CHAPTER 4

Refining the hospital readmissions reduction program

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Chapter summary

In 2008, the Commission reported on a series of payment reforms to encourage care coordination among physicians, hospital administration, and providers outside the hospital. These initiatives included testing the bundling of payments around an episode, gainsharing between hospitals and physicians, and a direct incentive to reduce hospital readmissions. While not all readmissions can be prevented, there is a concern that Medicare readmission rates have consistently been too high and could be lowered through greater coordination of care.

Following the Commission's report and a series of studies illustrating the problem of readmissions, the Congress enacted a readmissions reduction program in 2010. The program includes a penalty that eventually reduces Medicare payments in 2013 to hospitals that had above-average readmission rates from July 1, 2008, through June 30, 2011. There was a small decline in risk-adjusted readmission rates, with the condition-adjusted readmission rate declining by roughly 0.7 percentage point from 2009 to 2011. CMS has reported further improvements from 2011 to 2012 (Blum 2013). While readmission rates have declined slightly, 12.3 percent of all 2011 Medicare admissions were still followed by a potentially preventable readmission (using the 3M algorithm discussed in the online appendix to this chapter, available at http://www.medpac.gov). The rates ranged from 9.9 percent for the hospital at the 10th percentile of the distribution to 15.3 percent at the 90th percentile

In this chapter

of the distribution. Continued financial incentives can play a role in bringing these rates down further. As we have seen, the readmission policy has pushed hospitals to look beyond their walls and improve care coordination across providers to reduce readmissions. Given the positive effects of financial incentives, the Commission finds the policy should be refined and continue.

The current readmission penalty is one step forward in a series of steps to improve care coordination and care outcomes for Medicare patients. However, computation of readmissions rates and of the penalty could be refined to address four issues with the current policy:

- Aggregate penalties remain constant when national readmission rates decline.
- Single-condition readmission rates face significant random variation due to small numbers of observations.
- Heart failure readmission rates are inversely related to heart failure mortality rates.
- Hospitals' readmission rates and penalties are positively correlated with their low-income patient share.

In this chapter, we discuss ways to overcome these four issues. Several principles guided our work. First, any change should maintain or increase an average hospital's incentive to reduce readmissions. We want to encourage hospitals to continue to work with providers outside the hospital's walls to improve care transitions and reduce readmissions. Second, a policy change ideally would increase the share of hospitals that have an incentive to reduce readmissions. Currently, low-volume hospitals do not have much incentive to invest in reducing readmissions because of the way their readmission rates are computed. In addition, some hospitals that face the maximum penalty may not believe they can reduce readmissions enough to lower the penalty. Third, we want penalties to be a constant multiple of the costs of readmissions; in this way, lower readmission rates would benefit both patients (by avoiding readmissions) and hospitals (by incurring lower penalties). Fourth, policy revisions should not cause increased Medicare spending relative to current law. The end goal is to see a decline in readmissions, a decline in the penalties hospitals pay, and a decline in Medicare spending on readmissions.

Specifically, we discuss ways to:

- Have a fixed target for readmission rates. Penalties would go down when industry performance improves.

- Use an all-condition readmission measure to increase the number of observations and reduce random variation.
- Use an all-condition readmission measure to limit the concerns regarding the inverse relationship between heart failure mortality rates and readmission rates. In the longer term, we could pursue a joint readmission–mortality measure.
- Evaluate hospital readmission rates against a group of peers with a similar share of poor Medicare beneficiaries as a way to adjust readmission penalties for socioeconomic status.

These actions would require legislative changes because the current formula used to compute the readmissions penalty is set in law. ■

Introduction

In 2008, the Commission reported on a series of payment reforms to encourage care coordination among physicians, hospital staff, and providers outside of hospitals (Medicare Payment Advisory Commission 2008). Those initiatives include testing payment bundling around an episode of care and a direct incentive to reduce readmissions. The Commission also recommended giving hospitals and physicians the option of setting up gainsharing arrangements to share in savings that result from improved processes of care that benefit patients and reduce costs. These initiatives were designed to give providers an incentive to coordinate care in ways that improve quality and reduce the cost of services.

While no hospital employee or physician wants to see patients readmitted, there was a concern that too few resources were put into reducing readmissions. In particular, there was a concern that hospital employees and physicians were not spending time to coordinate care with post-acute care providers and primary care physicians. Readmission penalties are a way to encourage providers to take responsibility for the continuity of care provided to their patients.[1]

Following the Commission's 2008 recommendations, the Congress enacted a readmission penalty as part of the Patient Protection and Affordable Care Act of 2010. CMS implemented the hospital readmissions reduction program (HRRP) in October 2012. The HRRP reduces payments to hospitals that had excess readmissions during the prior three years and thereby creates an incentive for hospitals to improve coordination of care and reduce readmissions starting in 2010. The aggregate amount of penalties across hospitals in 2013 will be equal to 0.3 percent of aggregate operating payments. Each hospital's individual risk is limited in fiscal year 2013 because its total penalty is capped at 1 percent of inpatient base operating payments. The cap increases to 2 percent in 2014 and to 3 percent in 2015; it stays at 3 percent thereafter.

There is evidence that readmission rates are too high in the United States and can be lowered. Historically, almost 19 percent of Medicare discharges were followed by a readmission within 30 days (Jencks et al. 2009). Since implementation of the readmission penalty in 2013, there has been a flurry of activity within hospitals and the academic community regarding readmissions. Several hospital-initiated efforts suggest there is room for improvement in readmission rates (Jack et al. 2009, McCarthy 2012, Rennke et al. 2013, Robert Wood Johnson Foundation 2013a, Robert Wood Johnson Foundation 2013b). International comparisons similarly suggest a need for improvement. For example, 30-day postdischarge readmission rates for ST segment elevation myocardial infarction were 68 percent higher in the United States than the average for European countries from 2006 through 2008 (Kociol et al. 2012). While there is room for improvement, there remains a question of how to best motivate that improvement.

After the Commission's 2008 recommendation was published and readmission rates were publicly reported, there has been a strong upsurge in hospitals' efforts to reduce readmissions. These efforts include improving the process within the hospital to reduce complications as a way to indirectly prevent readmissions (Silow-Carroll et al. 2011); scheduling follow-up visits, reconciling medications before discharge, and utilizing case managers for complex cases (Jack et al. 2009, Kanaan 2009); and providing better transition planning and execution through enhanced communication among providers and encouraging patient education and self-management (Naylor et al. 2011). For patients with low cognitive function or poor health literacy, hospitals have bolstered their efforts by creating a postdischarge plan that is comprehensible to both patient and caregiver and offering the guidance of a health coach (Chugh et al. 2009, Parry and Coleman 2010). Some hospitals have focused on coordination with skilled nursing facilities, rehabilitation facilities, and other post-acute care providers and have supported interventions by pharmacists, home health nurses, and skilled nursing facilities to prevent further hospitalizations after a patient has been discharged (Bellone et al. 2012, Kanaan 2009).

