifications in the estimation model. For example, including survivor status in the model reduced the effect on health care spending by half. The magnitude of the effect is also sensitive to how we define the adherent versus nonadherent population, and the criteria used to select the study cohort.
- The effects of medication adherence diminish over time.

Although our analysis examined only one condition (CHF) and is therefore not generalizable to other conditions or populations, the study findings highlight the difficulty in interpreting estimates of the effects of medication adherence as measured by spending differentials between adherent and nonadherent individuals. The difficulty may be exacerbated by the more-complex health profiles of the Medicare population compared with the general population often used in studies of medication adherence. ■

Background

Medication adherence is viewed as an important component of the treatment of many medical conditions. Adherence to appropriate medication therapy can improve health outcomes and has the potential to reduce the use of other health care services. At the same time, improved adherence increases spending on medications. This issue has led to a proliferation of research on policies that encourage better adherence to medication therapy (e.g., reduced patient cost sharing) and the impact of improved medication adherence on health outcomes, typically measured by the use of other health care services.

Literature on medication adherence finds numerous policy interventions that can improve medication adherence. However, only a subset of these policy interventions relates better adherence to better health outcomes, patient satisfaction, and health care use and costs. Further, the long-term consequences are still uncertain (Goldman et al. 2007, Viswanathan et al. 2012).

Studies that focus on individuals with certain chronic conditions have found that adhering to evidence-based medication therapy reduces the incidence of hospitalizations and emergency room visits (Goldman et al. 2007, Roebuck et al. 2011, Sokol et al. 2005). After reviewing recent research, the Congressional Budget Office (CBO) concluded that policies that change the cost-sharing structure of the Part D benefit probably affect federal spending on medical services. CBO plans to include medical spending offsets in future policy proposals that increase or decrease the use of prescription drugs covered under Part D (Congressional Budget Office 2012).

At the same time, there is a research gap in understanding the impact of improved medication adherence on health outcomes (Viswanathan et al. 2012). For example, there is lack of uniformity in how medication adherence is measured across studies. With adherence to most medication therapies decaying over time (typically within one year), the long-term effects of policies that encourage medication adherence are uncertain at best. Although experts generally agree that poor adherence to medications is a widespread phenomenon, the specific causes and solutions to the problem are less clear (Madden et al. 2008, Osterberg and Blaschke 2005, Schoenthaler et al. 2012, Viswanathan et al. 2012). CBO also points out that the effect of medication adherence on one of the key health outcomes—the mortality rate—has

not been well established, which could have important implications for estimating the budgetary effects of policy proposals that change the use of medications covered under the Part D benefit.

Preliminary findings from our own research show that the effects of better adherence to medication therapies on health outcomes as measured by Medicare spending vary across medical conditions, medication regimens, and low-income subsidy (LIS) status (Medicare Payment Advisory Commission 2013). For example, our estimates suggest that improved adherence among the least adherent beneficiaries with congestive heart failure (CHF) could result in lower medical spending, ranging from about \$860 to more than \$2,500 per beneficiary per year.¹ For other conditions, such as depression, we found almost no effects or an increase in Medicare spending from improved adherence. This variability in our findings across conditions, drug regimens, and populations suggests that the results are not generalizable and that the effects of improved adherence likely differ by medical condition, patient characteristics, and drug regimen.

Our findings also raise questions about whether the estimated effects could be confounded by factors unrelated to beneficiaries' medication-taking behavior that also affect their health. For example, we found that the effects on condition-specific costs (i.e., costs directly related to the condition being treated by study medications) accounted for relatively small portions of the overall effects for many of the study cohorts. In the case of beneficiaries with chronic obstructive pulmonary disease (COPD), medication costs for treating the condition exceeded the reductions in COPD-specific costs. We had anticipated that if medication adherence reduces expenditures on other health care services, it does so by affecting the condition targeted by the study drugs. We also found that a greater improvement in adherence did not necessarily result in a larger spending reduction compared with a more modest improvement in adherence.

Other findings raised questions about the validity of the methodology we used (and is often used by other studies) to define comparison groups based on observed level of adherence. A closer examination of individuals classified as adherent versus nonadherent revealed that some beneficiaries classified as having low adherence were often adherent to the study medications before experiencing medical events (typically inpatient admissions). We also found that some individuals were

switched to different study medication(s) during the observation period after some medical event, causing them to be classified as having low adherence even though they were adherent to the study medication(s) before the switch and may have continued to follow the new medication regimen after the switch.

As policymakers contemplate interventions to improve medication adherence, we need a better understanding of how medication adherence affects health outcomes and health care use for Medicare beneficiaries. Although not directly addressed in our study, this issue is important also because medication therapy could have negative effects on health outcomes if not used appropriately. For example, studies have shown that heavy use of medications, particularly in the elderly who are most likely to have multiple chronic conditions, increases the risk of having adverse drug reactions and drug–drug interactions (Lorgunpai et al. 2014, Routledge et al. 2004, Sarkar et al. 2011, Steinman et al. 2006). Thus, policymakers must use care in crafting policy interventions so that they do not inadvertently cause harm.

In this chapter, we explore the complexity involved in measuring the effects of medication adherence on medical spending, taking into account the heterogeneity we observed in our previous analysis, even among individuals who appeared to have a similar level of adherence. We examine how changes in cohort definitions and model specifications affect estimated effects of medication adherence on medical spending. We focus on Medicare beneficiaries with CHF primarily because the effectiveness of the evidenced-based treatment for CHF in improving health outcomes for patients with CHF has been well established in randomized clinical trials (Hunt et al. 2005).

Our study findings highlight the difficulty of interpreting the estimates of the effects of medication adherence as measured by spending differentials between adherent and nonadherent individuals. The difficulty may be exacerbated by the more complex health profiles of the Medicare population compared with the general population often used in the studies of medication adherence.

Cohort selection

For this study, we relied on diagnoses in medical claims to identify beneficiaries with CHF. Because of the

progressive nature of the disease, we applied an algorithm to limit the cohort to those in the early stage of the disease (i.e., those with a relatively new diagnosis of CHF).

We did not require possession of study medications to be included in the study cohort. However, we restricted the study cohort to those who were likely candidates for receiving at least one of the CHF medications.² For example, we excluded beneficiaries in hospice at any time before the initial diagnosis or those who entered hospice shortly after the diagnosis. Additional exclusions applied in selecting the study cohort included:

- beneficiaries residing in long-term care institutions in the three-month period before their qualifying event;
- beneficiaries for whom Medicare entitlement was based on disability; and
- beneficiaries who died at discharge or during an inpatient stay, if their qualifying event was in an inpatient setting.

Finally, beneficiaries were required to be continuously enrolled in fee-for-service Medicare (Part A and Part B) during the three-year period before the qualifying CHF event (or one-year period if they were 66 years or 67 years of age at the time of the qualifying event) and the three-year period after the qualifying event or until death. Beneficiaries also had to be continuously enrolled in Medicare Part D in the one-year period before the qualifying CHF event and the three-year period after the qualifying event or until death.

