

CHAPTER

# 5

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## **Payment for post-acute care**

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## Payment for post-acute care

**P**roviders should base their decisions about where beneficiaries receive post-acute care services on patient characteristics and resource needs, not on Medicare payments. Given the potential overlap in services and lack of criteria delineating the appropriate treatment setting, post-acute care decisions are sensitive to payment system incentives. Where overlap exists, the tradeoffs between cost and quality often are unknown. In this chapter, we report on the results of one study comparing patient characteristics, outcomes, and spending in different post-acute settings for beneficiaries who had a hip or knee replaced. Next, to examine how well policymakers and researchers could compare patients across settings, we report on the various patient assessment tools currently required in three post-acute settings. Finally, we discuss the reasons that the payment systems for skilled nursing facilities and home health services may not be paying appropriately for all types of patients. We discuss ways to correct problems with payments in these settings to ensure that payments better track the resource needs of different patients.

### In this chapter

- Comparing outcomes and spending for beneficiaries who have had a hip or knee replaced
- Comparing the patient assessment tools used in post-acute care settings
- Assessing the skilled nursing facility PPS
- Assessing the home health PPS

Post-acute care generally follows an acute hospitalization and is provided in four settings—skilled nursing facilities (SNFs), inpatient rehabilitation facilities (IRFs), long-term care hospitals (LTCHs), and the home. Post-acute care includes services such as physical or speech therapy, wound care, skilled nursing care for chronic conditions, and care for patients who use ventilators. Eligible beneficiaries who are referred from the community and who use home health services without a prior hospitalization also use post-acute care.

In 2002, one-third of Medicare beneficiaries discharged from acute hospitals used post-acute care within one day of leaving the hospital (Figure 5-1). SNFs are the most frequently used setting, with home health the next most frequently used.

Services provided in the four post-acute settings are often similar, but coverage rules, service intensity, and payments differ for the four post-acute settings. Medicare’s eligibility criteria for beneficiaries using post-acute care vary by setting. The program’s conditions of participation (COPs) for providers, staffing ratios, and even types of staff differ by setting. Medicare pays for care in each setting using a distinct payment system. The differences among the settings in COPs, staffing ratios, and intensity of care have contributed to the historical costs on which the payment system in each setting is based. Pronounced geographic differences in the supply of post-acute services also exist.

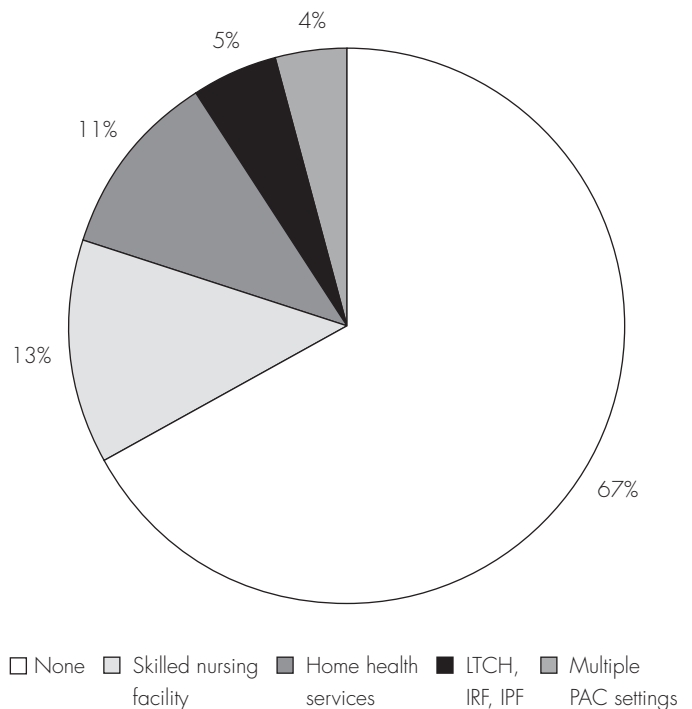
Some observers maintain that beneficiaries can use post-acute care as a continuum of care, where patients use multiple types of post-acute care consecutively as their need for care decreases. Evidence indicates that although it may be a continuum for some, relatively few beneficiaries use more than one post-acute setting: In 2002, 4 percent of the beneficiaries discharged from the hospital used more than one post-acute setting. Most beneficiaries who used more than one setting used home health services after a SNF stay (97 percent).

Several studies have explored whether care in one setting can be appropriately substituted for care in another by looking at whether similar patients have experienced similar outcomes in different settings. In one study, researchers found that the potential for substitution varied by diagnosis, with little potential for substitution among stroke patients but more potential for congestive heart failure patients (Gage 1999). Other studies provided

mixed evidence of substitution, which sometimes varied by diagnosis (Deutsch et al. 2005, Kane et al. 2000, Keith et al. 1995, Kramer et al. 2000, Kramer et al. 1997, Manton et al. 1994). For example, Kramer (1997) found that SNFs and IRFs had equivalent functional outcomes for hip fracture patients, but Kane (2000) found that hip fracture patients experienced better outcomes in IRFs and at home compared with SNFs. In the only study that used data collected after the SNF and IRF prospective payment systems (PPSs) began, researchers found that hip fracture patients who used IRFs experienced better functional outcomes than patients who used SNFs (Munin et al. 2005).

**FIGURE 5-1**

**One-third of beneficiaries discharged from hospitals use post-acute care**



Note: LTCH (long-term care hospital), IRF (inpatient rehabilitation facility), IPF (inpatient psychiatric facility), PAC (post-acute care). "None" indicates patients who used no post-acute care following their hospital stay. This chart shows the share of patients who used post-acute care within one day of discharge from the hospital.

Source: Hogan 2004.

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## Comparing outcomes and spending for beneficiaries who have had a hip or knee replaced

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One criterion that distinguishes IRFs from acute hospitals is the so-called 75 percent rule. This rule requires that an IRF admit 75 percent of patients for one or more conditions from a list of conditions that CMS specifies, such as stroke or hip fracture. In 2004, after several years of not enforcing the rule, CMS revised the list of conditions for the first time since 1983. Specifically, CMS eliminated “polyarthritis”—the most frequent diagnosis for beneficiaries who used IRFs in 2002—from the list and replaced it with four arthritis-related conditions. These conditions include (a) patients with polyarthritis who have bilateral joints replaced, are aged 85+, or have a body mass index (BMI) of 50+; (b) patients who have two major weight-bearing joints with severe osteoarthritis (not counting replaced joints); (c) rheumatoid arthritis; and (d) systemic vasculidities with joint inflammation. The last three conditions must not have improved after an appropriate, aggressive, and sustained course of outpatient therapy services (or services in less intensive rehabilitation settings) immediately preceding the IRF admission or must result from a systemic disease activation immediately before admission. CMS is phasing in the changes in the 75 percent rule, beginning in July 2005, over a period of four years—50 percent the first year, 60 percent the second year, 65 percent the third year, and 75 percent in successive years. CMS maintains that polyarthritis—the diagnosis for hip and knee replacement patients—does not require the intense rehabilitation provided by IRFs, except in select cases.

In effect, the change in the 75 percent rule means that fewer beneficiaries with a single hip or knee replacement will likely use IRF care. IRFs that previously have admitted a substantial proportion of joint replacement patients are expected to change their behavior in order to comply with the new rule as it phases in. As a result, under the new 75 percent rule, some beneficiaries with a hip or knee replacement who need rehabilitation but do not meet the new criteria will not go to an IRF but instead will have a longer acute hospital stay, be referred to SNFs, or be sent home with home health or outpatient therapy. Other such beneficiaries may continue to use IRFs; the rule provides for 25 percent of IRF patients to have conditions not on the list. The research we discuss in this section is the first

study comparing outcomes and spending for joint replacement patients across settings.

To determine the potential effect of the change in the 75 percent rule, we convened a physician panel of orthopedic surgeons and specialists in physical medicine and rehabilitation in which they could discuss their views of differences among patients that influence the setting beneficiaries use. We also contracted with RAND to compare outcomes and Medicare spending across settings for beneficiaries who have had a hip or knee replaced. This information can help policymakers better understand the impact of the new 75 percent rule on beneficiaries and Medicare’s costs.

### Physician panel

We convened a panel of six orthopedic surgeons who perform many hip and knee replacements and five specialists in physical medicine and rehabilitation who are familiar with the rehabilitation of these types of patients. Generally our panelists were affiliated with large academically oriented health care institutions located in various parts of the nation. We asked this panel to discuss where beneficiaries who have had a hip or knee replaced should be rehabilitated after surgery. We also asked the panel to discuss whether they had observed any change in practice or referral patterns since the publication of the new 75 percent rule.

The orthopedic surgeons told us that patients who have had a hip or knee replaced ideally should go home with either home health care or outpatient therapy services—between 50 percent and 85 percent of their Medicare patients go home from the hospital in two to four days following surgery. (These estimates are higher than the national rate [Table 5-1, p. 109].) The panel said that characteristics of patients who require rehabilitation in an institutional setting (IRF or SNF) are those who:

- are limited in weight-bearing ability or cannot walk 100 feet,
- are obese,
- have impairment of one or more joints (other than the one replaced),
- have diminished presurgery functioning,
- have comorbidities, such as congestive heart failure or post-operative dementia,

- have architectural barriers at home, or
- have no informal caregiver.

Weight-bearing ability is an important predictor of how fast patients recover after surgery, and it may even determine whether the patient makes progress. Obesity also affects a patient's ability to bear weight. The panel unanimously questioned the appropriateness of a BMI of 50 as a criterion for joint replacement patients who are obese to be counted in the 75 percent rule. The panelists thought that beneficiaries with a BMI of 50 or more would not be able to tolerate the intense rehabilitation provided in IRFs. Thus, in the panelists' opinion, the standard excluded all obese persons who might benefit from IRF care. Some panelists thought a BMI of 38 was a more appropriate standard.