The benefits of a program to reduce readmissions accrue to both the beneficiary and the Medicare program. The benefits for the patient are improved care in the hospital, more help transitioning from the hospital to other settings, better coordination among the patient's providers outside the hospital, and avoiding an unnecessary hospital stay. Recent literature suggests "In old age, cognitive functioning tends to decline substantially after hospitalization even after controlling for illness severity and pre-hospital cognitive decline" (Rockwood 2012, Wilson et al. 2012). Therefore, avoiding an unnecessary hospital stay may be good in itself. We cannot quantify the benefit to the patient, although a "healthy days at home" measure may be a useful indicator.[2]

TABLE 4–1 **Hospital readmission rates across all conditions declined from 2006 to 2011**

Readmission measure	All-condition readmission rate						Percentage point change in readmission rate	
	2006	2007	2008	2009	2010	2011	2006–2008	2009–2011
All cause	16.0%	16.1%	15.7%	15.6%	15.5%	15.3%	–0.3	–0.3
PPR	13.4	13.2	13.0	13.0	12.5	12.3	–0.4	–0.7

Note: PPR (potentially preventable readmission). Readmission rates reflect the shift in patients admitted to hospitals and their likelihood to be readmitted within 30 days after controlling for age, sex, and diagnosis related group. Raw readmission rates without any exclusions for planned readmissions or readmissions on readmissions had an average rate of roughly 19 percent. All-cause readmissions reflect all readmissions across all conditions for any cause. To make the all-cause measure comparable to the PPR measure, we excluded any "chains" of readmissions, meaning we counted only one readmission if a person was readmitted multiple times within 30 days. Readmissions are for all Medicare patients at all hospitals paid under the inpatient prospective payment system.

Source: MedPAC analysis of 2006 to 2011 Medicare claims files.

The benefit to the Medicare program can be quantified and has two parts: forgone spending on the avoided readmissions and any revenue from penalties on hospitals with excessive readmission rates. The latter, in terms of financial benefits, is far less substantial than the former. Under the current policy, penalties of about $300 million will accrue in 2013, whereas potential savings from reducing avoidable readmissions by even 10 percent would achieve savings of $1 billion or more. In this case, better outcomes align with greater savings: That is, the good outcome for the patient (avoiding unnecessary readmissions) is also the best financial outcome for the Medicare program.

Hospitals clearly want to improve care and reduce readmissions. However, there is a concern that in the competition for limited hospital resources, hospitals may choose to allocate funds to revenue-generating or market-share-expanding projects rather than readmissions reduction projects that result in lower hospital revenue. For hospitals to have an effective financial incentive to reduce readmissions, the penalty for not meeting reduction targets would have to be greater than the incremental cost of reducing readmissions and the lost marginal profit from those readmissions. The current penalty structure has a strong incentive to fund proven strategies that can reduce excess readmissions for target populations in the three conditions covered by the policy. Any refinements to the readmission policy should be done so that the penalty for excess readmissions continues to be large enough to induce hospitals to spend funds to improve the quality of care in ways that also reduce the hospitals' readmissions revenues.

Recent trends in efforts to reduce readmission rates

In June 2008, the Commission evaluated Medicare readmissions using a 3M algorithm that separates readmissions into those that are deemed unrelated to the prior admission and those that possibly could have been prevented. The finding from this methodology is that roughly 13 percent of all 2009 admissions were followed by a readmission that could possibly have been prevented. While these readmissions are potentially preventable, it does not mean that they can all be prevented or that we expect readmission rates to fall to zero (3M Health Information Systems 2008).[3] However, we do believe that a significant share of potentially preventable readmissions can be prevented and the average readmission rates can be lowered. A look at readmission rates over a recent five-year period shows that rates across acute care hospitals have declined slightly. Table 4-1, based on our analysis of Medicare claims data, shows the trend from 2006 to 2011 for readmissions for all Medicare patients at all hospitals paid under the inpatient prospective payment system (IPPS). The readmission rate in this analysis is an "all-condition" measure, which means the rate is for all patients discharged regardless of the diagnosis under which they were admitted or discharged.[4] The rates were adjusted for changes in patient demographics (age and sex) and diagnosis related group (DRG) over the years. If rates are not adjusted, a shift in patient mix could affect the underlying aggregate readmission rate and mask any improvement or degradation in hospital performance.

TABLE 4–2 **Hospital readmission rates for three conditions declined from 2009 to 2011**

Readmission measure	2009	2010	2011	Percentage point change 2009–2011
All cause				
AMI	22.0%	21.4%	21.3%	–0.7
Heart failure	24.9	24.7	24.2	–0.6
Pneumonia	17.5	17.2	17.0	–0.5
PPRs				
AMI	17.7	17.0	16.6	–1.1
Heart failure	19.8	19.2	18.8	–1.0
Pneumonia	13.2	12.8	12.5	–0.7

Note: AMI (acute myocardial infarction), PPR (potentially preventable readmission). The Yale–CMS method was used to compute all-cause data on an annual (not 3 year) basis. All-cause readmissions reflect all readmissions across all conditions for any cause. The 3M method was used to calculate PPR data. Readmission rates reflect the mix of patients admitted to hospitals and their likelihood to be readmitted within 30 days after controlling for age, sex, and diagnosis related group. Readmissions are for all Medicare patients at all hospitals paid under the inpatient prospective payment system.

Source: MedPAC analysis of 2009 to 2011 Medicare claims files.

As shown in Table 4-1, we examined the data from two perspectives. The first is an all-cause readmission measure across all conditions for any cause; it does not try to distinguish between potentially preventable readmissions and other readmissions. It reflects the first readmission after an index readmission and is adjusted for type of admission. The all-cause adjusted readmission measure shows a decline from a rate of 16.0 percent in 2006 to 15.3 percent in 2011.

Starting in 2009, the Medicare Hospital Compare website began publishing readmission rates for three conditions (acute myocardial infarction (AMI), heart failure, and pneumonia). In addition, the HRRP, passed in 2010, signaled hospitals' need to prepare for implementation of the penalty provision in 2013. One might conclude that the incentive to decrease readmission rates would be greater in the latter period. However, we found that the decline from 2009 to 2011 was similar to the decline in earlier years (2006–2008), at 0.3 percent.

The second measure we used to examine readmission rates is labeled in Table 4-1 as potentially preventable readmission (PPR). It counts only those readmissions that the algorithm (which was developed by panels of physicians) considers to be potentially preventable. By this measure, there was a greater decline in the readmission rate (in absolute and relative terms) and the decline was greater in the 2009 to 2011 period. By 2011, the average PPR was 12.3 percent, with the hospital at the 10th percentile having a rate of 9.9 percent and the hospital at the 90th percentile having a rate of 15.3 percent. Depending on which measure one uses, the pace of improvement has either stayed the same or increased through 2011. Recently, CMS reported that rates fell further from 2011 to 2012; we have not examined those data (Blum 2013).

Hospital Compare reports hospital-specific readmission rates for three conditions: AMI, heart failure, and pneumonia. These conditions are of interest not only because they are common conditions with relatively high readmission rates but also because they are the three conditions specified in the readmission policy beginning in October 2012. These analyses, however, fail to account for changes in the mix of patients over time and use a three-year average of the readmission rate. A three-year average is necessary at the hospital level to help generate enough cases to be statistically valid; in contrast, at the national level, annual rates can be computed to evaluate recent changes in readmissions. Table 4-2 shows how annual readmission rates have changed for these three conditions at the national level after controlling for patient age, sex, and DRG.

Using the all-cause measure for the three conditions reported by CMS (but adjusted for type of DRG within the diagnosis), each of the three reported conditions had

a larger decrease in readmission rates from 2009 to 2011 than the –0.3 average for all conditions. This result could reflect the effect of public reporting and possibly the prospect of the HRRP on hospital behavior. Notably, PPRs decreased more than all-cause readmissions from 2009 to 2011 (Table 4-2). The bigger drop in PPRs could suggest that most of the decline in readmissions came from a reduction in PPRs, which could lend some face validity to the identification of those readmissions as potentially preventable. One would expect that hospitals could more readily prevent readmissions that are potentially preventable than those that may be planned or unrelated to the index admission.