We used Medicare claims data from January 1, 2005, through December 31, 2010, for services covered under Part A and Part B and claims data from July 1, 2007, through December 31, 2012, for services covered under Part D. Medicare claims were linked with the Medicare Enrollment Database to create a longitudinal file that included demographic and Medicare enrollment characteristics, medical diagnosis, prescription drug use, and medical service use such as procedures, physician visits, home health and skilled nursing facility (SNF) care, and durable medical equipment (DME).

Identifying a CHF event using medical claims

A qualifying CHF event was identified using claims in the inpatient, outpatient (including emergency and nonemergency claims), and other settings, such as physician offices. To be included in the study, we required that a beneficiary have at least one inpatient claim with a

**TABLE
7-1**

Demographic and health characteristics by CHF medication use before and after qualifying CHF event

Demographic and health characteristics	CHF medication use pattern*			
	None before/ None after	None before/ Drugs after	Drugs before/ None after	Drugs before/ Drugs after
Number of beneficiaries	54,607	79,189	10,334	253,952
Percent of beneficiaries	14%	20%	3%	64%
Percent with qualifying CHF event in:				
Inpatient setting	56%	64%	56%	58%
Outpatient or other setting	44	36	44	42
Mean age at qualifying CHF event	82.3	80.8	82.1	80.8
Mean number of illness categories	2.1	1.7	3.4	2.3
Mortality rate				
60 days after qualifying CHF event	18.8%	2.3%	39.0%	5.3%
180 days after qualifying CHF event	24.0	3.9	47.8	7.5
3 years after qualifying CHF event	53.1	28.5	74.2	31.2

Note: CHF (congestive heart failure). Totals may not sum to 100 percent due to rounding.

*Medication use patterns based on the use of CHF medications during the six months preceding the qualifying CHF event ("before") and up to three years following the qualifying CHF event ("after").

Source: Acumen LLC analysis of Medicare data for MedPAC.

CHF diagnosis between January 1, 2008, and December 31, 2009, or at least two claims with a CHF diagnosis in outpatient or other settings, and no CHF claims in any setting in the three years before, so that only beneficiaries with a relatively new diagnosis were included in the cohort.³ For beneficiaries who were 66 years or 67 years old at the time of the qualifying CHF event, we required that there be no CHF claims in any setting for one year before the qualifying CHF event or since their enrollment in Medicare. About 60 percent of the qualifying CHF events were diagnoses recorded on an inpatient claim, while the remaining approximately 40 percent were based on diagnoses recorded on claims for outpatient or other settings (Table 7-1).

Patterns of CHF medication use

We considered CHF medications with strong evidence of clinical effectiveness (see online Appendix 7-A, available at <http://www.medpac.gov>). The medications fell into three major groups:

- angiotensin-converting enzyme (ACE) inhibitors;
- angiotensin receptor blockers (ARBs); and

- cardioselective beta-blockers and alpha- and beta-blockers.

We selected these medications because a number of randomized controlled trials have shown that ACE inhibitors, ARBs, and beta-blockers are effective in improving health outcomes for patients with CHF (Hunt et al. 2005). Some studies have suggested that appropriate use of these medications could reduce the use of other medical services (Goldman et al. 2007, Sokol et al. 2005).

A comparison of medication use before and after the qualifying CHF event suggested that identification of the study cohort based on medical claims diagnoses may not be reliable in identifying beneficiaries who were likely candidates for starting on CHF medications. For example, about two-thirds of beneficiaries were using CHF medications before their qualifying events, possibly for other cardiovascular conditions. Consequently, only a small proportion of beneficiaries who experienced a qualifying CHF event had newly started on CHF medications within six months after the event.⁴

Table 7-1 shows the distribution of beneficiaries across four different patterns of medication use before and after

the qualifying CHF event. The majority (64 percent) of the beneficiaries in the CHF cohort was already on CHF medications during the six-month period preceding the qualifying event (“drugs before”) and continued to take at least one CHF medication during the three-year period after the event (“drugs after”). Twenty percent started on a CHF medication regimen after the qualifying event, while 3 percent discontinued CHF medications after the qualifying event. The remaining 14 percent did not take any CHF medications either before or after the qualifying event (“none before/none after”).

Beneficiaries who were on CHF medications before the qualifying event (“drugs before” categories) had a greater number of illnesses, on average, compared with those who were not on CHF medications (“none before” categories). Most notably, we found higher incidences of hypertension among beneficiaries in “drugs before” categories (over 70 percent) compared with beneficiaries in “none before” categories (about 50 percent) (data not shown). We also observed much higher mortality rates among beneficiaries who did not start on CHF medications after the qualifying event. Beneficiaries who discontinued CHF medications after the qualifying event had the highest mortality, with nearly 40 percent dying within the first 60 days of the qualifying event. Nearly three-quarters died within three years of the qualifying event (Table 7-1, p. 129). Beneficiaries in the “none before/none after” category had the second highest mortality rate, with nearly 20 percent dying within the first 60 days and less than half surviving for more than three years after the qualifying event. Mortality rates were similar between beneficiaries who started on CHF medications after the event (“none before/drugs after”) and beneficiaries who continued on CHF medications after the event (“drugs before/drugs after”) by the end of the three-year period after the qualifying event.

The higher incidence of other medical conditions (mean number of illness categories), including hypertension in beneficiaries with prior CHF drug use (“drugs before”), compared with the rest of the cohort may complicate our measurements of the effects of CHF medication use on medical spending. Beneficiaries with more complex health profiles were likely to have higher medical spending that was unrelated to their CHF diagnosis. The higher mortality rates observed among the “none after” categories suggest that a larger share of beneficiaries in these categories were likely sicker than other beneficiaries in the CHF cohort, and many were already near the end of life at the time of the qualifying CHF event. Although it is possible that not adhering to the CHF medication regimen caused worse

health outcomes, the causality could also go the other way. That is, the poorer health status may account for the observed low adherence to CHF medications (“none after”) and higher medical spending before the CHF event (data not shown).

Because medications used to treat CHF are often used to treat other conditions—such as hypertension or other precursory risk factors—we began our analysis with a restricted cohort intended to limit the confounding effects of those preexisting health conditions. Thus, the first restriction we applied was to require that beneficiaries not be on CHF medications before the qualifying event (“none before”). We later examined the effects of excluding beneficiaries in the “none before/none after” category, the group with the second highest mortality rate, from the analysis.

Finally, it is possible that a CHF diagnosis on claims reflects screening and other diagnostic events rather than an actual diagnosis that warrants an initiation of a medication therapy, which may explain why some beneficiaries did not initiate medication therapy following a qualifying event. Such claims may be more likely in outpatient settings. In fact, we found that the proportion of beneficiaries newly starting on CHF medications after the qualifying event was somewhat higher among those beneficiaries whose identification was based on inpatient claims (21 percent) compared with those whose identification was based on claims from outpatient settings (about 18 percent). Thus, to be conservative, in our initial analysis, we further restricted the study cohort to beneficiaries who received their initial CHF diagnosis in an inpatient setting (second restriction).