Regarding the question of whether patients with the need for rehabilitation in an institutional setting should go to an IRF or a SNF, the orthopedic surgeons felt that joint replacement patients could go to SNFs, although SNFs would not rehabilitate patients as quickly as IRFs. The panelists also agreed that certain circumstances cause IRFs to be more appropriate. For example, when a patient has comorbidities, he may benefit from the extra medical attention that an IRF provides. However, if a patient cannot stand the intense therapy provided at an IRF, or if he has a weight-bearing constraint, the convalescent care of a SNF may be more appropriate.

Orthopedic surgeons in some communities decide on an IRF versus a SNF based on the characteristics of the specific facilities available. The surgeons suggested that their comfort level with facilities may reflect the level and type of staffing at the facility, whether the facility follows protocols, or even the surgeon's convenience. For example, because physicians in SNFs are usually not involved in frequent supervision of patients while physicians in IRFs are integrally involved with patients, orthopedic surgeons may prefer IRFs because they can hand off patients to an IRF's physicians with confidence that those patients would continue to receive close monitoring. One surgeon said that his practice area had neither SNFs nor IRFs. In general, surgeons said that they did not know the outcomes of patients being rehabilitated in SNFs.

The panelists maintain that the publication of the new rule defining IRFs has already affected referral patterns. They reported that some IRFs will no longer accept joint

replacement patients and that acute hospital lengths of stay (LOSs) have increased slightly as a result. Panelists told us that IRFs with a large referral base would have fewer problems meeting the new criteria, but IRFs with a smaller referral base may have greater difficulty complying. Some orthopedic surgeons also reported having developed protocols for home health agencies, so that these agencies could provide more intensive rehabilitation services to patients after hip or knee replacement.

## Results from the empirical study

We contracted with researchers to study outcomes and Medicare spending for all beneficiaries who had hip or knee replacements and who were discharged from an acute hospital between January 2002 and June 2003 (see text box on p. 113 for study methods) (Beeuwkes Buntin et al. 2005).<sup>1</sup>

The research questions in this study were:

- What are the differences among hip or knee replacement patients who use IRFs, SNFs, or go home following surgery?
- What are the differences in outcomes for these patients?
  - What are the differences in functional status?
  - What are the differences in patients residing in the community at 120 days?
- What are the differences in Medicare spending for these patients?

## Differences in patient characteristics

The study found:

- About 30 percent of patients who had hip or knee replacements used SNF care following surgery, 35 percent used IRF care, and the remaining 35 percent returned home (with home health care, outpatient therapy, or no care) (Table 5-1).
- On average, patients who go home following surgery are younger, have fewer comorbidities and complications, and are less likely to be eligible for both Medicare and Medicaid than IRF patients. Compared with IRF patients, SNF patients are significantly older, have more comorbidities and complications, and are more likely to be eligible for both Medicare and Medicaid (Table 5-1).

**TABLE  
5-1**

**Selected characteristics of patients with hip or knee replacement**

Characteristics	Site of care after surgery		
	Home	IRF	SNF
Number of observations	149,000	149,000	128,000
Percentage	35%	35%	30%
<b>Demographic characteristics</b>			
Age (years)	72.7	75.0	76.3**
Female	54.3%	70.2%	72.2%**
White	94.2	89.9	93.3**
Black	3.3	6.8**	4.1
Medicaid coverage	5.2	9.2	10.1**
<b>Complications</b>			
Postoperative pulmonary compromise	0.3	0.5	0.8**
Postoperative GI hemorrhage or ulceration	0.2	0.2	0.3**
Cellulitis or decubitus ulcer	0.3	0.5	0.8**
Septicemia	0.0	0.0	0.1**
Mechanical complications due to device or implant	0.9	1.2	1.7**
Shock or cardiorespiratory arrest	0.1	0.1	0.2**
Postoperative heart attack	0.3	0.4	0.6**
Venous thrombosis or pulmonary embolism	0.5	0.7**	0.6
Iatrogenic complications	3.4	4.0	4.7**
<b>Comorbidities</b>			
Acute renal failure	0.3	0.7	0.8**
Delirium	0.7	1.4	2.0**
Chronic pulmonary disease	9.1	11.2	11.8**
Congestive heart failure	3.4	5.8	7.1**
Chronic renal failure	0.1	0.2	0.2**
Nutritional deficiencies	0.1	0.2	0.4**
Dementia	0.5	0.9	2.3**
Pneumonia	0.6	0.8	1.2**
<b>Type of joint replacement</b>			
Hip replacement	31.2	36.1	40.0**
Total	25.8	30.1	31.0**
Partial	0.6	1.3	2.7**
Hip revision	4.8	4.8	6.3**
Knee replacement	68.5	63.9**	60.0
Total	62.5	60.0**	55.8
Bilateral procedure	1.8	6.2**	4.0

Note: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility), GI (gastrointestinal). Patients who were in a custodial nursing home before or after their acute stay, who used acute rehabilitation (DRG 462), used long-term care hospitals, or died in the first 30 days after their acute discharge are excluded from this analysis. This excludes < 3% of the sample. Patients in the sample were hospitalized from January 2002 through June 2003.

\*\* Indicates significant t-test for differences between IRF and SNF values at the 0.0001 level.

Asterisks are placed next to the higher of the values for SNF and IRF.

Source: Beeuwkes Buntin et al. 2005.

- Of beneficiaries who use institutional settings, those who have had hip replacements are more likely to go to a SNF, while beneficiaries who have had knee replacements are more likely to go to an IRF (Table 5-1, p. 109).

**TABLE 5-2**

**Characteristics of discharging hospitals and proximity to facilities for patients with hip or knee replacement**

	Site of care after surgery		
	Home	IRF	SNF
Number of observations	149,000	149,000	128,000
Percentage	35%	35%	30%
<b>Discharging hospital's characteristics</b>			
Nonprofit hospital	78%	76%	79% **
Government hospital	10	9	10 **
Percentage of:			
Low-income patients	12	13 **	12
Medicare days	47	47	49 **
Hospital's ADC	204	235 **	191
Resident-to-ADC ratio	0.118	0.144 **	0.110
Case-mix index	1.532	1.548 **	1.469
<b>Patient's proximity to facility</b>			
Average number of			
IRFs within travel radius	11	13 **	11
SNFs within travel radius	39	43	46 **
No SNFs within travel radius	0.001	0.001 **	0.001
Distance to nearest			
SNF in miles	3	2	2 **
Distance to nearest IRF in miles	18	11	18 **

Note: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility), ADC (average daily census). Patients who were in a custodial nursing home before or after their acute stay, used acute rehab (DRG 462), used long-term care hospitals, or died in the first 30 days after their acute discharge are excluded from this analysis. This excludes < 3% of the sample. Patients in the sample were hospitalized from January 2002 through June 2003.  
 \*\* Indicates significant t-test for differences between IRF and SNF values at the 0.0001 level.  
 Asterisks are placed next to the higher of the values for SNF and IRF.  
 Travel radius is defined as the 90th percentile of the distance traveled to a type of provider by beneficiaries living in that type of area.

Source: Beeuwkes Buntin et al. 2005.

- On average, IRF patients come from acute hospitals that are larger, have a higher case-mix index, and are more likely to be teaching hospitals (Table 5-2).
- Distance to a facility may be a factor in determining site of care. On average, patients who use an IRF have one that is relatively close to their residence (Table 5-2).

**Differences in outcomes**

In this section, we discuss differences in functional status for SNF and IRF patients, mortality, and residence in the community. IRFs and SNFs measure functional status close to or at admission for their patients. Patients who go home with outpatient therapy or with no care do not have their functional status assessed.

The preferred outcome—improvement in functional status—is not assessed for most SNF patients. Because SNFs do not assess patients' functional status at discharge, researchers compared functional status at admission and discharge (or at 14 days) for patients who stayed in the IRF or the SNF at least 14 days.<sup>2</sup> Researchers created a measure of functional status similar to the Barthel Index (Mahoney and Barthel 1965) and mapped from the SNFs and IRFs assessment tools to the index. As discussed in the section on patient assessment instruments, clinicians use these tools to ask different questions and assess patients at different times during their post-acute stay, so the quasi-Barthel Index may not be comparable. As a result, researchers also examined patients' independence in walking and in transfer (for example, from a bed to a chair).

**Descriptive analysis** Based on descriptive statistics that do not control for differences in patient characteristics and potentially measure IRF and SNF patients at different points in their stay, SNF patients have a higher functional status score at admission than IRF patients. But SNF patients with a 14-day or longer stay have lower functional status scores than IRF patients discharged from the facility at 14+ days (Table 5-3).

**Walking**—Of patients who were discharged at 14+ days after admission, 1 percent of IRF patients were walking independently at admission but 76 percent were walking independently at discharge. For SNF patients in the facility at 14+ days after admission, 9 percent were walking independently at admission but 31 percent were walking independently at 14 days (Table 5-3).



**TABLE  
5-3**

**Functional status outcomes  
for patients with hip or  
knee replacement**

**Site of care after surgery**

	<b>IRF</b>	<b>SNF</b>
<b>Functional status for all patients</b>		
Mean score on Barthel Index at admission (0–90)	46	55 **
Percentage of patients:		
Walking independently at admission	10 %	20 %**
Transferring independently at admission	11	16 **
<b>Functional status for patients with 14+ day stay†</b>		
Mean score on Barthel Index (0–90):		
at admission	35	47 **
at discharge	65 **	58
Percentage of patients:		
Walking independently at admission	1 %	9%**
Walking independently at discharge/14+ days	76 **	31
Transferring independently at admission	2	8 **
Transferring independently at discharge/14+ days	79 **	30

Note: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility). Patients who were in a custodial nursing home before or after their acute stay, used acute rehabilitation (DRG 462), used long-term care hospitals, or died in the first 30 days after their acute discharge are excluded from this analysis. This excludes < 3% of the sample. Patients in the sample were hospitalized from January 2002 through June 2003. \*\* Indicates significant test for differences between IRF and SNF values at the 0.0001 level. Asterisks are placed next to the higher of the two values. Barthel Index (Mahoney and Barthel 1965) created by mapping functional status items from assessment instruments used in SNFs and IRFs. Higher scores on Barthel Index mean greater independence in functional status. † Indicates discharge from IRFs; 14+ days means SNF patients assessed at 14 days.