HRRP increased the incentive to reduce readmissions

With passage of the HRRP in 2010, hospitals that have an excess number of Medicare readmissions for selected conditions in the prior three years will have their IPPS payments reduced (hospitals not paid under IPPS, such as critical access hospitals, are not subject to the policy). In fiscal years 2013 and 2014, the readmissions reduction program applies to three conditions: AMI, heart failure, and pneumonia. In fiscal year 2015, the program will be expanded to at least four additional conditions, including chronic obstructive pulmonary disease, coronary artery bypass graft surgery, percutaneous transluminal coronary angioplasty, and other vascular conditions as well as other conditions the Secretary deems appropriate. The penalty is computed based on readmission rates for the most recent three years of data available; therefore, the 2013 penalties were based on data for 2009, 2010, and 2011.

A hospital's readmission performance is measured using the National Quality Forum (NQF)–endorsed risk-adjusted 30-day readmission measures for AMI, heart failure, and pneumonia. The 30-day measure is essentially the same measure as reported on the Hospital Compare website, except that readmissions to Veterans Health Administration hospitals and critical access hospitals are not included.

- Risk adjustment is based on the use of hierarchical regression models using selected hierarchical condition categories to adjust for patient characteristics.
- Measures are for all-cause readmissions for beneficiaries age 65 or older with limited exclusions, such as planned readmissions for patients with AMI.
- Three years of claims data—July 2008 through June 2011—are aggregated to judge hospitals' readmission performance.
- Hospitals must have at least 25 initial admissions for a given diagnosis to be measured.
- Conditions identified are based on the principal discharge diagnosis, which is not necessarily the DRG assigned to the case for payment.

Under the HRRP, hospitals that have Medicare risk-adjusted readmission rates for any of the three conditions greater than the national average rates for those conditions (defined as "excess" readmissions) will have their 2013 IPPS payment rates reduced. The payment penalty will be collected by implementing a payment reduction for all Medicare discharges. The penalty is calculated as a percentage of a hospital's base operating payments and therefore does not reduce hospitals' indirect medical education, disproportionate share hospital (DSH), special rural (e.g., sole community), or outlier payments.

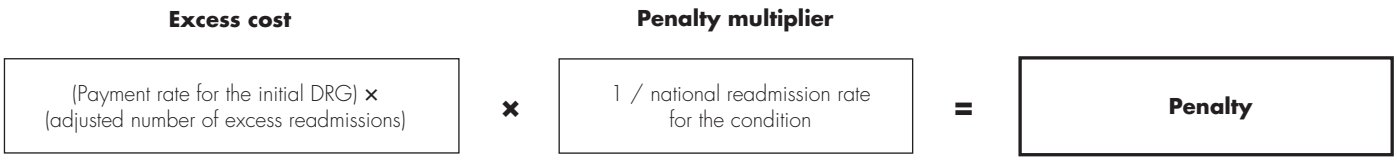
The current readmission penalty formula is complex, but in essence the penalty is computed as the product of a hospital's adjusted cost of excess readmissions and a multiplier. Usually, excess readmissions would be computed as the difference between a hospital's observed readmissions and its expected number of readmissions, given the riskiness of the hospital's patient population. However, the current method for computing excess readmissions does not use the actual observed number of readmissions; instead, it compares the hospital's adjusted number of readmissions with the expected number. The adjusted number is essentially a blend of the hospital's actual observed readmissions for a condition and the national mean readmission rate for the condition, with a larger weight placed on the national mean for smaller hospitals. The reason the current method uses the adjusted number is to limit the effect of random variation in hospitals with small numbers of cases.

Figure 4-1 shows a simplified version of the readmission penalty formula.

For illustrative purposes, consider a hospital with 100 admissions in a DRG for which the national average rate of readmissions is 20 percent. The hospital's expected number of readmissions would be 20. If the hospital's actual number of readmissions were 24 and its adjusted

FIGURE 4–1

Computation of hospital readmission penalty



Note: DRG (diagnosis related group). The derivation of this simplified formula is shown in online Appendix 4-B to this chapter, available at http://www.medpac.gov.

number of readmissions were 22, then the number of excess readmissions would be 2. If the base DRG payment per initial admission were $10,000, the estimated cost of excess readmissions would be $20,000.[5] The second box in Figure 4-1 represents a multiplier that increases the incentive to reduce readmissions. For example, given a 20 percent national average readmission rate for a condition, the multiplier would be 5 (1/0.20). The penalty would be equivalent to five times the cost of the adjusted excess readmissions, or $100,000 in this example. In general, the formula produces penalties that are much higher than Medicare payments for the excess readmissions; this creates a strong incentive to reduce readmissions. However, the full impact of the formula is limited because the penalty is limited to three conditions, and each hospital's penalty is capped at 1 percent of base inpatient operating payments in 2013, 2 percent in 2014, and 3 percent in 2015 and thereafter. The algebra showing that the penalty in law is equivalent to the simplified formula in Figure 4-1 is shown in online Appendix 4-B to this chapter, available at http://www.medpac.gov.

Impact of the HRRP on provider payments

Under current policy, we estimate that the penalty will reduce hospital payments by approximately $300 million, equal to 0.3 percent of base inpatient operating payments for all IPPS hospitals. Roughly 30 percent of all hospitals receive no penalty, 60 percent receive a penalty of less than 1 percent, and 10 percent of hospitals receive the maximum penalty, which was 1 percent in 2013.

To examine how the HRRP's penalties vary by hospital group, we examined a sample of 3,006 hospitals that had three years of complete data and over 1,000 total Medicare discharges across all conditions (Table 4-3, p. 100). We found major teaching hospitals have the highest average penalty at 0.45 percent of base operating payments and also have the largest share of hospitals at the penalty cap at 18 percent. In contrast, hospitals that receive no indirect medical education and no DSH payments have smaller average penalties at 0.24 percent, with 40 percent receiving no penalty and just 7 percent at the 1 percent penalty cap. Small hospitals, those with fewer than 100 beds, also have a lower average penalty, 0.28 percent with 39 percent receiving no penalty at all. The larger share of small hospitals receiving no penalty is in part due to these hospitals being less likely to have the minimum 25 AMI cases that make them subject to a potential penalty.

Despite these rather large differences in the readmission penalty as a share of base operating payments, the differences as a share of total payments are much smaller. This is because hospitals that are more likely to receive higher penalties also are more likely to receive higher supplemental payments such as indirect medical education, DSH, and outlier payments. Thus, payment reduction across hospitals does not vary much, ranging from 0.22 percent for government hospitals to 0.28 percent for major teaching hospitals.

A hospital's financial incentive to direct resources to reducing readmissions depends on the size of the penalty relative to the lost marginal profit from readmissions. At present the size of the penalty is significant for the three conditions measured but relatively small overall because the readmission program is computed on only three conditions and is capped at 1 percent. As the number of conditions expands, the size of the penalty will increase.

TABLE 4–3 **Hospitals affected by readmission payment penalty, 2008–2010**

Hospital group	Average penalty* as a share of operating payments	Share of hospitals at 1% penalty cap	Share of hospitals with no penalty	Average payment reduction* as a share of all payments
All	0.31%	10%	29%	0.24%
Urban	0.30	9	28	0.23
Rural	0.34	13	33	0.28
Nonprofit	0.31	10	31	0.24
For profit	0.33	10	25	0.26
Government	0.30	10	29	0.22
Major teaching	0.45	18	11	0.28
Other teaching	0.27	7	31	0.21
Nonteaching	0.31	10	31	0.25
IME and DSH	0.33	10	25	0.23
IME only	0.29	7	30	0.25
DSH only	0.32	11	29	0.26
No IME or DSH	0.24	7	40	0.22
Number of beds				
< 100	0.28	10	39	0.24
100–299	0.32	10	23	0.22
300+	0.33	10	27	0.28
Occupancy rate				
< 50%	0.28	9	37	0.22
50%–75%	0.31	9	27	0.24
75%+	0.43	15	16	0.31

Note: IME (indirect medical education), DSH (disproportionate share hospital).
*Average penalty is computed as a share of base operating payments and average payment reduction is computed as a share of total inpatient payments, which include IME payment, DSH payments, and outliers. Averages are based on hospital weighted averages. Analysis is limited to the 3,006 inpatient prospective payment system hospitals with at least 1,000 discharges from 2008 through 2010.