Our initial study cohort consisted of 80,719 beneficiaries. These beneficiaries were in one of the two “none before” categories and received their initial CHF diagnosis in an inpatient setting (56 percent of the “none before/none after” category and 64 percent of the “none before/drugs after” category). Later, we relaxed these restrictions and reported the results of the analyses based on three variations of the study cohort.

Assignment of adherence levels

We examined the medication use patterns in the initial (restricted) study cohort (80,719 beneficiaries)—i.e., beneficiaries with qualifying CHF events in the inpatient

setting with no CHF drug use in the six months before the qualifying event. We defined *adherence* as possessing any of the study medications based on Part D prescription drug event data and determined whether a beneficiary was classified as adherent or not adherent on a monthly basis.⁵ This definition allowed beneficiaries to be treated as adherent when their medication(s) were changed to another CHF medication (or medications) for clinical reasons.

We assigned the study cohort to one of three groups based on the level of adherence. Beneficiaries starting on any of the CHF medications within three months of the qualifying event and continuing on any of the CHF medications for at least six months were assigned to the high-adherence group. Those who started on CHF medications within three months of the qualifying event but discontinued using CHF medications within six months of the initiation of the therapy were assigned to the low-adherence group. Finally, those who either did not start on CHF medications after a qualifying event or started on CHF medication(s) more than three months after the qualifying event were classified in the nonadherent group.

Less than half (45 percent) of the beneficiaries (high- and low-adherence groups combined) in this restricted cohort started on at least one of the CHF study medications within three months of the qualifying event (Table 7-2, p. 132). About 70 percent of those (32 percent of the study cohort) continued to take the CHF medications for at least six months (high-adherence group). The other 30 percent (13 percent of the study cohort) discontinued within six months of the initiation of the medication therapy (low-adherence group). The remaining 55 percent did not start on CHF medications after a qualifying event, or they started on CHF medication(s) more than three months after the qualifying event (nonadherent group).

Most studies of medication adherence use the proportion of days covered (PDC) metric as a proxy for medication adherence. We measured the PDC in our study cohort during the six months after the qualifying CHF event. The PDC averaged about 83 percent among beneficiaries in the high-adherence group, about 38 percent among beneficiaries in the low-adherence group, and about 4 percent among beneficiaries in the nonadherent group. The majority (89 percent) of beneficiaries in the nonadherent group did not start on CHF medications within six months of the qualifying event. Among the 11 percent who did start on CHF medications, the PDC averaged about 30 percent. A PDC at or above 80 percent is typically considered adherent to a given drug therapy.⁶

Characteristics of beneficiaries by adherence levels

We found that beneficiaries with different adherence levels also differed in ways that may have affected their ability to adhere to a medication therapy. Table 7-2 (p. 132) presents demographic and health characteristics of the CHF study cohort at baseline (i.e., during the six-month period before the qualifying CHF event) by the level of adherence to study medications. Beneficiaries in the nonadherent group tended to be older and have higher incidence of illnesses, such as chronic obstructive pulmonary disease, specified heart arrhythmias, cancer, and renal failure, compared with beneficiaries in the other two groups (high- and low-adherence groups).

Average monthly medical spending and use per person during the six-month period before the qualifying event also suggests beneficiaries in the nonadherent group had poorer health status, on average, compared with those in the high- and low-adherence groups before the qualifying event. Medicare spending per month averaged over \$1,500 among beneficiaries in the nonadherent group, compared with \$1,144 among those in the low-adherence group and less than \$1,000 among those in the high-adherence group. The difference in average Medicare costs was driven primarily by the higher rates of inpatient admissions among beneficiaries in the nonadherent group compared with the other two groups. Beneficiaries in the nonadherent group also had more physician office visits compared with the other groups (4.7 visits per beneficiary compared with 3.9 and 4.4 visits per beneficiaries for high- and low-adherence groups, respectively).

Finally, the higher short-term (180 days after the qualifying CHF event) and long-term (1 year and 3 years after the qualifying CHF event) mortality rates among beneficiaries in the nonadherent group compared with those in high- and low-adherence groups also suggests poorer health status among beneficiaries in the nonadherent group compared with beneficiaries in the other groups. Notably, the short-term mortality rate among beneficiaries in the low-adherence group (3.2 percent) was lower compared with that observed among beneficiaries in the high-adherence group (7.2 percent). However, that relationship was reversed at the one-year mark after the qualifying event. It is not clear whether this change reflects effects of better adherence to medication therapy or differences in prior health status (Table 7-2, p. 132).

**TABLE
7-2**

Demographic and health characteristics of beneficiaries in the CHF study cohort by adherence group

Beneficiaries in CHF study cohort by level of adherence

Demographic and health characteristics	Adherent		
	High adherence	Low adherence	Nonadherent
Number of beneficiaries	25,921	10,212	44,586
Percent of beneficiaries	32%	13%	55%
Proportion of days covered	83%	38%	4%
Age at qualifying CHF event date			
Mean	81	81	82
By age category (in percent)			
70 or younger	11%	10%	8%
71–80	34	33	30
81–85	22	23	22
86 or older	33	34	40
Percent:			
Female	64%	61%	65%
White	88	83	87
Receiving the low-income subsidy	65	61	62
Residing in urban areas	33	31	33
Mean number of illness categories	1.5	1.7	2.0
Percent with selected illnesses			
Diabetes	19%	21%	21%
Chronic obstructive pulmonary disease	16	19	25
Specified heart arrhythmias	15	16	19
Cancer	11	12	14
Renal failure	8	11	12
Stroke	4	4	6
Baseline average health care use			
Medicare costs per month	\$978	\$1,144	\$1,528
Number of inpatient admissions per 1,000	213	261	366
Inpatient days per admission	5.2	5.3	5.7
Number of physician office visits per beneficiary	3.9	4.4	4.7
Mortality rate			
180 days after qualifying CHF event	7.2%	3.2%	17.8%
1 year after qualifying CHF event	19.3	23.7	34.0
3 years after qualifying CHF event	40.7	48.2	56.1

Note: CHF (congestive heart failure). Totals may not sum to 100 percent due to rounding.

Source: Acumen LLC analysis of Medicare data for MedPAC.

Analytical approach

We began our analysis using the restricted cohort of beneficiaries identified as having had a CHF event in

the inpatient setting, with no prior CHF medication use (the initial cohort of 80,719 beneficiaries). Even within this restricted cohort, the demographic and health characteristics of beneficiaries differed across the beneficiaries with different levels of adherence to

medication use. Our analyses explored how different model specifications, selected beneficiary characteristics such as age and low-income subsidy (LIS) status, and criteria used to select the study cohort affected the estimated effects of better adherence.