Source: Beeuwkes Buntin et al. 2005.

**Transferring**—Of patients who were discharged at 14+ days after admission, 2 percent of IRF patients were transferring independently at admission but 79 percent were transferring independently at discharge. For SNF patients in the facility at 14+ days after admission, 8 percent were transferring independently at admission but 30 percent were transferring independently at 14 days (Table 5-3).

**Multivariate analysis** As noted in the descriptive analyses, there is a great deal of selection of patients into the three settings (IRF, SNF, and home). Thus it is critically important to control for both observed and unobserved selection. The importance of controlling for selection effects is demonstrated by the results from an unadjusted regression model that shows that SNF patients are 2.7 percentage points more likely to be dead or institutionalized at 120 days after discharge from an acute hospital as compared with patients going home (Table 5-4, p. 112). The difference declines to 1.2 percentage points in the model adjusted for observable patient characteristics. The difference declines further to 0.46 percentage points in an instrumental variable (IV) model that is designed to capture unobserved selection effects.

Using IV models, researchers found that compared with patients who went home after surgery, patients who used IRFs and SNFs are more likely to be dead or institutionalized 120 days after discharge from an acute hospital by 0.18 and 0.46 percentage points, respectively (Table 5-4, p. 112). It is important to note that neither IRFs nor SNFs have a significant statistical effect when mortality by itself is the outcome; therefore, the effect appears to be operating through institutionalization alone.

The IV models provide the best estimates of the causal effect of post-acute care on outcomes, but the researchers were unable to rule out the possibility that some selection remains in these estimates. Outcomes depend on many factors, including patients’ physical and cognitive abilities, underlying medical conditions, sensory and emotional factors, willingness to participate in care, and supportive environments. No risk adjustment approach can control for every factor affecting outcomes of care (Iezzoni 2003). The choice of IVs was carefully considered to address this problem, but the estimates could be biased if the instruments are invalid. Another limitation of the study is that the outcomes analyzed are not the ideal outcomes for patients who have had hip or knee replacements. The preferred outcomes analysis would examine changes in patients’ functional status, but the data are not available for all patients.

**Differences in Medicare payments**

Instrumental variable analyses show that IRF patients cost Medicare more than patients who go home and more than patients who use SNFs. Patients who use IRFs cost about \$8,000 more in Part A spending than those who go home after surgery, and patients who use SNFs cost about

**TABLE  
5-4**

**Outcomes for patients with hip or knee replacement**

Outcome	Unadjusted model	Adjusted for patient characteristics			Instrumental variable model		
	Marginal effect	Marginal effect	Standard error	P-value	Marginal effect	Standard error	P-value
<b>Dead or institutionalized at 120 days after discharge</b>							
IRF vs. home after surgery	0.0058	0.0043	0.0004	0.00**	0.0018	0.0009	0.04*
SNF vs. home after surgery	0.0267	0.0120	0.0005	0.00**	0.0046	0.0008	0.00**
<b>Dead at 120 days after discharge</b>							
IRF vs. home after surgery	0.0030	0.0020	0.0003	0.00**	0.0016	0.0012	0.18
SNF vs. home after surgery	0.0089	0.0038	0.0003	0.00**	0.0023	0.0012	0.06
<b>Part A PAC payments</b>							
IRF vs. home after surgery	\$9,959	\$9,050	\$31	0.00**	\$8,298	\$68	0.00**
SNF vs. home after surgery	6,028	4,685	33	0.00**	3,704	61	0.00**
<b>Part A payments (PAC payments + acute stay)</b>							
IRF vs. home after surgery	\$10,204	\$8,871	\$33	0.00**	\$8,023	\$70	0.00**
SNF vs. home after surgery	6,116	4,590	35	0.00**	3,578	63	0.00**

Notes: IRF (inpatient rehabilitation facility), SNF (skilled nursing facility), PAC (post-acute care). Marginal effect is the change in predicted probability associated with changes in the explanatory variables. Post-acute payments are accumulated for 120 days after discharge from the acute hospital. Patients in the sample were hospitalized from January 2002 through June 2003.

\* Indicates significance at the 0.05 level. \*\* Indicates significance at the 0.0001 level.

Source: Beeuwkes Buntin et al. 2005.

\$3,600 more in Part A spending than those who go home after surgery (Table 5-4).<sup>3</sup> Payment rates differ widely for patients who are rehabilitated in IRFs versus SNFs. Medicare pays IRFs on a per-case basis but pays SNFs on a per-diem basis. Because of these different payment units, it is not straightforward to compare, but in general, Medicare pays IRFs more. The costs reported here are incomplete because we do not include payments to physicians or payments for outpatient therapy in the spending comparisons. These results also highlight the importance of controlling for selection effects, although controlling for selection had a small effect in the payment models compared with the outcome models.

**Discussion**

We undertook this study to determine the impact the new 75 percent rule might have on beneficiaries and the

Medicare program. The evidence is not definitive. Some descriptive and multivariate results suggest that marginal patients may be institutionalized more frequently when they use SNFs rather than IRFs, and more frequently in both of these settings compared with those going home. But the fact that patients going home after surgery do better than those in either SNFs or IRFs suggests that patient selection is strongly present in these data and we cannot fully discount its effects. (See text box for a description of study methods.)

In general, the results from the models show that in terms of Part A costs, episodes in an IRF or SNF are much more costly for Medicare than for episodes of care among patients going home. The results also show that payments for episodes of care involving IRF care are much higher than episodes of care involving SNF care, even after controlling for characteristics of patients and discharging acute hospitals.

## Study methods for multivariate analyses

In this study sample, RAND included all elderly Medicare beneficiaries who underwent a hip or knee replacement with no preceding hip fracture and who were discharged from an acute hospital between January 2002 and June 2003 (Beeuwkes Buntin et al. 2005). Researchers defined “post-acute location” as the first Medicare-covered site in which the patient received care within 30 days of discharge from an acute hospital. Excluded from the sample were the following types of patients, who made up less than 3 percent of the total:

- patients who died in the hospital or within 30 days of discharge (<1 percent);
- patients who received custodial care in nursing homes before or after their admission to the acute hospital;
- patients discharged to long-term care hospitals from acute hospitals;
- beneficiaries who enrolled in HMOs within four months of discharge; and
- patients who had incomplete personal information or missing discharge hospital characteristics.

### Independent variables

Researchers at RAND included a wide array of independent variables that they expected would affect beneficiaries’ choice of post-acute care. Examples of individual predictors are age, gender, race, Medicaid enrollment, and place of residence. To capture the complexity of patients at the time of hospital discharge, researchers included a large set of comorbidities and complications tailored to joint replacement patients. To capture factors that may influence post-acute use, researchers used variables from the acute hospital, such as average daily census, teaching status, ownership, Medicare share, case-mix index, and low-income patient percentage. Researchers defined availability of post-acute care based on how close inpatient rehabilitation facilities (IRFs) and skilled nursing

facilities (SNFs) were to patients’ homes and how many of each type of facility were located within reasonable distances of patients’ homes.

### Outcomes

Researchers examined descriptive statistics on health outcomes: residency in a nursing home at 60 days and 120 days; and death within 60 days and 120 days of their acute hospital discharge. Researchers combined the institutionalization and mortality variables into composite measures to avoid the bias associated with using variables for survivors only.

### Payments

Researchers adjusted payments for area wage differences. They created summary variables for total post-acute care payments and total episode payments. The total episode payments combined payments for the acute hospital stay and total post-acute payments.

### Multivariate analyses

Researchers used multivariate analyses to estimate how the site of care affected outcome measures. Multivariate analysis controls for observable differences in the patient population at each site of care—differences that might confound estimates of the site’s effect on outcomes. In all models, researchers control for the individual predictors, clinical predictors, and characteristics of discharging hospitals.

### Instrumental variables analyses

Researchers frequently use instrumental variable (IV) methods to remove the estimates of confounding due to unobservable characteristics. RAND used measures of post-acute care availability as instruments. Because these factors are not correlated with beneficiaries’ clinical needs, researchers use them to predict use of IRFs and SNFs, and thus to infer the effect on outcomes for a marginal patient. Researchers typically use IV methods to control for the effects of selection bias, but these methods do not always capture all these effects. Beeuwkes Buntin and colleagues (2005) provide more information on methods. ■

As discussed above, functional status is the ideal measure of outcomes for patients who have had a hip or knee replaced. To determine the effect—on beneficiaries and on the program—of using different sites of care for rehabilitation after hip or knee replacement, we would need to compare functional status, walking, and transfer across settings. One major problem in comparing these measures is that SNFs do not assess patients' functional status at admission and discharge. For this and other reasons, we recommended in our March 2005 *Report to the Congress* that CMS collect information on functional status at admission and discharge.

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## Comparing the patient assessment tools used in post-acute care settings

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Policymakers need uniform data to monitor and evaluate the quality of care and patient outcomes across post-acute settings. Comparing post-acute patients across settings will likely require CMS to construct a new assessment tool that includes valid and reliable measures that use consistent definitions, timeframes, and scales across the post-acute settings.

Common information across the post-acute sites is currently not available. Medicare requires three of the four settings—home health agencies (HHAs), SNFs, and IRFs—to use tools to assess patients, but each setting uses a different tool. LTCHs are not required to use a tool to assess patients. Because the information gathered by clinicians differs across settings, it is not possible for CMS to (a) compare the care needs or outcomes of patients who are treated by different types of providers or (b) consider this information when designing an integrated post-acute care payment system.

In this section, we compare the information gathered by clinicians using each patient assessment tool. For dimensions that are similar, we assess the aspects and definitions of the care that the tools evaluate, the time periods that the tools cover, and the measurement scales that the tools use. We found that although the tools have four aspects of care in common, the definitions of care included in the measures, the timeframes covered, and the scales used to differentiate patients vary considerably. The differences among the tools limit how easily and meaningfully we can consolidate these data and whether we can evaluate patient outcomes across settings.