Source: MedPAC analysis of 2010 Medicare claims and October 3, 2012, CMS readmission impact file.

Addressing long-term issues with the readmission policy

The purpose of the hospital readmission policy is to create an incentive for hospitals to improve care coordination and reduce readmission rates. While the current policy corrects for the perverse incentives that previously discouraged hospitals from acting to reduce readmissions, several issues remain with how the current penalty is computed: the effect of random variation on hospitals with small numbers of cases, the inability of the industry to reduce average penalties with improved performance, the correlation of patient income and readmission rates, and the inverse relationship between readmissions and mortality for cardiac patients. To address these issues, we developed several refinement options guided by four principles—namely, that an improved policy should:

- maintain or increase an average hospital's incentive to reduce readmissions.
- increase the share of hospitals that have an incentive to reduce readmissions.
- make penalties a constant multiple of the costs of readmissions.
- not increase expected Medicare expenditures above current law.

TABLE 4–4 **Hospital readmission policy issues and potential solutions**

Concern	Description of the problem	Proposed solution
Random variation and small number of observations	It is difficult to distinguish between random variation and true performance when examining a small number of cases for a small number of conditions.	• Use all-condition readmissions. • Use 3 years of data. • Allow hospitals to aggregate performance within a system.
Computation of the penalty multiplier	• Penalty remains constant as industry readmission rates improve. • Penalty is a different multiplier of excess readmission cost for each condition.	Drop the multiplier and set the penalty equal to the cost of excess readmissions, use all-condition readmissions, and lower the readmission targets below the national average to maintain budget neutrality with the current policy if readmission rates do not decline.
Heart failure readmissions negatively correlated with heart failure mortality	Some hospitals may be more likely to receive a penalty if they have low mortality or if they have high admission rates of low-severity patients.	Use an all-condition measure, which has less of a negative correlation.
Correlation between SES and readmission rates	Lower income patients have higher readmission rates.	• Report all hospital risk-adjusted rates without an SES adjustment. • Compute targets for the purposes of the penalty for peer groups of hospitals with similar low-income shares (SSI beneficiaries).

Note: SES (socioeconomic status), SSI (Supplemental Security Income).

Table 4-4 summarizes the problems with the current policy and presents proposed solutions. We then address each of these issues and the proposed solution in detail. In essence, our combination of solutions shifts the current policy's measurement of readmission rates for specified conditions to one that measures readmission rates for all conditions against a predetermined readmission target. These changes address most of the shortcomings in the current policy, including the issues of random variation due to small sample size, computation of the penalty, and the negative correlation between mortality and readmissions. Another refinement—computing separate target rates for peer groups of hospitals—is designed to address the positive correlation between shares of low-income patients and readmission rates. These changes would require changes in law because the current readmissions penalty formula is set in law.

Issue 1: Random variation and small numbers of observations

One concern with any incentive program that penalizes hospitals with poor outcomes is that hospitals with a small number of cases may receive a penalty because of random variation—that is, variation in outcomes not associated with quality of care or factors in the risk-adjustment models. To address this issue, the Yale method used by CMS does not compare actual outcomes with expected outcomes. It compares "adjusted actual" readmissions with expected readmissions. Adjusted actual outcomes are computed using a random effects hierarchical model. From a practical standpoint, this is equivalent to blending the hospital's own actual readmission rate with the average rate in the country. Large hospitals are judged mostly on their own performance, but small hospitals' adjusted actual weights are based primarily on the national mean readmission rate.

A concern raised with this approach is that it shrinks all readmission rates toward the mean. This reduces the odds of correctly or incorrectly identifying a small provider as having high readmission rates, thereby muting the effect of a hospital's relatively poor (or good) performance. Such blending reduces hospitals' incentives to reduce readmissions, as their scores only partially depend on their performance and thus they receive only partial credit for any improvement. A more complete discussion of how CMS moves reported readmission rates toward the mean is

available from CMS with evaluations of the method in the literature (Ash et al. 2011, Department of Health and Human Services 2010, Mukamel et al. 2010, Silber et al. 2010).

Alternative solution to the small numbers problem

A more practical solution to the problem of small numbers of observations is to increase the number of observations being evaluated. This solution would reduce random variation and increase the incentive to reduce readmissions. Currently, CMS evaluates readmission rates of each condition individually. A median hospital has only about 70 patients for AMI and 250 observations for heart failure (Table 4-5). The result is a great deal of random variation in these condition-specific readmission rates, which is why CMS then shrinks any variation from the national mean toward the national mean. However, this technique can hide true differences and reduces incentives.

An alternative is to use an all-condition measure of readmissions using three years of data (last column of Table 4-5).[6] Under this measure, the median hospital would have about 5,000 observations and more than 90 percent of hospitals would have a sample of over 1,100 discharges with which to judge their readmission rates (Table 4-5). Given this sample size, there would be 95 percent confidence that the true readmission rate would not be less than 1.7 percentage points below the reported readmission rate. This alternative would eliminate the need to shrink values toward the national mean.[7]

If some hospitals (e.g., small hospitals) were still concerned about random variation, the policy could allow hospitals to report results jointly with other hospitals if they wanted to avoid the risks of random variation. For public reporting, each hospital would still have its own performance reported if it had more than 100 observations. However, when computing penalties, CMS would aggregate data from a group of hospitals and jointly evaluate that rate of excess readmissions.[8] This procedure would make hospitals' financial performance dependent on the readmissions of other hospitals in a voluntary group and create incentives for hospitals to share best practices and jointly work with post-acute care providers to improve transitions.

Issue 2: Computation of readmission penalty

The HRRP produces a penalty that is more than four times the cost of the reported excess readmissions in the three conditions covered under the policy. Some industry observers have suggested that this penalty multiplier was simply a drafting error in the legislation, with the implication that it should be removed from the formula (Premier Healthcare 2012). However, others see the penalty multiplier as increasing the incentive to reduce readmissions. To create a financial incentive for a hospital to act, the penalty needs to be greater than a hospital's marginal profit from the excess readmissions for the three conditions. This is especially true given that, under the current method of computing excess readmissions, the level of excess admissions for any individual hospital is "shrunk" toward zero, depending on the number of observations. Therefore, given the current computation of the cost of excess readmissions, a penalty multiplier may be needed to induce hospitals to reduce readmissions and lose the revenue associated with those readmissions. The current penalty produces four to five times the revenue received from excess readmissions for the three conditions.

Even if the average magnitude of the penalty is reasonable to generate a material incentive to change behavior and offset the effect of shrinking excess readmissions, the way the penalty is structured in law creates four problems in the long run:

- Under the current formula (penalty = cost of excess readmissions × (1/national readmission rate)), if the national readmission rate goes down, an average hospital's readmission penalty will remain roughly constant. The decrease in the cost of excess readmissions in the formula is offset by the increase in the multiplier in the formula. (For an example, see online Appendix 4-B to this chapter, available at http://www.medpac.gov.)
- For lower readmission rate conditions brought into the readmission policy in the future, there will not be equity across hospitals because hospitals that provide the types of care that have lower readmission rates will have larger penalties. For example, all else equal, the penalty for one excess readmission for a condition with a 5 percent national readmission rate will be five times the penalty for one excess readmission for a condition with a 25 percent national readmission rate.
- Hospitals do not have a known readmission target, because the future average risk-adjusted readmission rate (not the past rate) acts as the benchmark.
- Because a hospital's penalty will increase if other hospitals lower their readmission rates more than it does, there is not an incentive for hospitals to cooperate with each other to reduce rates.