We used a multivariate regression model to estimate medical spending over two outcome periods, the first six months (months 1 through 6) and the following six months (months 7 through 12) after the qualifying CHF event. We fitted the following ordinary least squares regression model to compare medical spending across the three adherence groups:

$$Y_i = \alpha + Y_1 \text{High Adherence}_i + Y_2 \text{Low Adherence}_i + \beta_1 X_i + \varepsilon_i$$

where Y_i is the average medical spending per month for beneficiary i , adjusted for the number of days alive. “High Adherence” and “Low Adherence” are dummy variables corresponding to our high- and low-adherence groups, respectively. The nonadherent group serves as the reference group. Estimates Y_1 and Y_2 indicate spending differentials for the two adherence groups relative to the nonadherent group. Depending on the model, X includes sociodemographic characteristics, comorbid conditions, medical spending, and drug use patterns before the qualifying event, and indicators for survival status at 6 months and 12 months after the CHF event. A complete list of covariates is provided in the appendix (see online Appendix 7-B, available at <http://www.medpac.gov>).

Estimated effects of medication adherence

The effects of medication adherence are typically measured by comparing the medical spending of the adherent population to the nonadherent population and attributing the difference in the spending levels to health outcomes resulting from adhering to medication therapies (Cole et al. 2006, Lynch et al. 2009, Roebuck et al. 2011, Sokol et al. 2005). The results reported are effects on Medicare Part A and Part B spending and do not net out the costs of medications to Part D. Because CHF medications included in this study are in classes with many generic substitutes, the cost of adhering to medications was relatively low, ranging from a few dollars to slightly over \$20 per month, on average, depending on

the level of adherence. Netting out the Part D costs does not materially change our findings.

Comparison across different model specifications

We estimated the effects of better medication adherence on medical spending for the initial study cohort using the following six model specifications:

1. adherence-group indicators;
2. adherence-group indicators and sociodemographic characteristics (excluding race);
3. adherence-group indicators and sociodemographic characteristics (including race);
4. adherence-group indicators, sociodemographic characteristics (excluding race), comorbidities, and drug use patterns at baseline;
5. adherence-group indicators, sociodemographic characteristics (excluding race), comorbidities, drug use patterns at baseline, and medical spending at baseline; and
6. adherence-group indicators, sociodemographic characteristics (excluding race), comorbidities, drug use patterns at baseline, medical spending at baseline, and survival status indicators.

Table 7-3 (p. 134) shows the difference in average monthly medical spending between the adherent groups (high- and low-adherence groups) and the nonadherent group for the six model specifications described above. The estimated medical spending effects during the first six months after the qualifying CHF event (outcome period 1) were lower among the adherent beneficiaries compared with those of nonadherent beneficiaries for all six model specifications. The estimated effects generally declined as more variables were added to control for differences in beneficiary characteristics and health status, as measured by baseline health care use, across the three groups. For example, among beneficiaries with high adherence, the estimated effects went down from \$5,142 for the specification with no adjustment for beneficiary characteristics or health status (specification 1) to \$4,869 when the model controlled for sociodemographic characteristics, comorbidities, and patterns of medication use (specification 4). However, we found that adding sociodemographic characteristics (with or without race) had very little effect on the estimated spending differentials (specification 2 and specification 3).

**TABLE
7-3**

Estimated average monthly medical spending differentials between beneficiaries in adherent groups and nonadherent group, by outcome period

Model specification	Difference between nonadherent group and:			
	High-adherence group		Low-adherence group	
	Months 1-6	Months 7-12	Months 1-6	Months 7-12
1: Adherence indicator	-\$5,142*	-\$839*	-\$4,178*	\$326*
2: Model 1 + sociodemographic characteristics (excluding race)	-5,058*	-804*	-4,313*	244
3: Model 1 + sociodemographic characteristics (including race)	-5,062*	-803*	-4,337*	219
4: Model 2 + comorbidities + drug use pattern at baseline	-4,869*	-485*	-4,185*	459*
5: Model 4 + medical spending at baseline	-4,783*	-387*	-4,128*	500*
6: Model 5 + survival status indicators	-2,620*	-124	-2,270*	391*

Note: "Months 1-6" refers to the first six months after the qualifying congestive heart failure (CHF) event (outcome period 1), and "months 7-12" refers to the second six months after the qualifying CHF event (outcome period 2).
*Denotes statistical significance at the 5 percent level.

Source: Acumen LLC analysis of Medicare data for MedPAC.

We found that adding survival status indicators had the largest effect, reducing the estimated effects by nearly half (to \$2,620) (specification 6). Similar patterns were observed for beneficiaries with low adherence, though the estimated effects were somewhat smaller for all model specifications compared with those observed for the high-adherence group.

For the second six months after the qualifying event (outcome period 2), the estimated spending differentials were much smaller for the high-adherence group compared with those observed during outcome period 1. The spending effect was no longer statistically significant once the survival status indicator was added (specification 6). For beneficiaries in the low-adherence group, we found that estimated spending was consistently higher (though not always statistically significant) compared with the spending levels observed among beneficiaries in the nonadherent group.

Comparison between subgroups

We conducted two subgroup analyses using specification 6 that included the full set of covariates. In the first subgroup analysis, we stratified the beneficiaries into those who were 80 years of age or younger and those who were over 80 years of age to assess the estimated effects of medication use by age. In the second subgroup analysis, we stratified the beneficiaries by their LIS status to assess

whether the estimated effects of medication use differed between LIS and non-LIS beneficiaries.

The magnitude of the spending differentials between adherent (high- and low-adherence groups) and nonadherent beneficiaries during outcome period 1 was larger for individuals over 80 years of age compared with those who were 80 years of age or younger (Table 7-4). The spending differentials were not statistically significant for outcome period 2, with the exception of older beneficiaries (over 80 years of age) with low adherence, where medical spending, on average, exceeded that of the nonadherent beneficiaries by \$644 per month.

The spending differentials between adherent and nonadherent beneficiaries were larger among individuals receiving the LIS compared with those who did not receive the LIS during outcome period 1 (Table 7-4). But those spending differentials did not persist beyond the first six months, with the exception of LIS beneficiaries with relatively low adherence. Their medical spending exceeded that of the nonadherent beneficiaries receiving the LIS by \$710 per month, on average.

Comparison across different cohort selection criteria

We examined whether the definitions used to identify the study cohort affected the estimated spending effects of medication adherence. For this analysis, we used three variations on the definition of the study cohort and

**TABLE
7-4**

Estimated average medical spending differentials among subgroups of beneficiaries in adherent groups and nonadherent group, by outcome period

Subgroups	Difference between nonadherent group and:			
	High-adherence group		Low-adherence group	
	Months 1-6	Months 7-12	Months 1-6	Months 7-12
All beneficiaries	-\$2,620*	-\$124	-\$2,270*	\$391*
By age				
≤ 80 years of age	-2,108*	-283	-1,992*	62
> 80 years of age	-2,927*	43	-2,444*	644*
By LIS status				
LIS	-3,060*	-163	-2,648*	710*
Non-LIS	-2,366*	-116	-2,061*	198

Note: LIS (low-income subsidy). "Months 1-6" refers to the first six months after the qualifying congestive heart failure (CHF) event (outcome period 1), and "months 7-12" refers to the second six months after the qualifying CHF event (outcome period 2).