## Conducting the patient assessments

Medicare requires that clinicians in three post-acute settings evaluate patients using specific assessment tools (Table 5-5):

- The Minimum Data Set (MDS) must be used in SNFs.
- The Outcome and Assessment Information Set (OASIS) must be used in HHAs.
- The IRF–Patient Assessment Instrument (IRF–PAI) must be used in IRFs.

Medicare does not require LTCHs to use a patient assessment tool. However, many LTCHs assess their patients' care needs using the Acute Physiology and Chronic Health Evaluation (APACHE) and the Functional Independence Measure (FIM™). Last year, the Commission discussed the need for all LTCHs to use the same patient assessment tool as part of a review process for all admissions (MedPAC 2004).

CMS developed the three instruments independently and for different purposes. The IRF–PAI, the shortest instrument, was designed to evaluate and monitor outcomes of rehabilitation. The OASIS was originally a quality measurement instrument. Because clinicians furnish home health care in a noninstitutional setting, the OASIS also assesses a patient's ability to function at home. CMS developed the MDS to ensure that each beneficiary regularly received a comprehensive assessment and care plan designed specifically for him or her. Originally designed as a care-planning tool for long-stay patients, many of MDS's elements are not useful for classifying and assessing short-stay SNF patients (MedPAC 2003).

Partly reflecting these different purposes, the tools vary considerably in how frequently clinicians administer them and the time period that the assessment covers; the type of clinician who conducts the assessment, the method they use, and how long the assessment takes; and the scales that the tools use to differentiate patients.

### Assessment timeframes vary

The tools differ in terms of when a clinician conducts the assessment during a patient's course of treatment. SNFs conduct patient assessments within five days of admission and at specific intervals thereafter, but not necessarily on the day of admission or discharge. In contrast, clinicians

in HHAs and IRFs conduct the assessments primarily at admission and discharge. SNFs' lack of assessments at admission and discharge poses particular problems for evaluating these patients' outcomes. Most SNF patients do not stay long enough (14 days minimum) to be assessed a second time, making it impossible to measure patient outcomes. In March, MedPAC recommended that CMS collect information about activities of daily living (such as the ability to walk)—one of the common measures used to assess patients—at admission and discharge in SNFs (MedPAC 2005).

The period of time reflected in the measures varies considerably across the instruments. The time period covered by many of the functional status measures in the MDS is the previous seven days, compared with a single point in time captured in the IRF-PAI and the OASIS. As a result, even identical aspects of a patient could reflect differing patient characteristics or abilities at a given point

in time. For example, an assessment of a wound infection in a beneficiary at a SNF could mean that the patient had a wound infection within the past seven days, whereas in an IRF, this assessment would mean that the infection was present at time of admission.

### Assessment methods vary

The tools also differ in terms of the types of caregivers who may conduct the patient assessments and how the assessor gathers the information. As a result, clinicians may assess similar patients differently. In the MDS, clinicians may gather information from direct observation, interviews with multiple caregivers (including nurses, aides, and therapists), and review of patient care documentation. Direct patient observation is the preferred method of gathering information for the OASIS and IRF-PAI, but both instruments allow a combination of direct observation and reported performance (including

**TABLE 5-5**

**Frequency, time period covered, and measurement scales differ across post-acute patient assessment tools required by Medicare**

Dimension	Skilled nursing facilities	Home health agencies	Inpatient rehabilitation facilities	Long-term care hospitals
Tool	MDS	OASIS	IRF-PAI	None
Frequency of assessments	Initial (day 1–8); day 14; day 30; and every 30 days, up to day 100.	Initial at admission; every 60 days thereafter; and at discharge.	At admission and discharge.	
Time period covered	Generally 7-day look-back.	Status of patient on day of assessment.	Status on day 3 (for admission) and at discharge.	
Method of assessment	Information gathered from multiple caregivers' descriptions and documentation. Direct observation not required.	Direct observation preferred, but also often used interviews with patient, in-home caregiver.	Direct observation preferred but can be combined with reported performance.	
Minutes to complete	90 minutes <sup>a</sup>	90 minutes <sup>b</sup>	25 minutes <sup>c</sup>	

Note: MDS (Minimum Data Set), OASIS (Outcome and Assessment Information Set), IRF-PAI (Inpatient Rehabilitation Facility–Patient Assessment Instrument).

<sup>a</sup> CMS 2002.

<sup>b</sup> St. Pierre 2005.

<sup>c</sup> Buchanan et al. 2003.

Source: MedPAC analysis of patient assessment tools.

patient interviews). The IRF–PAI requires that facilities train their assessors to use the instrument; this training may increase the reliability of different assessors’ ratings.

The tools also require very different amounts of staff time to complete. The IRF–PAI is the shortest form (taking an estimated 25 minutes), while the OASIS and the MDS take an estimated 90 minutes.<sup>4</sup> A shortened version of the MDS can be submitted to update a beneficiary’s condition, but a full MDS must be completed within 14 days of admission.

### Assessment scales differ

The measurement scales used by the different tools vary in several ways, making it difficult to compare the information gathered with the tools. First, the number of points on the scales varies, thus resulting in differing distinctions between patients. For example, the MDS uses a four-point scale to evaluate many aspects of functional status, whereas the IRF–PAI uses a seven-point scale. Even for a task such as bathing, which is relatively similar in definition across settings, each tool codes the degree of assistance that patients require differently. For example, the MDS defines “independent” patients as those who use assistive devices without help while walking or eating. In contrast, the OASIS instrument distinguishes between “complete” and “modified” independence. If categories were collapsed, some of the detail currently collected would be lost.

Second, the scales can measure different aspects of a task, such as independence in performing an activity. For example, in the task of dressing, the gradations in the IRF–PAI scale refer to the share of the individual tasks

that the patient performs, whereas the MDS scale measures the number of times a patient needs assistance and whether assistance involves any weight bearing.

Third, the scorings across settings do not always distinguish between verbal cues (such as encouragements or reminders) and physical assistance (such as guided maneuvers or weight-bearing support needed to accomplish a task). The MDS and the IRF–PAI generally differentiate the types of help needed, but the OASIS typically does not.

Only one of the tools—the MDS—separately records (a) the typical amount of help that patients need and (b) the most help that patients need in their most dependent state. In contrast, the IRF–PAI and OASIS instruments capture a patient’s status at one point in time, which neither MDS measure captures.

### Common dimensions of care assessed differ across tools

The tools that Medicare requires have four common dimensions that clinicians assess for every patient: (1) diagnoses, (2) comorbidities, (3) functional status, and (4) cognitive status. But within each dimension, the aspects of care that clinicians evaluate vary considerably across the three tools.

### Diagnoses and comorbidities

Of the four dimensions, researchers generally find diagnoses and comorbidities the simplest to compare across settings. Yet little consistency exists in the recording of diagnostic information. MDS currently does not gather International Classification of Diseases,

**TABLE  
5-6**

**Patient assessment tools do not consistently use diagnosis codes**

Dimension	MDS	OASIS	IRF–PAI
ICD–9–CM codes	Not used	3 digits	5 digits
Number of diagnoses reported	Unlimited items can be checked off a set list	Primary +5 secondary diagnoses	Impairment category +10 comorbidities

Note: ICD–9–CM (International Classification of Diseases, Ninth Revision, Clinical Modification), MDS (Minimum Data Set), OASIS (Outcome and Assessment Information Set), IRF–PAI (Inpatient Rehabilitation Facility–Patient Assessment Instrument). Impairment categories are broad clinical categories used by the prospective payment system for inpatient rehabilitation facilities. Examples include traumatic and nontraumatic spinal cord injuries, stroke, and traumatic and nontraumatic brain injuries.

Source: MedPAC analysis of patient assessment tools.

Ninth Revision, Clinical Modification (ICD–9–CM) codes and instead uses checkoff lists for diagnoses and health problems (Table 5-6). The OASIS requires that only three of the five digits of the ICD–9–CM codes be completed (where the first three digits refer to a broad condition and the last two digits add specificity), thus limiting patient comparisons. In administering the IRF–PAI, clinicians may collect up to 10 comorbid conditions using ICD–9–CM codes, but the basic patient classification system requires a special “look-up” table to match “impairment groups” to ICD–9–CM codes. Before patients treated in IRFs can be compared with patients treated in other settings, the impairment group for each IRF patient needs to be mapped to an ICD–9–CM code.

The lack of uniform ICD–9–CM coding also limits the comparison of the severity of patients treated in different settings. Severity measurement systems, such as the all patient refined diagnosis related group (APR–DRG), require five-digit ICD–9–CM coding to differentiate among patients. Because SNFs do not gather ICD–9–CM codes, the severity of their patients’ diseases cannot be assessed. Furthermore, although the OASIS does not gather complete ICD–9–CM code information, it asks clinicians to rate each diagnosis on a four-point severity scale. While these ratings can assess the severity of patients within HHAs, they do not help with comparisons across settings.

## Functional status

Despite many similarities in the aspects of functional status that are assessed by the tools, the definitions of the activities vary considerably. All three tools assess a patient’s ability to walk, transfer (e.g., the ability to move between bed and chair), eat, dress, use a toilet, and do personal grooming. Yet within each category of care, the definition of the care the clinician evaluates varies across the tools—this variation could translate into meaningful differences in the patient’s care needs (Table 5-7). For example, in assessing a patient’s ability to walk, the IRF–PAI rates the distances the patient walks, whereas the MDS evaluates the amount of assistance the patient needs to walk within his or her room, down the hall, or to a different part of the facility. In assessing toilet use, one tool considers only the patient’s ability to get to and from the toilet, while another considers other aspects of toilet use but specifically excludes this one. The OASIS is the only tool that assesses the beneficiary’s ability to perform instrumental activities of daily living (such as housekeeping and meal preparation), reflecting the noninstitutional setting of this care.