TABLE 4–5 **Using an all-condition measure over three years reduces random variation and addresses the small number of observations problem**

	Number of cases (measured over 3 years)			
	Current 3-condition policy			Proposed all-condition measure
Percentile	AMI	Heart failure	Pneumonia	
10th	10	60	60	1,170
Median	70	250	230	5,170
90th	410	810	580	16,480

Note: AMI (acute myocardial infarction).

Source: MedPAC analysis of Medicare claims data 2008 to 2010.

These four problems with the penalty are not critical in the short term because the current policy includes only three conditions with relatively high readmission rates and the penalty is capped in 2013 and 2014 at 1 percent and 2 percent, respectively, of base operating payments. However, when conditions with low readmission rates are included in the policy and if the industry significantly lowers the national average readmission rates, a change to the formula may be appropriate to avoid unduly penalizing hospitals if industry readmission performance improves.

Replacing penalty multiplier with a prospective target

The current readmission penalty could be revised to eliminate the multiplier and also set a fixed readmission target. This change would allow readmission penalties to decline as industry performance improves. However, eliminating only the penalty multiplier while continuing to limit the policy to three conditions would diminish the financial incentive to reduce readmissions and would increase Medicare spending. To expand the incentive to a broader spectrum of readmissions and avoid increases in Medicare spending, there could be two additional changes. First, CMS could move to an all-condition readmission measure. This change would increase the number of conditions subject to the incentive and encourage system-wide changes to improve care coordination (Naylor et al. 2012). Second, the target level of admissions could be based on past national averages. For example, the target could be the readmission rate for hospitals at the 40th percentile from a specific year, such as 2011. Such a target rate could be set to accomplish two goals: First, under the set target, hospitals would know they could avoid penalties if they reached the target. Second, Medicare program savings would be guaranteed through reduced readmissions or through higher penalties. For example, if all hospitals reduced readmissions below the target (such as the 40th percentile of the 2011 readmission rates), no hospital would receive a penalty. Instead, savings would be generated from fewer rehospitalizations. In contrast, if hospitals' readmissions did not meet the target, savings would come from the penalty imposed. From this point forward in this chapter, we use a target equal to the 40th percentile of historic readmission rates for illustration, but the Commission is not endorsing any particular target.

Table 4-6 (p. 104) contrasts penalties under the current policy (columns 3 and 5) with a revised policy using an all-condition measure and a prospective target (columns 4 and 6). Under current policy, readmission penalties stay roughly the same even after readmission rates are reduced. For example, the average penalty for a hospital in the 6th decile of potentially preventable readmissions (12.9 percent readmission rate) is currently 0.34 percent. Even after a 10 percent reduction in readmissions, the penalty would still be roughly the same (0.34 percent). This is because under current policy, benchmarks move as industry performance improves. Therefore, roughly half of all hospitals will be penalized for each condition covered by the policy. One concern is that some hospitals with high readmission rates may not see a way to reduce rates faster than everyone else and would choose to simply accept the penalty rather than invest in efforts to reduce readmissions.

Alternatively, CMS could use an all-condition measure with a prospective target. Table 4-6 (column 4) shows what would happen if the target were set at the 40th percentile of historic rates. If there were no reduction in readmission rates, 40 percent of hospitals would not face

TABLE 4–6

Under revised hospital readmission policy, penalties would decline as industry performance improved

All-condition readmission decile	Average risk-adjusted potentially preventable readmission rate	Simulation of no improvement in readmission rates		Simulation of 10 percent reduction in readmission rates by all hospitals		
		Current policy penalty	All-condition prospective target penalty	Current policy penalty	All-condition prospective target penalty	Readmission reduction savings
1	9.6%	0.02%	0.00%	0.02%	0.00%	0.79%
2	10.9	0.06	0.00	0.05	0.00	0.93
3	11.6	0.12	0.00	0.12	0.00	1.02
4	12.0	0.17	0.00	0.17	0.00	1.06
5	12.5	0.23	0.23	0.23	0.00	1.09
6	12.9	0.34	0.71	0.34	0.00	1.15
7	13.4	0.37	1.00	0.37	0.01	1.17
8	14.0	0.46	1.00	0.45	0.37	1.25
9	14.9	0.60	1.00	0.59	0.95	1.36
10	17.1	0.73	1.00	0.72	1.00	1.76
Average	12.9	0.31	0.48	0.30	0.21	1.14

Note: Penalties calculated as share of base operating payments. For illustration, the all-condition prospective target was set at the historic 40th percentile.

Source: MedPAC computations using the 3M potentially preventable readmission algorithm and the 2010 MedPAR data for 3,006 inpatient prospective payment system hospitals with over 1,000 discharges from 2008 through 2010.

a penalty and 60 percent would (column 4). In contrast, if hospitals reduced their readmission rates by 10 percent (column 6), all hospitals in the first six deciles would avoid readmission penalties.[9] The average penalty would fall to 0.2 percent of operating payments, well below the 0.3 percent penalty under current law. While penalties are reduced, the Medicare program would realize savings equal to 1.14 percent of operating payments from the 10 percent reduction in readmissions. On net, the reduction in readmissions would result in a better outcome for patients, lower penalties for hospitals, and reduced spending for the program. If there were no reduction in readmissions, the all-condition penalty (without a multiplier) would produce a higher penalty than the three-condition penalty under current law (0.48 percent on average), but this penalty could still be less than what the penalty in current law will be after it is expanded to more conditions in 2015.

Our simulation methods use the 3M all-condition readmission measure. This measure is widely used by hospitals and states. We used it because it was available at the time the data analysis for this chapter began. It would also be possible to use the new all-condition unplanned-readmission measure developed by Yale, which has been endorsed by NQF.[10] We want to stress that use of the all-condition measure to address current issues associated with the current readmission penalty does not depend on which of these two all-condition measures is used. In addition, over time we expect both models to continue to be refined to improve risk adjustment for clinical factors. These measures are compared in online Appendix 4-A to this chapter (http://www.medpac.gov).

In addition to the certainty that comes with a target level of readmission, hospitals would have an increased incentive to work together to reduce readmissions. Penalties would no longer increase when a competitor's readmission rates declined. This approach of moving toward a fixed target is similar to the system introduced by the New York State Medicaid system, which set the target with an expectation of a 24 percent decline in readmissions for each hospital over three years. If New York hospitals meet that target, they avoid readmission penalties on their Medicaid patients.

Issue 3: Relationship between mortality and readmissions

An additional concern regarding readmissions is that for heart failure patients, readmission rates are negatively

TABLE 4–7

Illustration of how low mortality might cause higher readmission rate

	Type of hospital	
	"Saves" patients at greatest risk	**Does not "save" patients at greatest risk**
Patients seen	100	100
Admissions	10	10
Mortality	1 *(1/10 = 10%)*	2 *(2/10 = 20%)*
Readmissions	2 *(2/9 = 22%)*	1 *(1/8 = 12.5%)*

Note: The converse is also true: If hospitals have high mortality rates and their patients who survive have above average resiliency in ways that are not fully picked up by risk adjusters, then readmission rates could be low for those hospitals.

correlated with mortality rates. There are two competing explanations for why it is so. The explanation that has been suggested by some hospital executives is that hospitals with low mortality rates may save some very ill heart failure patients, but these patients are more likely to be readmitted because of factors that are not fully accounted for in the risk-adjusted model (Gorodeski et al. 2010). Table 4-7 illustrates how lower mortality rates might be associated with higher readmission rates. The first hospital has a greater tendency to save patients at the greatest risk. It has 10 admissions and 1 patient dies. Two other patients are discharged and later readmitted. The second hospital admits 10 patients at equal risk as the first hospital's patients. The two at greatest risk die and one is readmitted. As a result, the first hospital has a lower mortality rate and a higher readmission rate than the second hospital. Looking at these two hospitals, one would conclude that mortality and readmissions were negatively correlated.