*Denotes statistical significance at the 5 percent level.

Source: Acumen LLC analysis of Medicare data for MedPAC.

compared the results for model specification 6 (see online Appendix 7-C, available at <http://www.medpac.gov>).

The first variation excluded from the nonadherent group those individuals who did not start on CHF medications within six months of the qualifying CHF event. This variation was equivalent to defining the study cohort based on possession of study medication(s) during a specified time period. We found spending differentials were larger for both the high- and low-adherence groups when we excluded individuals with no CHF medication use (see online Appendix 7-C, available at <http://www.medpac.gov>). This finding is somewhat puzzling and may require further investigation. If the measured effects truly reflect the effects of taking CHF medications, this finding would imply that—at least for those in the nonadherent group—health outcomes were worse for those who started on CHF medications compared with those who did not. One possible explanation is that many individuals who started on CHF medication(s) experienced adverse drug reactions from one or more medications, which would explain the greater use of health care services as well as low adherence. The second variation expanded the study cohort to include beneficiaries who were on CHF medications before the qualifying event ("drugs before/ drugs after" and "drugs before/none after" categories),

and the third variation included individuals for whom the qualifying CHF events were in a noninpatient setting (such as a hospital outpatient department or a physician's office). The results show that estimated effects are sensitive to the criteria used to select the study population (see online Appendix 7-C).

Discussion

In this study, we examined whether and how the relationship between medication adherence and medical spending varied by the model specification we chose, how we defined the adherent population versus nonadherent population, and the criteria we used to select the study cohort. One goal was to understand the complexity involved in defining the study cohort. Our other goal was to measure how sensitive the estimated effects of medication adherence on medical spending were to the definition used to select the study cohort and the model specification used for the analysis. We chose CHF because the effectiveness of the evidence-based CHF treatment in improving health outcomes has been well established in randomized clinical trials, and thus, Medicare beneficiaries with CHF would be expected to benefit the

most from improved medication adherence by preventing complications that result in inpatient admissions, thereby reducing overall medical costs (Goldman et al. 2007, Hunt et al. 2005, Roebuck et al. 2011, Sokol et al. 2005).

Our primary finding is that better adherence to an evidence-based CHF medication regimen is associated with lower medical spending among Medicare beneficiaries with CHF. A comparison of unadjusted Medicare spending across the adherence groups suggests that the spending effects are driven primarily by fewer inpatient admissions and skilled nursing facility days among the beneficiaries in the adherent groups compared with the nonadherent group during the first six months after the CHF event. A closer examination of the medical service use during the outcome period may provide insight into the relationship between the baseline health status, medication-taking behavior, and the medical service use after the CHF event.

Although we find an association between medication adherence and lower medical spending, the estimated effects on medical spending were sensitive to the methodology used to measure the effects, and those effects diminish over time. For example, including an indicator for survival status reduced the estimated effects by nearly half. We also find that using different criteria to select the study cohort results in different estimates of the spending effects. Further, our subgroup analyses suggest that estimated spending effects vary by age and LIS status, and likely by other individual characteristics, such as institutionalized status.

The likely existence of selection bias among adherent and nonadherent beneficiaries not observable in administrative data makes it difficult to interpret the results. A comparison across beneficiaries with different levels of adherence suggests that beneficiaries who were following the guideline CHF medication regimen tended to be healthier than nonadherent beneficiaries, with fewer medical conditions and lower medical spending in the period preceding a CHF event and lower mortality rates after the CHF event. Thus, our estimated effects could reflect the benefit of adhering to the recommended medication therapy, or it may reflect, for example, physicians' decisions about the appropriate treatment given the health status of their patients. Patients themselves could also differentially self-select whether to follow the recommended medication regimen, which may be correlated with behaviors or attitudes that affect their

health and influence medical spending independent of their medication-taking behavior.

Despite an attempt to adjust our estimates for the possibility of this selection bias, our findings suggest that controlling for observed differences in beneficiary characteristics may not be sufficient to fully account for the effects of selection bias. For instance, we initially applied restrictive criteria—intended to select only individuals who were candidates for starting on a guideline CHF medication treatment—for inclusion in the study cohort. However, even with this restricted cohort, we find that our estimate of the effects of medication adherence on medical spending is sensitive to model specifications, particularly when we add variables that measure differences in health status, such as comorbidities, prior medical spending, and drug use patterns. Sociodemographic characteristics, on the other hand, had very little influence on estimated spending effects.

Adding information on mortality to our fully specified model—which already included sociodemographic factors, comorbidities, and prior medical spending and patterns of drug use—had the greatest effect. Estimates based on model specifications that did not include short-term mortality (survival status within six months of the CHF event) suggested that medical spending for adherent beneficiaries was lower than that of nonadherent beneficiaries by \$4,000 to \$5,000 per month, on average. Including the survival indicator reduced that estimated “saving” by nearly half.

This finding highlights the difficulty involved in adjusting for health and other differences between adherent and nonadherent individuals using factors that can be observed (i.e., in administrative data). While the average medical spending per month is adjusted for the number of days alive, high spending near the end of life likely contributed to the larger spending effects in models that do not include survival status indicators. It is possible that the higher mortality rate observed among individuals in the nonadherent group is the result of not taking CHF medications. That is, the inclusion of the survival status is causing an endogeneity problem that may require the use of other econometric techniques such as instrumental variables. It is also possible that mortality, particularly in the short term, is capturing some of the differences in health status that were not captured by other health status variables in the model. Although determining the extent to which health status variables, such as survival status, are correlated with medication adherence is beyond the scope

of this study, we note that this issue may be exacerbated by the more complex health profiles of the Medicare population compared with the general population often used in the studies of medication adherence.

Finally, the results consistently show that effects of medication adherence diminish over time. We found striking differences in the estimated spending effects during the first six months after the qualifying CHF event (outcome period 1) compared with the second six months after the event (outcome period 2). For example, the estimated spending differential for beneficiaries with a relatively high adherence suggests that adhering to the CHF medication regimen lowers medical spending by nearly \$5,000 per month on average during outcome period 1, compared with about \$400 to \$800 during outcome period 2. Accounting for the difference in the mortality rates reduced the outcome period 1 estimate to about \$2,600, which is still much larger than the corresponding estimate for outcome period 2 (\$124). In the case of beneficiaries with relatively low adherence, the estimated spending effects were positive, indicating higher medical spending relative to those who were nonadherent. This pattern was consistent across all model specifications and cohort definitions.

These findings further complicate the interpretation of spending differentials between adherent and nonadherent individuals. Does lower spending during outcome period 1 represent lower medical spending resulting from better

adherence to CHF medication regimen? If so, why does most of that effect disappear in outcome period 2? Alternatively, does it reflect differences in health status that existed before the CHF event? If so, what explains the reversal in the effects for some cohorts in outcome period 2?