Researchers who compared the functional status dimensions of MDS, OASIS and the FIM™ (which formed the basis of the IRF–PAI) found that although each measure was well suited for measuring patient status within its setting, none was well equipped to monitor the quality and outcomes across post-acute settings (Jette et al. 2003).

**TABLE 5-7**

**Examples of the differences in functional status measures included in post-acute patient assessment tools required by Medicare**

Dimension	MDS	OASIS	IRF-PAI
Walking	Amount and type (e.g., weight bearing or encouragement) of assistance required.	Ability to walk or to use a wheelchair on a variety of surfaces.	Distance walked.
Toilet use	Various aspects of toileting including transfer on and off toilet. No mention of getting to/from toilet.	Ability to get to and from toilet.	Various aspects of toileting but excludes transfer on and off toilet. No mention of getting to and from toilet.

Note: MDS (Minimum Data Set), OASIS (Outcome and Assessment Information Set), IRF–PAI (Inpatient Rehabilitation Facility–Patient Assessment Instrument).

Source: MedPAC analysis of patient assessment tools.

## Cognitive status

The cognitive status of patients is the assessment item that varies most across the three tools. Not only does the range of measures vary considerably, but measures of the same dimension of cognitive ability are also quite different (Table 5-8). For example, the MDS evaluates 13 aspects of cognitive status, including 6 measures for delirium and 16 for depression. The OASIS records information about 5 indicators of depression, while the IRF-PAI does not directly ask about it. The tools do not consistently require clinicians to separately record behaviors (such as wandering, or physically or verbally disruptive behavior) that may influence the amount of staff assistance required. Three measures in the IRF-PAI—short-term memory, social interaction, and problem solving—are broad and

could span considerable differences in patients and their resource requirements.

In addition to differences in measurement, differences in the definitions of cognitive status across the tools also exist. Although each tool evaluates the patient’s ability to make decisions, examples of the types of decisions patients should be able to make to be considered “independent” vary widely across the tools. For example, the MDS assesses a patient as independent if she can make decisions to organize her daily routine (such as knowing when to go to lunch and picking out clothing). By comparison, the IRF-PAI distinguishes between complex and routine decisions. The IRF-PAI assesses a patient as independent if she can solve complex problems such as managing a checking account.

**TABLE  
5-8**

**Wide range in cognitive status measures evaluated by patient assessment tools**

MDS	OASIS	IRF-PAI
<p><b>Comatose</b></p> <ul style="list-style-type: none"> <li>Comatose (yes/no)</li> </ul>	<ul style="list-style-type: none"> <li>Comatose not reported</li> </ul>	<ul style="list-style-type: none"> <li>Comatose (yes/no)</li> </ul>
<p><b>Memory</b></p> <ul style="list-style-type: none"> <li>Memory: short- and long-term</li> <li>Memory recall ability</li> <li>Cognitive skills for daily decision making</li> <li>Indicators of delirium (6 elements)</li> </ul>	<ul style="list-style-type: none"> <li>Cognitive functioning (includes alertness, orientation, concentration, and immediate memory for simple commands)</li> <li>Frequency of confusion</li> </ul>	<ul style="list-style-type: none"> <li>Short-term memory</li> <li>Problem solving</li> <li>Delirium (yes/no)</li> </ul>
<p><b>Communication</b></p> <ul style="list-style-type: none"> <li>Making oneself understood</li> <li>Ability to understand others</li> </ul>	<ul style="list-style-type: none"> <li>Ability to express oneself</li> <li>Ability to hear and understand spoken language</li> </ul>	<ul style="list-style-type: none"> <li>Expression</li> <li>Comprehension</li> </ul>
<p><b>Depression</b></p> <ul style="list-style-type: none"> <li>Indicators of depression, anxiety, sad mood (16 elements)</li> <li>Mood persistence</li> <li>Behavioral symptoms (such as wandering, or verbally or physically abusive behavior)</li> </ul>	<ul style="list-style-type: none"> <li>Depressive feelings reported or observed (5 elements)</li> <li>Frequency of anxiety</li> <li>Behavior demonstrated (includes verbal disruption, physical aggression, socially inappropriate behavior) and frequency.</li> </ul>	<ul style="list-style-type: none"> <li>Social interaction</li> </ul>
<p><b>Other</b></p> <ul style="list-style-type: none"> <li>Sense of involvement</li> <li>Unsettled relationships</li> <li>Past roles</li> </ul>		

Note: MDS (Minimum Data Set), OASIS (Outcome and Assessment Information Set), IRF-PAI (Inpatient Rehabilitation Facility–Patient Assessment Instrument).

Source: MedPAC analysis of patient assessment tools.



## Extensive data collection required to classify patients in Medicare's post-acute PPSs

Medicare's four prospective payment systems (PPSs) for post-acute care use many data elements to classify patients into payment groups.

### Diagnoses and clinical characteristics

International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes; rehabilitation impairment codes; change in weight; urinary and bowel incontinence; impaired vision; frequency of pain; skin condition (surgical wounds/lesions, number and stage of pressure ulcers); age; sex

### Functional status

Activities of daily living—dressing, bathing, transferring, toileting, ambulation and locomotion, bed mobility, grooming, bladder and bowel control

### Cognitive status

Comatose, memory, decision making, comprehension, communication, social interaction, depression, verbal/physically abusive or disruptive behavior, hallucinatory/delusional/paranoid

### Services provided

Rehabilitation therapy, intravenous/infusion therapy, total parenteral nutrition, intravenous feeding, daily injections for diabetes, chemotherapy, dialysis, respirator/ventilator support, tracheostomy care, oxygen therapy, suctioning, transfusions, radiation therapy, amputation and prosthesis care, range of motion, physician visits

### Other

Preceding inpatient hospital, rehabilitation facility, or skilled nursing facility stay; total charges; discharge status ■

## Building a uniform patient assessment tool

MedPAC's analysis shows that the current assessment tools that Medicare requires do not collect information that is easily and meaningfully integrated. If CMS were to build on the existing patient assessment tools, the data would still not be consistent due to the large differences in timeframes, scales, and many of the definitions. Furthermore, the current post-acute PPSs together require considerable information to establish payments (see text box).

In designing a new patient assessment tool, data elements should be selected so that CMS can establish payments and evaluate patient outcomes across all four post-acute settings. CMS has started this process (see text box, p. 120). Data elements need to predict resource use; capture relevant clinical data; be reliable, valid, and well accepted; and minimize the burden to providers and CMS. In addition to evaluating elements of the patient assessment tools currently required by Medicare, the merits of other assessment tools (such as the Mini-Mental

State Examination, the APACHE, and the Nursing Severity Index) should be considered.

Ideally, hospital discharge planners would use a uniform patient assessment tool to assess patients (and whether they can go home safely) prior to discharge from the acute hospital, identify the most appropriate post-acute setting(s), and discuss the placement option(s) with the beneficiary. Until a uniform tool is routinely collected, the Commission will consider the idea of using site-specific admission criteria to place patients in the most appropriate post-acute settings. In 2004, MedPAC recommended that CMS develop patient and facility criteria to ensure that patients treated in LTCHs are medically complex and have a good chance of improvement (MedPAC 2004). In 2005, the Government Accountability Office (GAO) recommended that CMS develop more specific descriptions of the patients appropriate for IRFs (GAO 2005). Expanding on these ideas, establishing setting-specific criteria could delineate the service capabilities and staffing levels for the provider, and could identify the clinical characteristics (including functional status) and resource needs of the patients.

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## Assessing the skilled nursing facility PPS

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In this section, we review concerns with the resource utilization group, version III (RUG–III) system. We begin by explaining how the classification system functions as a case-mix system to adjust SNF payments for patients with higher- and lower-than-average resource use. We then discuss problems with the payment system that stem from how the case-mix system (1) does not adequately distribute payment for nontherapy ancillary (NTA) services and (2) categorizes patients based on the amount of services SNFs provide or expect to provide. Next, we discuss payment system concepts that may address each of these problems. We conclude with a description of possible directions for future work to improve the SNF payment system.

## How does the current PPS buy SNF services?

Medicare’s SNF benefit covers SNF care for beneficiaries who, following an inpatient hospital stay of three or more days in the month preceding the SNF admission, need skilled nursing care. The SNF payment system pays hospital-based and freestanding SNFs a case-mix adjusted daily rate for up to 100 days of care per beneficiary. However, almost 60 percent of SNF stays lasted just 20 or fewer days in 2001, and only about 9 percent of covered SNF stays were longer than 60 days (Figure 5-2). The mean covered LOS for all Medicare-covered SNF stays was about 24 days. In 2003, Medicare paid \$14 billion for about 57 million days of SNF care.

### CMS activities to develop a uniform assessment tool

The Medicare, Medicaid, and State Children’s Health Insurance Program Benefits Improvement & Protection Act of 2000 (BIPA) instructed the Secretary to report by January 2005 on the development of an instrument to assess the health and functional status of beneficiaries who use post-acute services. BIPA required developers to create an instrument that would collect data that are readily comparable and to gather only the information necessary to meet program objectives. To date, CMS has not developed the instrument.