An alternative hypothesis is that some hospitals are more likely to admit patients than others. Table 4-8 illustrates how admitting a greater number of low-severity patients (specifically, low severity that is not completely picked up by the risk adjuster) than other hospitals could also result in lower mortality and higher readmissions. For example, the first hospital admits a higher percentage of patients seen in its emergency room than the second hospital (12 percent vs. 10 percent). It could admit a heart failure patient who has relatively low severity and does not need inpatient care. This patient may have a low expected mortality rate, lower than can be fully accounted for by risk adjustment. Let us further suppose that the other patients were at equal risk and in both hospitals two patients died; the mortality rate at the first hospital would be lower (17 percent) than the mortality rate at the second hospital (20 percent). Therefore, the liberal admission policy could lead to lower risk-adjusted mortality. At the same time, if four patients return to the emergency room at each hospital and the first hospital admits three while the second hospital admits only two, the liberal admission policy could also lead to a higher readmission rate at the first hospital compared with the second one.

Based on an analysis of data averaged over 3 years for 1,663 hospitals with more than 1,000 Medicare cases, we confirmed the negative correlation between certain mortality and readmission rates. As shown in Table 4-9, p. 106, under the CMS–Yale method (data in the unshaded cells), the magnitude of the correlation is relatively large for heart failure mortality and the three readmission measures, small for pneumonia, and insignificant for AMI. For example, there is a correlation of –0.19 between CMS heart failure mortality and CMS heart failure readmissions. The Yale team that developed the CMS readmission and mortality measures reported similar correlations; they describe the magnitude of the correlation between heart failure mortality and heart failure readmissions as "quite modest" (Krumholz et al. 2013).[11] Others may view the magnitude of the heart failure mortality measure with the four readmission measures as material.

TABLE 4–8

Illustration of how admitting lower severity patients could decrease mortality rate and increase readmission rate

	Type of hospital	
	High admitting	**Low admitting**
Patients seen	100	100
Admissions	12	10
Mortality	2 *(2/12 = 17%)*	2 *(2/10 = 20%)*
Readmissions	3 *(3/10 = 30%)*	2 *(2/8 = 25%)*

Note: This hypothesis also rests on the assumption that risk adjustment is imperfect and admitting relatively healthy patients will not be fully accounted for by the risk adjuster.

TABLE 4–9 High negative correlation between heart failure mortality and readmissions

	CMS AMI readmissions	CMS pneumonia readmissions	CMS heart failure readmissions	3M all-condition readmissions
CMS AMI mortality	0.00	–0.02	–0.02	–0.01
CMS pneumonia mortality	–0.09*	–0.01	–0.07*	–0.06
CMS heart failure mortality	–0.23*	–0.19*	–0.19*	–0.25*
AHRQ 5-condition 30-day mortality	–0.13*	–0.12*	–0.08*	–0.02

Note: AMI (acute myocardial infarction), AHRQ (Agency for Healthcare Research and Quality). We averaged data from 2008 to 2010 for 1,663 hospitals with at least 1,000 Medicare cases in each year. We examined correlations only using hospitals with a fairly large number of cases to eliminate random variation. The AHRQ 30-day mortality measures include heart failure, pneumonia, AMI, stroke, and hip fracture. Unshaded cells indicate they were measured by the CMS–Yale method.
* Significant at the $p < 0.01$ level.

Source: MedPAC analysis of hospital compare and 2008 to 2010 claims data from CMS.

We also looked at the correlations with an Agency for Healthcare Research and Quality (AHRQ) five-condition mortality measure and a 3M all-condition readmission measure. The AHRQ measure is negatively correlated with the three CMS readmission measures, and the magnitude of the negative correlation between the AHRQ method and the various readmission rates is a blend of the first three rows—as one might expect—because it includes those mortality rates plus two others. An interesting finding in our data is that heart failure mortality is correlated with greater readmissions across all categories of readmissions, not just heart failure readmissions. We did not see the magnitude of correlations or the breadth of correlations across conditions for AMI and pneumonia mortality. One possibility is that heart failure admissions are more subject to variations in clinical judgment. It is even more highly negatively correlated (–0.25) with the 3M all-condition readmission measure. It could be that heart failure mortality is a marker for a liberal admissions policy. We plan to conduct more analyses of this and other relationships between mortality and readmissions over the next year.

If the readmission policy moves toward an all-condition measure, the issue of negative correlation with mortality may become attenuated. For example, the 3M all-condition readmission measure is slightly correlated with the AHRQ five-condition 30-day mortality measure (–0.02) but it is not statistically significant. The correlation with an all-condition mortality measure and correlations with respect to the Yale all-condition metric remain to be computed.

In the short term, the issue of negative correlation between mortality and readmission should not delay moving forward with an all-condition readmission measure, given the low correlation with the more inclusive mortality measure. Over the longer term, we are working on developing a joint mortality–readmission measure and may investigate adjusting readmission measures for a hospital's tendency to admit.

Issue 4: Correlation between socioeconomic status and readmission rates

There is a concern that hospitals serving large shares of poor patients tend to have higher readmission rates and that hospitals serving these patients will be more likely to pay readmission penalties (Joynt and Jha 2013a, Joynt and Jha 2013b, Lindenauer et al. 2013). This concern is similar to the concern that poor patients have higher costs of care; the higher cost of serving poor patients is addressed with inpatient DSH payments. In contrast, there is no income adjustment with respect to computing readmission rates or readmission penalties.

Currently, CMS uses a risk-adjustment model developed by a team from Yale that does not adjust for the effect of socioeconomic status (SES) on readmissions. CMS

TABLE 4–10

Readmission penalties are higher for hospitals with more low-income patients, 2008–2010

SSI decile	Share of Medicare patients on SSI	Average readmission penalty in 2013	Share of hospitals at 1 percent penalty cap	Share of hospitals with no penalty
1	0–3%	0.21%	5%	41%
2	3–4	0.23	5	37
3	4–5	0.22	6	43
4	5–6	0.26	7	39
5	6–7	0.29	7	32
6	7–9	0.30	8	27
7	9–10	0.36	10	21
8	10–13	0.40	14	18
9	13–18	0.39	17	21
10	18–74	0.45	20	14
Average	9	0.31	10	29

Note: SSI (Supplemental Security Income). Penalty is calculated as a percentage of base operating payments and thus does not include outlier payments, indirect medical education payments, disproportionate share hospital payments, and special rural hospital specific payments. Penalties are computed as a share of base operating payments.