Although our analysis examined only one condition (CHF) and is therefore not generalizable to other conditions or populations, this study underscores the complexity involved in estimating the effects of medication adherence. Our findings suggest that one must use caution when using administrative data to estimate the effects of medication adherence. This study also highlights many gaps in our understanding of how medication adherence affects health care spending and use. For example, we need a better understanding of why adherence decays within a relatively short period of time and how that may affect the short-term and long-term effects of adhering to medication therapies.

As policymakers consider interventions to increase adherence to medication therapies, we need a better understanding of how the effects of medication adherence vary by condition and by population subset, particularly if the population includes vulnerable individuals with multiple chronic conditions. More research is needed to determine clinical conditions for which medication adherence improves health outcomes so that efforts to improve adherence can be focused on those conditions. ■

Endnotes

- 1 These findings are for beneficiaries with a diagnosis of CHF based on CMS's prescription drug hierarchical condition category, used to assign risk scores to each Part D enrollee. To avoid including beneficiaries at a very advanced stage of CHF, we limited the study cohort to those with no claims for implantable cardioverter-defibrillators or biventricular pacemakers.
- 2 The new cohort selection criteria differed from the one used for our previous analysis. First, we no longer required that a beneficiary fill the study medication(s) during the observation period. Instead, the new criteria were designed to select those who were likely to have been prescribed one of the CHF medications. Second, instead of relying on claims for implantable cardioverter-defibrillators or biventricular pacemakers to determine the severity of the disease (because CHF is a progressive disease), we selected only those who were newly diagnosed with CHF so that individuals included in the study cohort were likely to be at an early stage of CHF.
- 3 The International Classification of Diseases, Ninth Revision, Clinical Modification codes used to identify CHF diagnosis were 428, 4280–4282, 42820–42823, 4283, 42830–42833, 4284, 42840–42843, 4289, 40211, 40291, 40411, and 40491.
- 4 We considered beneficiaries to have newly started on CHF medications if they did not have any CHF medication use during the six-month period preceding the qualifying CHF event and started on at least one CHF medication within six months after the qualifying event.
- 5 Because we are using administrative data to measure medication adherence, we relied on a possession of study medication(s) to measure adherence, which is an imperfect measure since people may not take all the medications they obtain.
- 6 A PDC threshold of 0.8 (80 percent) is endorsed by the Pharmacy Quality Alliance and is commonly used by health services researchers.

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A P P E N D I X

A

**Commissioners' voting
on recommendations**



Commissioners' voting on recommendations

In the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000, the Congress required MedPAC to call for individual Commissioner votes on each recommendation and to document the voting record in its report. The information below satisfies that mandate.

Chapter 1: Synchronizing Medicare policy across payment models

No recommendations

Chapter 2: Improving risk adjustment in the Medicare program

No recommendations

Chapter 3: Measuring quality of care in Medicare

No recommendations

Chapter 4: Financial assistance for low-income Medicare beneficiaries

No recommendations

Chapter 5: Per beneficiary payment for primary care

No recommendations

Chapter 6: Site-neutral payments for select conditions treated in inpatient rehabilitation facilities and skilled nursing facilities

No recommendations

Chapter 7: Measuring the effects of medication adherence for the Medicare population

No recommendations

Acronyms

Acronyms

A/B	Part A and Part B	FY	fiscal year
ABIM	American Board of Internal Medicine	GAO	Government Accountability Office
ACC	American College of Cardiology	H-CAHPS®	Hospital–Consumer Assessment of Healthcare Providers and Systems®
ACCF	American College of Cardiology Foundation	HCC	hierarchical condition category
ACE	angiotensin-converting enzyme	HEDIS®	Healthcare Effectiveness Data and Information Set®
ACO	accountable care organization	HHA	home health agency
ADL	activity of daily living	HIV	human immunodeficiency virus
AHRQ	Agency for Healthcare Research and Quality	HMO	health maintenance organization
AMA	American Medical Association	HRR	hospital referral region
AMI	acute myocardial infarction	HSA	hospital service area
ARB	angiotensin receptor blocker	IDTF	independent diagnostic testing facility
ASC	ambulatory surgical center	IPPS	inpatient prospective payment system
ASNC	American Society of Nuclear Cardiology	IQR	Inpatient Quality Reporting [program]
CAHPS®	Consumer Assessment of Healthcare Providers and Systems®	IRF	inpatient rehabilitation facility
CARE	Continuity Assessment Record and Evaluation [tool]	LIS	low-income [drug] subsidy
CBO	Congressional Budget Office	LTCH	long-term care hospital
CC	complication or comorbidity	MA	Medicare Advantage
CCNC	Community Care of North Carolina	MACPAC	Medicaid and CHIP Payment and Access Commission
CHF	congestive heart failure	MAPCP	Multi-Payer Advanced Primary Care Practice
CHIP	Children’s Health Insurance Program	MCC	major complication or comorbidity
CMG	case-mix group	MedPAC	Medicare Payment Advisory Commission
CMI	case-mix index	MGMA	Medical Group Management Association
CMMI	Center for Medicare and Medicaid Innovation	MIPPA	Medicare Improvements for Patients and Providers Act of 2008
CMS	Centers for Medicare & Medicaid Services	MMA	Medicare Prescription Drug, Improvement, and Modernization Act of 2003
CMS–HCC	CMS–hierarchical condition category	MRI	magnetic resonance imaging
COPD	chronic obstructive pulmonary disease	MSA	metropolitan statistical area
CPCI	Comprehensive Primary Care Initiative	MSA	medical savings account
CPS	Current Population Survey [of the Census Bureau]	MS–DRG	Medicare severity–diagnosis related group
CT	computed tomography	MSP	Medicare Savings Program
CY	calendar year	MSSP	Medicare Shared Savings Program
DME	durable medical equipment	NCQA	National Committee for Quality Assurance
DRG	diagnosis related group	NTA	nontherapy ancillary
E&M	evaluation and management	OOP	out-of-pocket
ED	emergency department	OPD	outpatient department
EHR	electronic health record	OPPS	outpatient prospective payment system
ESRD	end-stage renal disease	OQR	Outpatient Quality Reporting [program]
FFS	fee-for-service	PAC	post-acute care
FMAP	federal medical assistance percentage	PACE	Program for All-Inclusive Care for the Elderly
FPL	federal poverty level		
FQHC	Federally Qualified Health Center		

PAC-PRD	Post-Acute Care Payment Reform Demonstration	QDWI	qualified disabled working individual
PAPCP	Multi-Payer Advanced Primary Care Practice	QI	qualifying individual
PCIP	Primary Care Incentive Payment program	QMB	qualified Medicare beneficiary
PCMH	primary care medical home	RUC	Relative Value Scale Update Committee
PCP	primary care physician	RVS	relative value scale
PCP	primary care practitioner	RVU	relative value unit
PDC	proportion of days covered	RxHCC	prescription drug hierarchical condition category
PMPM	per member per month	SCHIP	State Children's Health Insurance Program
PPA	potentially preventable admission	SGR	sustainable growth rate
PPACA	Patient Protection and Affordable Care Act of 2010	SLMB	specified low-income Medicare beneficiary
PPO	preferred provider organization	SNF	skilled nursing facility
PPS	prospective payment system	SNP	special needs plan
PPV	potentially preventable visit [to the ED]	SSI	Supplemental Security Income
		VBP	value-based purchasing [program]

More about MedPAC

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Michael Chernew, Ph.D., vice chairman

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Boston, MA

Term expires April 2014

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Michael Chernew, Ph.D.