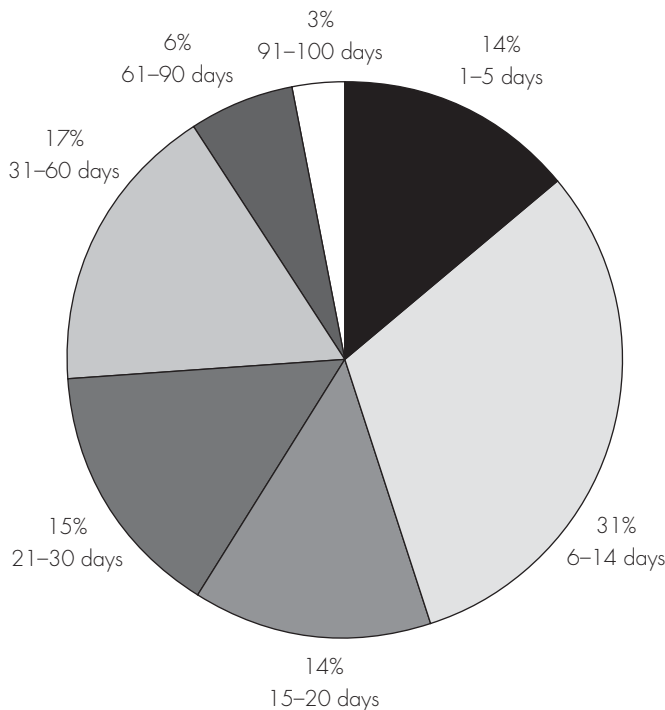
Although CMS has not focused on the development of an assessment tool, it has pursued the more fundamental task of examining the consistency of the definitions and terms used to evaluate the quality of post-acute care. With an eye toward adopting standard terminology to encourage the use of clinical information technology, CMS and the Office of the Assistant Secretary for Planning and Evaluation (ASPE) of the Department of Health and Human Services have collaborated to examine the consistency of vocabulary terms and definitions that describe key aspects of patient condition, such as “functional status.” In a recent study, ASPE found that one medical terminology system—Systematized Nomenclature of Medicine—included many of the terms experts said were needed to assess the quality in nursing homes in three domains:

pain management, incontinence, and pressure ulcers (ASPE 2003). However, this study also found that the Minimum Data Set (MDS)—the only tool examined—did not adequately gather the data elements the experts said were necessary to evaluate these aspects of care. In addition, the researchers of the study reported that most of the information the MDS gathered was not covered by any of the three medical terminology languages examined—this lack of coverage would seriously limit the meaningful integration or exchange of these data. An ASPE-led group of federal agencies involved with disability (such as the Veterans Administration and the Social Security Administration) also concluded that no standardized terminology provided sufficient coverage of the functional status concepts needed by the federal government, including the functional status concepts reflected in the three post-acute assessment instruments.

In a separate study, ASPE also examined the use of advanced electronic health records (EHRs) in skilled nursing facilities (SNFs). In a set of site visits to SNFs that have state-of-the-art electronic health records, ASPE found that SNFs typically did not integrate information stored in the EHR and the patient assessment tools. As a result, the detailed clinical information housed in the EHR was not available to the patient assessment tool, and vice versa. ■

**FIGURE 5-2**

**Distribution of SNF stays, by length of stay, in 2001**



Note: SNF (skilled nursing facility).

Source: MedPAC analysis of SNF stay file for SNF admissions in 2001.

The SNF daily rate consists of two component base rates—one for nursing and one for therapy—that are case-mix adjusted up or down depending on the patient’s relative resource use. Under a PPS, adjusting the base payment rates for case mix gives providers equal incentives to treat patients who require different levels of resources. CMS developed the nursing and therapy base rates from 1995 SNF costs inflated to 1998 (the first year of the PPS phase-in for SNFs) according to rules prescribed in the Balanced Budget Act of 1997 (BBA).

Medicare’s payment system adjusts SNF nursing and therapy base rates for expected resource use employing weights associated with the each of 44 RUG–III categories. The 44 groups fall into 7 major categories: (1) rehabilitation, (2) extensive services, (3) special care, (4) clinically complex, (5) impaired cognition, (6) behavior only, and (7) reduced physical function. For rehabilitation groups, the payment system applies associated nursing and therapy indexes to the nursing and therapy base payment rates to adjust for relative resource

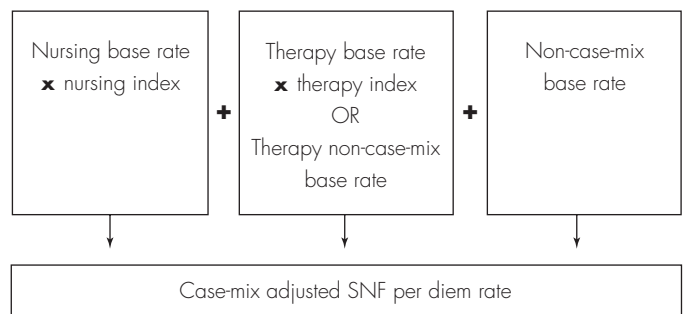
use of each category (Figure 5-3). The nonrehabilitation groups have a constant component for therapy instead of an adjusted therapy base rate. All RUG–III also have a constant “non-case-mix component” to cover costs that the payment system considered to be uniform across all patients, such as room and board. Once the base rates have been adjusted for case mix, the payment system adjusts a portion of the payment for geographic differences in labor costs using the hospital wage index.

The payment system’s assignment of a beneficiary to a RUG–III category is based on the number of minutes of therapy (physical, occupational, or speech) that the patient has used or is expected to use; the need for certain services (e.g., respiratory therapy or specialized feeding); the presence of certain conditions (e.g., pneumonia or dehydration); an index based on the patient’s ability to perform independently four activities of daily living (ADLs) (eating, toileting, bed mobility, and transferring); and in some cases, signs of depression. As we discussed earlier in this chapter, the payment system’s assignments of SNF patients to case-mix groups are determined by the SNFs’ required periodic patient assessments using the MDS. SNF staff assess patients using the MDS at the 5th, 14th, 30th, 60th, and 90th day of their stay. The assessment at day 5 determines Medicare payment for days 1 through 14 of the stay; assessment at day 14 determines Medicare payment for days 15 through 30 of the stay, and so on.

The first decision that determines a patient’s RUG–III assignment is whether that patient receives or is expected to receive at least 45 minutes of therapy per week (Figure 5-4, p. 122). If patients meet this therapy

**FIGURE 5-3**

**Determining case-mix adjusted SNF payment rate**



Note: SNF (skilled nursing facility).

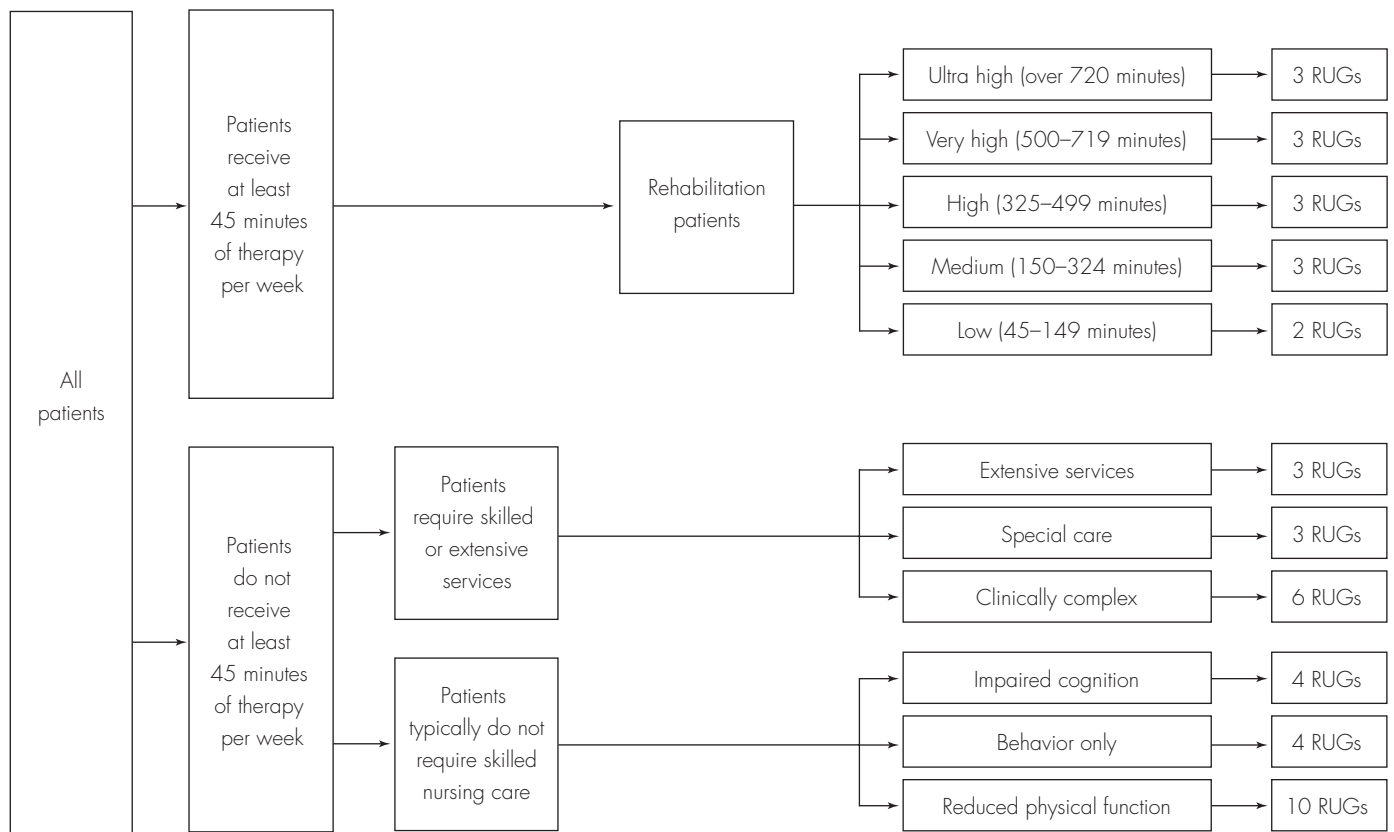
threshold, the classification system places them into one of 14 rehabilitation RUG–IIIs based on the number of therapy minutes per week, types of therapy, and ADL score. On the first MDS assessment, a patient can be categorized into a high, medium, or low rehabilitation group using an estimate of the amount of therapy that will be provided, rather than the actual amount provided, during the first two weeks. To be classified into one of the ultra high or very high rehabilitation groups on the first MDS assessment, patients must actually have received the minimum amount of therapy for a given group at the time that the SNF completes the patient assessment. For all subsequent assessments, the beneficiary must have already received the minimum amount of therapy that defines a group in order to be categorized in that group (GAO 2002).