Source: MedPAC analysis of 2010 Medicare claims files for 3,006 inpatient prospective payment system hospitals with 1,000 discharges in each year between 2008 and 2010 and SSI files from CMS.

and NQF have argued against including race and income as risk adjusters because that would be equivalent to accepting poorer performance by hospitals that serve poorer patients:

> The measure does not adjust for SES or other patient factors such as psycho-social support because we do not want to hold hospitals to different standards of patient care simply because they treat a large number of low SES patients. Moreover, we do not want to mask potential disparities in care or minimize incentives to improve the outcomes of care for disadvantaged populations. This is also consistent with the NQF's position regarding risk adjustment, which is that risk-adjusted measures should not include variables such as SES and race that would adjust away disparities in care. (Centers for Medicare & Medicaid Services 2012)

To test for the effect of SES on readmissions, we evaluated the effect of different factors on readmission rates, including race, patient income, and hospitals' DSH percentage, as used in other research. We found that using hospitals' share of low-income patients was a stronger and more consistent predictor of readmissions than race or the DSH percentage. To adjust for income, we divided hospitals into deciles based on shares of Medicare patients who qualified for Supplemental Security Income (SSI), which is a program for seniors and the disabled with incomes of roughly $1,000 per month or less. This income statistic has the advantage of being based purely on the Medicare patients served at the hospital as opposed to other statistics such as the DSH percentage, which can be influenced by the offering of services such as obstetrics. We found that hospitals with high shares of poor patients (as indicated by their share of Medicare patients on SSI) tended to have higher readmission rates and thus higher penalties under the HRRP. Table 4-10 shows the strong and almost monotonic relationship between SSI and readmission penalties under the current readmission policy. We found similar results when using the 3M method of computing all-condition PPR rates and the Yale all-condition unplanned-readmission measure. Because we see the same effect with the 3M method (not shown) and the CMS–Yale method for computing readmissions, we conclude that the relationship between shares of low-income patients and readmissions is not due to the method for computing readmissions and penalties. Table 4-10 also shows that, while it may be more difficult to reduce

TABLE 4–11

Comparing hospitals with their peers makes penalties similar across hospitals serving patients with different income levels, 2010

SSI decile	Share of Medicare patients on SSI	Current penalty using 3 conditions	Current penalty after mandated expansion to 7 conditions	Simulation using peer group all-condition penalty with a target equal to 40th percentile
1	0–3%	0.21%		0.49%
2	3–4	0.23		0.47
3	4–5	0.22		0.47
4	5–6	0.26	Penalty	0.48
5	6–7	0.29	will increase	0.47
6	7–9	0.30	above	0.47
7	9–10	0.36	2013 levels	0.49
8	10–13	0.40		0.46
9	13–18	0.39		0.49
10	18–74	0.45		0.54
Average		0.31	Over 0.31	0.48

Note: SSI (Supplemental Security Income). The magnitude of the increase in the penalty over the penalty with three conditions will depend on the number of conditions added to the penalty; under current law the number of conditions will at least double. The exact levels of penalties will not be known until CMS adopts risk adjusters for these conditions. All-condition readmission measure is based on 3M potentially preventable readmissions. Penalty is calculated as a percentage of base operating payments and thus does not include outlier payments, indirect medical education payments, disproportionate share hospital payments, and special rural hospital specific payments.

Source: MedPAC analysis of 2010 Medicare claims files and SSI files from CMS.

readmission rates for poorer patients, it is possible to bring rates toward the national average. That is, even among hospitals with the highest share of SSI patients (decile 10), 14 percent do not face penalties in 2013. This amount is consistent with reports of hospitals serving poor patients being able to reduce their readmission rates (Jack et al. 2009, McCarthy 2012).

Potential solution: Evaluate hospitals in relation to their peers

One way to address the issue of readmissions reduction for hospitals with high shares of low-income patients is to compute penalties by comparing hospitals with a peer group serving a similar share of low-income patients. All hospitals would continue to report their all-condition risk-adjusted readmission rate—it would not be adjusted for SES and thus disparities would not be masked. However, when computing penalties, each hospital's target readmission rate would be based on the performance of hospitals with a similar patient profile. For example, the national 40th percentile risk-adjusted readmission rate is 12.1 percent using the 3M computation method. That would be the target for hospitals with an average share of patients on SSI. The target rate for hospitals with only 2 percent of their Medicare beneficiaries on SSI would be lower (11.3 percent) and the target for hospitals with 15 percent on SSI would be higher—the 40th percentile of that group (13.2 percent). Because CMS would report readmission rates without adjustment for income, we would be able to identify disparities, but CMS would reduce the penalties faced by hospitals serving large numbers of poor patients by giving them a higher target readmission rate. In practice, this would have the effect of using one method of risk adjustment for public reporting and a second method when assessing financial penalties (to correct for the problem of hospitals serving poor patients paying disproportionate penalties). Using peer groups to determine penalties and directing additional resources to providers serving poor communities (as discussed below) may help reduce disparities in penalties between hospitals serving poorer and wealthier communities.

Simulating computation of readmission penalties based on peer group comparisons In Table 4-11 we illustrate a way to correct for the problem of hospitals serving poor patients paying significantly higher penalties. Table 4-11

TABLE 4–12

Setting a fixed readmission target for SSI peer groups based on 40th percentile readmission rate for an all-condition readmission measure, 2010

SSI decile ranked by share of Medicare patients on SSI	Current penalty using three conditions, assuming no improvement in readmissions	Simulation of 10 percent reduction in readmission rates by all hospitals			Readmission rate target: 40th percentile of readmission distribution for peer group
		Current penalty	Peer group all-condition penalty	Readmission reduction savings	
0–3%	0.21%	0.21%	0.22%	1.01%	11.3%
3–4	0.23	0.22	0.20	1.04	11.6
4–5	0.22	0.22	0.17	1.05	11.7
5–6	0.26	0.26	0.19	1.10	12.0
6–7	0.29	0.28	0.19	1.09	12.0
7–9	0.30	0.30	0.20	1.12	12.3
9–10	0.36	0.35	0.19	1.16	12.5
10–13	0.40	0.39	0.15	1.19	13.2
13–18	0.39	0.39	0.27	1.29	13.2
18–74	0.45	0.44	0.34	1.48	13.6
Average	0.31	0.30	0.21	1.15	12.1

Note: SSI (Supplemental Security Income). All-condition readmission measure is based on 3M potentially preventable readmissions. Penalty is calculated as a percentage of base operating payments and thus does not include outlier payments, indirect medical education payment, disproportionate share payments, and special rural hospital specific payments.

Source: MedPAC analysis of 2010 Medicare claims files and SSI files from CMS.

divides all hospitals into 10 peer groups based on the share of their patients on SSI. The 10 categories range from less than 3 percent SSI patients to more than 18 percent SSI patients. The third column shows that, under the current policy, the average penalty for hospitals with the most SSI patients is double the penalty for hospitals with the fewest SSI patients (0.45 percent and 0.21 percent, respectively). The fourth column is presented to remind readers that penalties under current law will increase in 2015 when the current policy expands from penalizing hospitals for excess readmissions for three conditions to implementing penalties for seven conditions. While we know penalties will increase in 2015 under current policy, the magnitude of the increase is unknown. The fifth column of Table 4-11 presents the penalties under our alternative all-condition measure. The average all-condition measure penalty (0.48 percent) is higher than the average penalty under the current three-condition measure (0.31 percent), but it may be lower than future penalties as the number of conditions covered by the current readmission measure increases to seven conditions in 2015. An all-condition measure could have a lower penalty than a seven-condition measure in part due to removal of the multiplier that exists in the current formula.

An important point in Table 4-11 is that the magnitude of the penalty is similar across income categories under the peer group alternative. Hospitals serving a greater share of poor patients no longer have average penalties that are double the penalties of those serving the fewest poor. All penalties range from 0.46 percent to 0.54 percent.

Table 4-11 shows the baseline case where there is no improvement in readmission rates. However, the literature has shown that hospitals do have the potential to reduce readmission rates (Jack et al. 2009, McCarthy 2012, Rennke et al. 2013, Robert Wood Johnson Foundation 2013a, Robert Wood Johnson Foundation 2013b). Therefore, we also conducted a simulation of the penalties, assuming a 10 percent reduction in readmission rates (Table 4-12).