Bill Gradison Jr., M.B.A.

McLean, VA

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David Nerenz, Ph.D.

Henry Ford Health System

Detroit, MI

Rita Redberg, M.D.

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F.A.C.H.E.**

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Herb B. Kuhn

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**Cori Uccello, F.S.A., M.A.A.A.,
M.P.P.**

American Academy of Actuaries

Washington, DC

Commissioners' biographies

Scott Armstrong, M.B.A., F.A.C.H.E., is president and chief executive officer (CEO) of Group Health Cooperative, a consumer-governed health system serving 650,000 enrollees through coordinated care plans for groups and individuals and for Medicare, Medicaid, and State Children's Health Insurance Program beneficiaries. He has worked at Group Health since 1986, serving in positions ranging from assistant hospital administrator to chief operating officer; he became president and CEO in 2005. Before joining Group Health, Mr. Armstrong was assistant vice president for hospital operations at Miami Valley Hospital in Dayton, OH. Mr. Armstrong is a member of the board of the Alliance of Community Health Plans and board member of America's Health Insurance Plans and the Seattle Chamber of Commerce. He is also immediate past chair of the Board of the Pacific Science Center and a fellow of the American College of Healthcare Executives. He received his bachelor's degree from Hamilton College in New York and a master's degree in business with a concentration in hospital administration from the University of Wisconsin–Madison.

Katherine Baicker, Ph.D., is professor of health economics in the Department of Health Policy and Management at the Harvard School of Public Health, where her research focuses on health insurance finance and the effect of reforms on the distribution and quality of care. Dr. Baicker has served on the faculty of the Department of Public Policy in the School of Public Affairs at the University of California, Los Angeles; the Economics Department at Dartmouth College; and the Center for the Evaluative Clinical Sciences and the Department of Community and Family Medicine at Dartmouth Medical School. From 2005 to 2007, Professor Baicker served as a Senate-confirmed member of the President's Council of Economic Advisers. She is a research associate at the National Bureau of Economic Research, is on the Congressional Budget Office's Panel of Health Advisers, and is an elected member of the Institute of Medicine. She also served as a commissioner of the Robert Wood Johnson Foundation's Commission to Build a Healthier America and was a member of the Institute of Medicine's Committee on Health Insurance Status and Its Consequences. She received her B.A. in economics from Yale University and her Ph.D. in economics from Harvard University.

Peter W. Butler, M.H.S.A., is a nationally recognized health care executive with more than 30 years of experience in academic medical centers and health care systems. In addition to being president and chief operating officer of Rush University Medical Center in Chicago, IL, Mr. Butler is an associate professor and chairman of the Department of Health Systems Management at Rush University. Before joining Rush, he served as president and chief executive officer at the Methodist Hospital System in Houston and senior vice president and chief administrative officer at the Henry Ford Health System in Detroit. He has chaired the board of University HealthSystem Consortium, the board of the National Center for Healthcare, and the American Hospital Association section for Health Care Systems. He has also served on the boards of the Health Research and Educational Trust as well as the Texas and Michigan hospital associations.

Michael Chernew, Ph.D., is the Leonard D. Schaeffer Professor of Health Care Policy in the Department of Health Care Policy at Harvard Medical School. Dr. Chernew's research activities focus on several areas, most notably the causes and consequences of growth in health care expenditures, geographic variation in medical spending and use, and value-based insurance design. He is a member of the Congressional Budget Office's Panel of Health Advisers and Commonwealth Foundation's Commission on a High Performance Health System. In 2000, 2004, and 2011, he served on technical advisory panels for the Centers for Medicare & Medicaid Services that reviewed the assumptions used by the Medicare actuaries to assess the financial status of the Medicare trust funds. Dr. Chernew is a faculty research fellow of the National Bureau of Economic Research. He coedits the *American Journal of Managed Care* and is a senior associate editor of *Health Services Research*. In 2010, Dr. Chernew was elected to the Institute of Medicine (IOM) of the National Academy of Sciences and served on the IOM Committee on Determination of Essential Health Benefits. Dr. Chernew earned his undergraduate degree from the University of Pennsylvania and a doctorate in economics from Stanford University.

Jon B. Christianson, Ph.D., is the James A. Hamilton Chair in Health Policy and Management in the Division of Health Policy and Management at the School of Public

Health at the University of Minnesota. His research has addressed the areas of health finance, payment structures, rural health care, managed care payment, and the quality and design of care systems. Dr. Christianson serves on the Institute of Medicine's Board on Health Care Services and on the editorial board of the *American Journal of Managed Care*. He recently served on the Institute of Medicine's Committee on Geographic Adjustment Factors in Medicare Payment and has chaired AcademyHealth's annual research meeting. Dr. Christianson received his Ph.D. in economics from the University of Wisconsin.

Alice Coombs, M.D., is a critical care specialist and an anesthesiologist at Milton Hospital and South Shore Hospital in Weymouth, MA. She is board certified in internal medicine, anesthesiology, and critical care medicine. Dr. Coombs is past president of the Massachusetts Medical Society (MMS) and a member of MMS's Committee on Ethnic Diversity. She chaired the Committee on Workforce Diversity that is part of the American Medical Association's (AMA's) Commission to Eliminate Health Care Disparities and is on the Governing Council for the AMA Minority Affairs Consortium and the AMA Initiative to Transform Medical Education. She helped to establish the New England Medical Association, a state society of the National Medical Association that represents minority physicians and health professionals. Dr. Coombs has served as a member and vice chair of the Massachusetts Board of Registration in Medicine Patient Care Assessment Committee. In addition, she was a member of the Massachusetts Special Commission on the Health Care Payment System.

Bill Gradison Jr., M.B.A., D.C.S., was a scholar in residence in the Health Sector Management Program at Duke's Fuqua School of Business. He was a member of the U.S. Congress (1975–1993) where he served on the House Budget Committee and the Health Subcommittee of the Committee on Ways and Means. Mr. Gradison was a founding board member of the Public Company Accounting Oversight Board and was vice chairman of the U.S. Bipartisan Commission on Comprehensive Health Care ("Pepper Commission"). Prior positions also include assistant to the Secretary of Health, Education, and Welfare; president of the Health Insurance Association of America; and vice chair of the Commonwealth Fund Task Force on Academic Health Centers. Mr. Gradison received his B.A. from Yale University and an M.B.A. and doctorate from Harvard Business School.