The classification system categorizes patients who do not receive 45 minutes of therapy per week—but who have certain characteristics and still require skilled care—into the extensive services, special care, or clinically complex groups. Medicare typically does not reimburse SNFs for patients in the bottom three RUG–III categories because they usually do not require skilled care. CMS decides to reimburse for patients in these categories on a case-by-case basis.

The RUG–III system is hierarchical; beneficiaries may qualify for multiple categories, but the classification system assigns them to the highest payment category for which they qualify. For example, a patient could meet the criteria for being classified in an extensive-care RUG–III but could also receive enough therapy to be classified into

**FIGURE 5-4**

**RUG–III classification scheme**



Note: RUG–III (resource utilization group, version III).

Source: Figure adapted from GAO 2002.

a high-rehabilitation RUG–III.<sup>5</sup> In such a case, the patient would be categorized into the high-rehabilitation RUG–III that corresponded to his or her score on an ADL index, and Medicare would pay the SNF the high rehabilitation RUG–III rate.

## **A review of SNF PPS problems and potential improvements**

MedPAC, GAO, CMS, and the SNF industry have identified and discussed several shortcomings of the classification system since the implementation of the SNF PPS (CMS 2000a; Fries et al. 2000; GAO 1999; Kramer et al. 1999; MedPAC 2000, 2001, 2002; White 2003; White et al. 2002). Among the problems researchers have identified for improvements are the system’s payment for nontherapy ancillary services and payment for rehabilitation services according to the amount of service provided rather than patient characteristics. Various revisions to the PPS potentially can address current problems, but additional research is needed to assess the merits of any payment system alternative.

## **Payments for nontherapy ancillary services not adequately addressed by case-mix system**

The BBA required that Medicare’s prospective payment bundle for SNFs include payment for NTAs, such as prescription drugs and respiratory therapy. In compliance with this mandate, CMS included the cost of NTAs as part of the total costs used to develop Medicare’s SNF base payment rates. However, NTA costs were not used to develop the RUG–III case-mix indexes that adjust the base payment rates according to patients’ resource use. Instead, the payment system distributes payments for NTAs using the weights that are used to allocate payment for nursing care. As a result, the payment system does not distribute payments for NTAs according to variation in expected NTA costs across different patient types.

The dispensing of medications is one service that illustrates the possible disconnect between staff time to provide a service and the cost of that service. For example, two medications may differ substantially in cost, but the staff time it takes to dispense the expensive drug and the inexpensive drug may be the same. In this case, the payment system does not adjust payments to the SNF dispensing the expensive drug to reflect the higher cost of the medication; instead payments are distributed equally according to staff time. SNFs that treat a higher-than-average share of patients with higher-than-average NTAs

will be disadvantaged by the payment system relative to facilities that treat a lower-than-average share of these patients. In addition, facilities may have an incentive to systematically avoid patients expected to have high NTA use or to stint on the provision of NTA services.

The current classification system may exacerbate the problem of the lack of case-mix adjustment for NTA resource use by assigning patients to the highest category for which they qualify in the RUG–III hierarchy. This classification method categorizes SNF patients with heterogeneous resource needs into the same groups and pays the same rate for them. For example, the classification system classifies patients with extensive service needs who also qualify for a rehabilitation RUG–III into a rehabilitation group. Similar to patients in the extensive services category, these extensive service/rehabilitation patients have, on average, higher staff time costs and much higher NTA and total costs than rehabilitation patients who do not also qualify for an extensive services category (White et al. 2002). However, the current SNF case-mix system does not recognize this variation because it does not adjust for case mix based on these NTA-related patient differences within payment groups. Failure to adequately differentiate among patients with varying resource needs means that Medicare is not paying accurately for patients, causing some patients to be more or less profitable for facilities than others.

Since CMS implemented the SNF PPS, researchers and CMS have given considerable attention to the failure of the case-mix system to account for variations in NTA costs (CMS 2000a). Researchers estimate that NTA costs represent, on average, about 16 percent of total costs (GAO 2000, White et al. 2002), but these NTA costs vary widely across patients (White et al. 2002). Researchers using 1995 data found that the RUG–IIIs predict approximately 40 percent of the variance in staff time but only 4 percent of the variance in per diem ancillary charges (Fries et al. 2000).<sup>6</sup> They also found that the RUG–IIIs accounted for 10 percent of the variance in total costs.

## **Current payment system allows higher payments for providing additional services**

Another criticism of the SNF PPS is that it determines the payment rate based on the amount of services the patient uses, or is expected to receive, rather than on patient characteristics and clinical appropriateness (MedPAC 2004, GAO 2002). However, those in favor of this feature

of the SNF PPS assert that categorizing and paying for the amount of therapy provided counters incentives in the PPS for SNFs to stint on therapies. The system has two incentives related to the provision of therapy. The first incentive is for SNFs to provide additional therapy to achieve a higher payment category even though the patient may not benefit from additional therapy. Second, because the payment system pays a fixed rate for ranges of therapy minutes provided—45 to 149 minutes (low), 150 to 324 minutes (medium), 325 to 499 minutes (high), 500 to 719 minutes (very high), and more than 720 minutes (ultra high)—providers face an incentive to provide the fewest number of minutes in the highest achievable payment category because therapy times at the bottom of the categories have the lowest cost relative to revenue (Wodchis 2004, White 2003).

Several studies have found evidence that SNFs may have responded to therapy-related payment incentives in the PPS. Consistent with the incentive to classify patients into rehabilitation groups since implementation of the PPS, more patients were categorized into high and medium rehabilitation groups and fewer into the highest and lowest categories at patients' initial assessments (GAO 2002, OIG 2003). Providers' payments for these high and medium rehabilitation groups reportedly had the highest payment relative to costs (GAO 2002, White 2003). White also found that the proportion of residents receiving no rehabilitation therapy also declined between 1997 and 2000. Consistent with incentives to provide minutes of therapy at the low end of the range for a given payment category, patients in the medium and high rehabilitation categories—upon their initial assessment—received at least 30 fewer minutes of therapy per week in 2001 than in 1999; half of the patients initially categorized into these two groups did not actually receive the minimum minutes to be classified in these groups (GAO 2002). GAO explained this latter finding, in part, by more patients being classified using estimated rather than actual therapy minutes (GAO 2002). Changes in patient characteristics could have contributed to these changes, but the Office of Inspector General (OIG) did not find substantial shifts in the gender, race, age, or reason for eligibility of Medicare beneficiaries who used SNFs from January 1999 to December 2002 (OIG 2003).

### **Refining the RUG-III system to address NTA payment**

Recognizing the problem of the payment system's failure to properly distribute payments for NTAs, CMS undertook

research “to review the RUG-III classification system with particular emphasis on the care needs of medically complex Medicare beneficiaries and the variation in nontherapy ancillary services within RUG-III categories” (CMS 2000a). To evaluate potential improvements to, but not replacement of, the RUG-III system, CMS awarded a contract to Abt Associates, Brown University Center for Gerontology and Health Care Research, and the University of Michigan's Institute of Gerontology in 1999 (Fries et al. 2000). These researchers found, among other things, that patients in the extensive services category had higher NTA costs than patients in other categories.

In their final report in 2000, the contractors recommended that CMS consider adding 14 new groups to the top of the RUG-III hierarchy for SNF patients who qualify for the rehabilitation and extensive services category. This proposal was called the “RUG-III+ model,” which had 58 payment groups instead of 44. However, this change alone did not directly address the NTA payment issue. To address the failure of the case-mix system to distribute payment for NTA costs, the contractors also proposed applying a weighted or unweighted nontherapy ancillary index model to the new RUG-III+. Researchers developed these indexes from MDS items (e.g., suctioning, tracheostomy care, IV medication) that were found to be significantly related to per diem nontherapy ancillary (drug, respiratory therapy, and other ancillaries) costs. The index would determine an additional payment for nontherapy ancillary care for each day of SNF care.

Based on the contractors' findings that this refined case-mix system had improved ability to predict variance in total and NTA costs, CMS issued a proposed rule in April 2000 to refine the case-mix system using the RUG-III+ and the unweighted index model (CMS 2000a). But in the July final rule, CMS announced the results of testing the models on post-PPS national-level data (CMS 2000b). CMS found that these models did not improve the ability of the case-mix system to explain cost variance enough to warrant changing the SNF payment system. Therefore, CMS did not implement the refinements in the proposed rule.

Although this specific model proved less successful when tested on later, national-level data, an index that is similar in concept could again be developed from national-level data to explain NTA costs. Additional research to identify variables that better predict NTA costs would be required.

## **Outlier policy may not be optimal way to address NTA payments**

Some have suggested that the Medicare PPS for SNFs should have an outlier policy to pay for high-cost patients. Many Medicare PPSs for other settings include an outlier policy that recognizes the extraordinary costs of certain cases and defrays some of these costs that exceed certain cost thresholds. Ideally, such a policy does not undercut incentives to be efficient but at the same time encourages providers not to avoid especially costly cases and protects providers from unpredictable and unavoidable financial risks. An outlier payment can be a desirable policy in a PPS to prevent a provider from trying to avoid excessively costly patients and to protect providers from extreme financial losses. But the problem of consistent underallocation of payment for certain types of costs—such as NTAs in the SNF PPS—may argue more strongly for fundamentally refining the case-mix system to better distribute payments according to these costs rather than imposing an outlier policy.

Another feature of the SNF PPS—although not an outlier policy per se—may diminish the need for a SNF outlier policy. Certain high-cost, infrequently provided services such as ambulatory surgery performed in operating rooms, certain chemotherapy agents, and customized prosthetic devices are currently excluded from the SNF payment bundle and paid for separately (GAO 2001). This policy mitigates for providers the financial risk of treating patients who need these excluded services. By excluding high-cost, infrequently provided services from the payment bundle, CMS may reduce the number of cost outlier cases that might otherwise occur if these services were included in the per diem rate.