Table 4-12 shows that the all-condition penalty with a fixed target can accomplish two goals. First, penalties decline when readmissions decline; second, average

penalties of hospitals serving poor patients are brought closer to the average penalty. For example, the average penalty for hospitals with the largest share of SSI patients would decline from 0.44 percent of payments to 0.34 percent of payments. In addition, the fifth column shows that if readmission rates went down 10 percent, there would be much greater savings from readmission reductions than from penalties. This reduction would result in fewer resources that the health care system needed to spend on unnecessary care. It also would represent an important improvement for patients by avoiding unnecessary admissions. The last column in Table 4-12 shows what the peer group targets would be for hospitals in different income categories.[12]

The system of using SSI categories to compute penalties eliminates most of the variation due to patient income. However, the decile with the highest share of poor patients still has somewhat higher average penalties (0.34 percent of operating payments) than the average penalty (0.21 percent of operating payments). This result suggests that within this decile, there is still a fairly wide distribution of readmission rates, including some hospitals with unusually high readmission rates. One solution to address these outliers could be to direct funds from AHRQ's patient safety organizations or the care transitions initiative (which is funded by CMS as part of the Partnership for Patients initiative) to help hospitals serving the largest share of poor patients (Medicare Payment Advisory Commission 2010, Naylor et al. 2012). Another option is to take funds from the Quality Improvement Organizations (QIOs) and redirect them to provide grants to hospitals that could be used for consultants and for convening providers in the community to work together to reduce readmissions (Medicare Payment Advisory Commission 2011, Medicare Payment Advisory Commission 2010, Naylor et al. 2012). These hospitals would have to report their readmission rates just as all other hospitals do, but they would be given some tools to improve their rates. First, their penalties would be somewhat reduced due to having a higher benchmark readmission rate (13.6 percent vs. an average of 12.1 percent). Second, they could compare themselves with a group of peer hospitals that serve a similar share of low-income patients. They would also be given temporary resources to help improve their performance to the level of their hospital peer group. Finally, the QIO funds could be used for safety net hospitals serving poor patients to learn best practices from other safety net hospitals in their peer group that have kept their readmission rates near the national average (Jack et al. 2009, McCarthy 2012).

The existing HRRP policy does not recognize differences among hospitals' proportion of poor Medicare patients when calculating the readmissions penalty. The improvements outlined above would make such an adjustment to the penalty using the hospitals' percentages of low-income Medicare patients. The Commission's research has shown that after adjusting for clinical risk, income is still an important SES variable in explaining variation in readmissions. Moreover, it is important to recall that in June 2011 the Commission recommended retargeting the QIO resources to providers that are poor performers—in this instance, hospitals with high proportions of low-income Medicare beneficiaries and high readmission rates might be good candidates for temporary help to improve their readmission rates. In these two ways, mitigating (but not eliminating) the impact of the penalty for hospitals serving many of the poor through the penalty formula and targeting resources for the worst performers, the Commission would expect to improve readmission rates for these populations.

However, because the complicated landscape of patient contextual and social factors affecting the risk of readmission is not well understood, gaining a better understanding of the association between patient-level characteristics and hospital readmissions is important so that hospitals can direct intervention resources toward the patients at highest risk. Discussions of risk adjustment for socioeconomic factors in the area of hospital readmissions have raised concerns that including these factors will mask disparities and lead to different standards of care for different patient populations. An area of research that should be pursued involves gaining a better understanding of how socioeconomic factors that affect patients' risk of problems with postdischarge care could instead help to identify areas for interventions to reduce existing disparities. Such research would give hospitals more tangible methods of managing patients in these circumstances. Part of that research should focus on health systems that have developed strategies that have lowered their population's readmission rates.

Conclusions and implications for future research

The current readmission penalty is one step forward in a series of steps to improve care coordination and outcomes of care for Medicare patients. However, our analysis of the current policy exposes shortcomings in the readmission

rate and penalty formulas that can work at cross purposes to the policy's intent. Our proposed combination of refinements—an all-condition readmission measure, a preset readmission target for hospitals, and an adjustment of hospitals' targets based on their share of SSI patients—is intended to address the current policy's shortcomings. We also favor a longer term research agenda that includes investigating the relationship between readmissions and mortality and whether to expand the policy to include critical access hospitals, observation stays, and post-acute care providers. Over time researchers could also investigate improving risk adjusters by adding better measures of patient literacy, patient frailty, and other factors. We can also move to continue to ensure incentive alignment with future policies that may be adopted, such as bundling services or redesigning the Medicare benefit and beneficiary cost sharing. ■

Endnotes

1 The incentives to coordinate care should affect more than just the hospital. For example, the Commission has recommended that skilled nursing facilities face a readmission penalty. The Commission has also discussed testing broader incentives through accountable care organizations or bundling.

2 We are starting to explore a "healthy days at home" measure that would take some set period—for example, 30 days after discharge—and count how many days the beneficiary was at home and alive as opposed to being in a hospital or skilled nursing facility. A combined measure of mortality and readmissions could be a first step in this direction and could be investigated as a future refinement of the current readmission policy.

3 It is important to note that not all potentially preventable admissions can be avoided (3M Health Information Systems 2008). The 3M method classifies a potentially preventable readmission as a readmission that is clinically related to the initial hospitalization in that the underlying reason for the readmission may be plausibly related to the care during and immediately after a prior hospital stay. A clinically related readmission may have resulted from a process of care or treatment during the prior admission or from a lack of postdischarge follow-up rather than from unrelated events that occurred after the prior admission.

4 The rate for each hospital is computed as the number of readmissions at any hospital divided by the number of discharges for that hospital. Thus, the denominator does not include patients who die in the hospital and counts a maximum of one readmission per initial index admission. Both measures also exclude from the denominator patients who were transferred to another acute care hospital.

5 Excess cost is based on base operating payments for the initial admission, not payments for the readmission. For most medical diagnoses, the payments for the initial admission and for readmissions are generally similar, but for surgical diagnoses, the payment for the initial admission often can be substantially greater than the payment for the readmission.

6 It would be possible for larger hospitals to use one year of data. But there is always a trade-off in which using only the most recent year of data results in a smaller sample of data and more random variation. It would also be possible to weight more recent data more than older data.

7 If a hierarchical random effects model were used, values would continue to shrink toward the national mean. However, the degree to which values would shrink toward the mean would diminish because of significant increases in the number of observations.

8 The group of hospitals could be hospitals in a system or hospitals located in the same community that jointly reduce readmissions.

9 We used a 10 percent reduction for illustration. Greater improvements would result in even lower penalties.

10 The all-condition readmission method developed by the Yale team continues to use a random effects hierarchical model that results in shrinking values toward the mean. However, the degree to which values shrink toward the mean is reduced because of aggregating admissions into five categories, resulting in larger pools of admissions. Larger numbers of admissions in each pool in turn reduce the degree to which values shrink toward the mean.

11 Almost all the correlations among CMS measures are slightly negative. This result could in part be an artifact of the way CMS computes the measures. For mortality under the CMS system, the death of a transferred patient is counted against the hospital that initially served the patient. Readmissions are the opposite; when a patient is transferred to a second acute care hospital and later readmitted, that admission and readmission are counted only when computing the second hospital's admission and readmission rates (under both the CMS and the 3M methods). So it is possible that hospitals that transfer out difficult patients will look worse on mortality and better on readmissions if the risk adjuster does not fully capture the extra difficulty with transfer cases. The reverse holds for large teaching hospitals that receive difficult transfers. This phenomenon could explain some of the small negative correlations but is unlikely to be large enough to explain the large heart failure inverse relationship.

12 The categories are now discrete with up to a 0.4 percent difference in the target readmission rate between adjacent categories. This difference could be addressed by smoothing rates within each decile similar to using a spline function. The adjuster would then be continuous without any jumps at the 10 cut points, but each hospital could still clearly be given a set of peers with similar SSI levels against which to benchmark themselves.

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