Glenn M. Hackbarth, J.D., M.A., chairman of the Commission, lives in Bend, OR. He was chief executive officer and one of the founders of Harvard Vanguard Medical Associates, a multispecialty group practice in Boston that serves as a major teaching affiliate of Harvard Medical School. Mr. Hackbarth previously served as senior vice president of Harvard Community Health Plan and president of its Health Centers Division, as well as Washington counsel of Intermountain Health Care. He has held various positions at the U.S. Department of Health and Human Services, including deputy administrator of the Health Care Financing Administration (now known as CMS). He is also immediate past chairman of the board of the Foundation of the American Board of Internal Medicine. Mr. Hackbarth received his B.A. from Pennsylvania State University and his J.D. and M.A. from Duke University.

William J. Hall, M.D., M.A.C.P., is a geriatrician and professor of medicine at the University of Rochester School of Medicine, where he directs the Highland Hospital Center for Healthy Aging. He previously served as a member of the board of directors of AARP. His career has focused on systems of health care for older adults. He was instrumental in establishing the Program of All-Inclusive Care for the Elderly and developing many prevention and wellness programs for seniors. Dr. Hall's prior service and positions include president of the American College of Physicians and leadership positions in the American Geriatrics Society. He received his bachelor's degree from the College of the Holy Cross and his medical degree from the University of Michigan Medical School and pursued postdoctoral training at Yale University School of Medicine.

Jack Hoadley, Ph.D., is research professor at the Health Policy Institute of Georgetown University in Washington, DC. Dr. Hoadley previously served as director of the Division of Health Financing Policy for the Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation; as principal policy analyst at MedPAC and its predecessor organization, the Physician Payment Review Commission; and as senior research associate with the National Health Policy Forum. His research expertise includes health financing for Medicare, Medicaid, and the Children's Health Insurance Program (CHIP); pharmaco-economics and prescription drug benefit programs; and private sector insurance coverage. Dr. Hoadley has published widely on health care financing and pharmaco-economics and has provided testimony to government panels.

Herb B. Kuhn is current president and chief executive officer of the Missouri Hospital Association (MHA), the trade association serving the state's 176 hospitals and health systems. Before joining MHA, Mr. Kuhn served in multiple roles at the Centers for Medicare & Medicaid Services, including deputy administrator from 2006 to 2009 and director of the Center for Medicare Management from 2004 to 2006. From 2000 to 2004, Mr. Kuhn served as corporate vice president for the Premier Hospital Alliance, serving 1,600 institutional members. From 1987 through 2000, Mr. Kuhn worked in federal relations with the American Hospital Association. Mr. Kuhn received his bachelor of science in business from Emporia State University.

George N. Miller Jr., M.H.S.A., has, over the past two decades, managed a series of hospitals, leading financial turnarounds at four of them. Mr. Miller is chief executive officer of CommUnityCare, a network of health centers in Travis County, Texas. Previously, he was the chief executive officer of Okmulgee Memorial Hospital in Okmulgee, OK; the president and chief executive officer of First Diversity Healthcare Group, a national health care consulting firm helping health care organizations improve their operations; and the regional president and chief executive officer of Community Mercy Health Partners and senior vice president of Catholic Health Partners, a hospital chain in the Springfield, OH, area. He has run hospitals in Illinois, Oklahoma, Texas, and Virginia and is a past president of the National Rural Health Association. Mr. Miller has been an adjunct professor for the Master's of Health Care Services Administration for Central Michigan University since 1998. He has an undergraduate degree in business administration from Bowling Green State University and a master of science in health services administration from Central Michigan University.

Mary Naylor, Ph.D., R.N., F.A.A.N., is the Marian S. Ware professor in gerontology and director of the NewCourtland Center for Transitions and Health at the University of Pennsylvania School of Nursing. Since 1989, Dr. Naylor has led an interdisciplinary program of research designed to improve the quality of care, decrease unnecessary hospitalizations, and reduce health care costs for vulnerable community-based elders. Dr. Naylor is also the national program director for the Robert Wood Johnson Foundation program, Interdisciplinary Nursing Quality Research Initiative, which is aimed at generating, disseminating, and translating research to understand how nurses contribute to quality patient care. She was elected to the National Academy of Sciences Institute of Medicine

in 2005. She also is a member of the RAND Health Board and the National Quality Forum Board of Directors and is the founding chair of the Board of the Long Term Quality Alliance. Dr. Naylor received her M.S.N. and Ph.D. from the University of Pennsylvania and her B.S. in nursing from Villanova University.

David Nerenz, Ph.D., is director of the Center for Health Policy and Health Services Research at the Henry Ford Health System in Detroit, MI, as well as director of outcomes research at the Neuroscience Institute and vice chair for Research in the Department of Neurosurgery at Henry Ford Hospital. He has served on the National Committee for Quality Assurance's Culturally and Linguistically Appropriate Services Workgroup and on the Accountable Care Organization Technical Advisory Committee of the American Medical Group Association. Dr. Nerenz has served in various roles with the Institute of Medicine, including as chair of the Committee on Leading Health Indicators for Healthy People 2020. He serves on the editorial boards of *Population Health Management and Medical Care Research and Review*.

Rita Redberg, M.D., is professor of clinical medicine at the University of California at San Francisco (UCSF) Medical Center, in San Francisco, CA. A cardiologist, Dr. Redberg is also director of Women's Cardiovascular Services at the UCSF National Center of Excellence in Women's Health and adjunct associate at Stanford University's Center for Health Policy/Center for Primary Care and Outcomes Research. She is editor of *JAMA Internal Medicine* and chairperson of CMS's Medicare Evidence Development and Coverage Advisory Committee. Dr. Redberg has served in numerous positions on committees of the American Heart Association and the American College of Cardiology and was a Robert Wood Johnson Health Policy Fellow.

Craig Samitt, M.D., M.B.A., is president and CEO of HealthCare Partners, a subsidiary of DaVita HealthCare Partners. He is also a chair-emeritus of the Group Practice Improvement Network and previously served as an advisory and faculty member of the Centers for Medicare & Medicaid Services' Accountable Care Organization Accelerated Development Learning Sessions. His prior positions include chief executive officer of Dean Health System, Inc., in Madison, WI; chief operating officer of the Fallon Clinic in Massachusetts; senior vice president at Harvard Pilgrim Health Care; and chairman of medicine and executive director of the Kenmore Center at Harvard Vanguard Medical Associates.

Cori E. Uccello, F.S.A., M.A.A.A., M.P.P., is senior health fellow of the American Academy of Actuaries, serving as the actuarial profession's chief public policy liaison on health issues. Ms. Uccello focuses on issues related to health insurance financing, coverage and market reforms, and risk-sharing mechanisms. She recently served as a member of the Technical Review Panel on the Medicare Trustees' report. Before joining the academy in 2001, she was a senior research associate at the Urban Institute

where she focused on health insurance and retirement policy issues. She previously held the position of actuarial fellow at the John Hancock Life Insurance Company. Ms. Uccello is a fellow of the Society of Actuaries and a member of the American Academy of Actuaries. She received an undergraduate degree in math and biology from Boston College and a master's degree in public policy from Georgetown University.

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