## **Alternative classification system using SNF patient characteristics**

One potential option that CMS could explore to improve the SNF PPS is replacing the RUG–III classification system with an entirely different classification scheme based on patient characteristics that are correlated with all SNF resource use. Before CMS implemented the SNF PPS, Cotterill tested the ability of a diagnosis related group (DRG)–based case-mix index to predict Medicare SNF patient resource use at the facility level (Cotterill 1986). Because a SNF stay follows a hospitalization, using the same classification method used to pay hospitals was appealing because, at the time, this method would not have required the development of a SNF-specific case-mix measure.

However, Cotterill also noted that DRGs may not be good predictors of care needs for SNF patients because of evidence that “diagnosis is not a strong predictor of differential use of nursing home resources for Medicare SNF patients.” A significantly positive relationship existed between SNF costs and the SNF diagnosis-based index, but the explanatory power in the SNF setting was weaker than the relationship between hospital costs and the hospital index. However, the diagnosis-based index was a better predictor of costs in SNFs that had a high share of Medicare patients than in facilities that had a low share of Medicare patients. One explanation for the DRGs’ relatively weak prediction of SNF patients’ resource use is that DRGs do not measure functional status, which researchers have found to be an important factor predicting post-acute resource use (Clauser and Bierman 2003).

A DRG-based case-mix index or a similar diagnosis-based case-mix system may hold some promise and appeal as an alternative payment classification system to RUG–III. A classification system based on patient characteristics may be less influenced by provider behavior than a classification system based on the amount of services provided. Similar to what Abt and colleagues proposed in their RUG refinement research, other variables such as measures of SNF patients’ functional status could possibly be added to a diagnosis-based system to predict SNF patients’ resource use. Again, additional research is needed to determine what variables explain cost variation in SNF patients and whether valid data are currently available to develop these variables. Such research could explore whether distinct, identifiable subgroups of patients exist in SNFs—subgroups that the current payment classification system does not capture. Examples of these subgroups include patients who have short stays and are recovering from acute conditions versus those who have longer SNF stays and become (or resume being) a nursing home resident.

## **SNF PPS revisions should address current shortcomings**

CMS should improve the PPS for SNFs to better distribute payments for patients with different resource needs. To accomplish this task, CMS would need to address the current shortcomings of the SNF PPS by better distributing payment for NTA costs and paying for care based on patients’ needs and characteristics rather than on the services SNFs provide.

CMS's report on the study—mandated in the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2002—of “the different payment systems for categorizing patients in Medicare skilled nursing facilities in a manner that accounts for the relative resource utilization of different patient types” should evaluate potential alternative systems for classifying patients and how those alternatives compare to the current system. The report on this study was due to the Congress on January 1, 2005, but as this MedPAC report was going to press, CMS had not provided their report to the Congress. It is not clear when CMS will release their report. However, MedPAC expects CMS to release a proposed rule that addresses potential payment system refinements in May 2005, and MedPAC will comment on any proposed payment system changes. We will also pursue analyses of different SNF payment system options—including refinements to the current RUG-III case-mix system, alternative patient classification systems, and various state-level nursing home payment systems—to determine the potential for any of these options to improve the SNF payment system.

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## Assessing the home health PPS

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CMS implemented the home health PPS on October 1, 2000. We began our assessment of the home health PPS in 2004 with an analysis of the PPS outlier provision. Our findings from that analysis, combined with other evidence, suggest that the current PPS may not be working optimally. This section expands upon that analysis. We briefly describe the current PPS, focusing on how the case-mix classification works; review some of the current problems with the PPS; and conclude with plans to further investigate the PPS.

### How does the current PPS buy home health services?

Medicare pays for home health service in 60-day units called episodes. Episodes begin when home health agencies admit patients to home health care. Most patients complete their course of care, and agencies discharge them, before 60 days have passed. If agencies do not complete patients' care within 60 days, another episode of payment may start without a break in their care.

Agencies receive a base payment of \$2,268 per episode for home health services in 2005. The base payment is

case-mix adjusted to account for differences in patients' expected resource needs, as reflected by their clinical and functional severity, recent use of other health services, and therapy use. Nurses or therapists record patients' conditions using OASIS, a standardized home health patient assessment tool, to score patients' health on admission. Figure 5-5 illustrates the OASIS items that describe the patient and the possible scores. The 80 case-mix groups—called home health resource groups (HHRGs)—in the home health PPS represent all combinations of the scores in the three domains (4 clinical  $\times$  5 functional  $\times$  4 service = 80 case-mix groups).

Payment also is adjusted for differences in local prices by the hospital wage index. Adjustments for several other special circumstances, such as unusually high costs or very short episodes, can also modify the payment.

### Some problems with the home health PPS

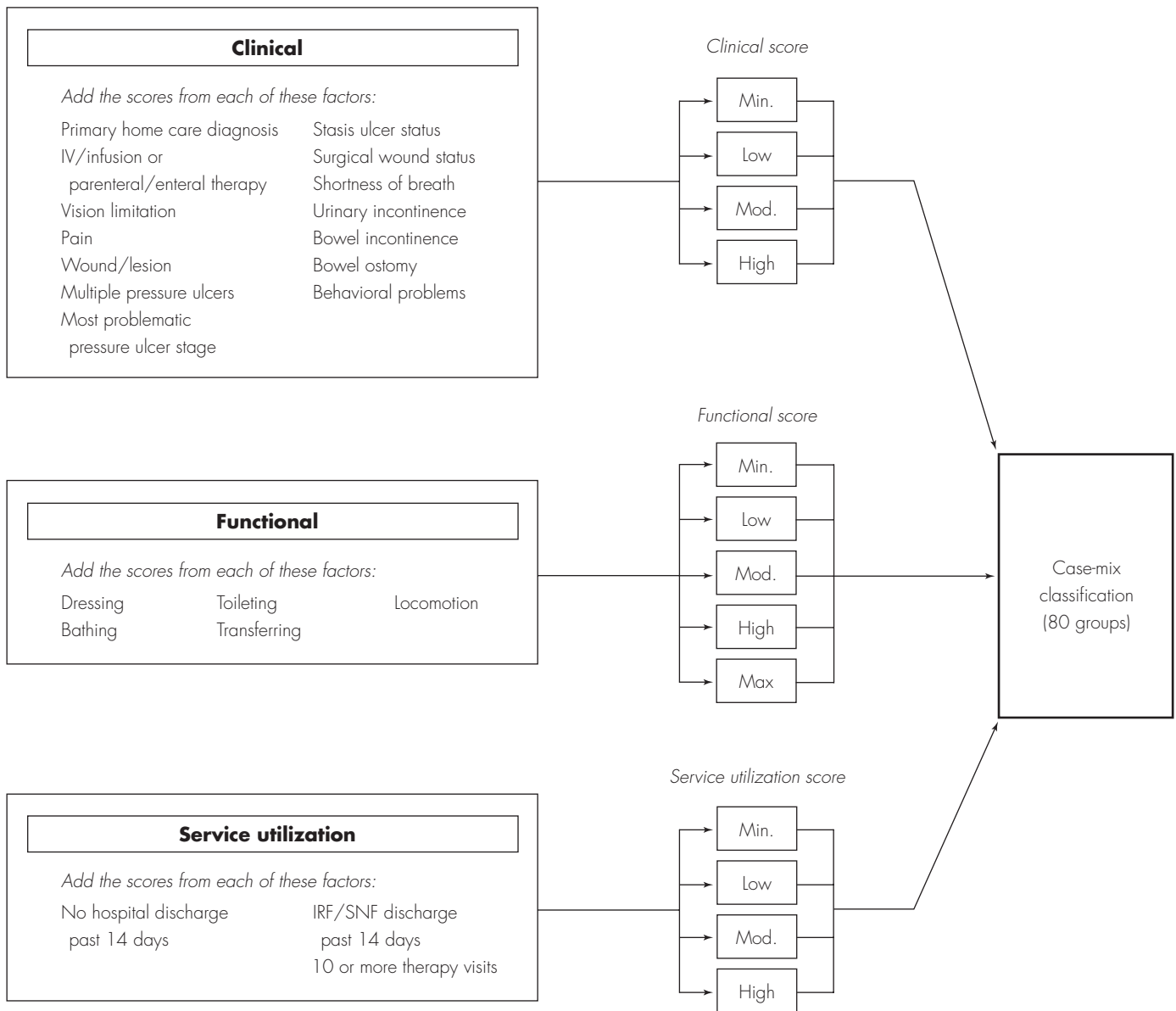
All PPSs are likely to suffer from several “pathologies” (Newhouse 2002). Among them is the failure to account for economies of scale. Also, if small providers draw an unfavorable mix of patients, they may be disadvantaged by a system that depends on relatively more profitable patients “subsidizing” the costs of relatively less-profitable ones to pay appropriately on average. Furthermore, the case-mix system within a PPS frequently fails to account for variations within case-mix groups. These problems lead to a mismatch of payments and costs at the patient and agency level. Evidence suggests that the home health PPS shows symptoms of each of these pathologies. Finally, Medicare's PPSs pay the same amounts regardless of quality.

The PPS does not account for economies of scale; smaller agencies have higher per-episode costs because they spread their overhead costs over fewer episodes. The GAO found evidence that fixed overhead costs had a significant impact on agencies' performance under the PPS (GAO 2004). Home health agencies' overhead includes legal, accounting, and data processing services; taxes; malpractice insurance; and office and equipment rental. Agencies with poor financial performance spent more than twice as much as well-performing agencies on overhead, and poorly-performing agencies had 25 percent fewer visits. GAO concluded that agencies' small size caused some of the difference in overhead costs per visit; however, additional factors appeared to be at work because nearly 20 percent of well-performing agencies were also small in size.



**FIGURE 5-5**

**Clinical, functional, and service information from OASIS determines patients' home health case-mix classification**



Note: OASIS (Outcome and Assessment Information Set), IV (intravenous), IRF (inpatient rehabilitation facility), SNF (skilled nursing facility).

Source: CMS 2000c.

Small agencies could also have more difficulty with a PPS because it pays on the basis of averages. The greater the number of cases an agency has in a given case-mix group, the more likely the agency's average cost for that case-mix group will equal the national standard upon which the

payment for the case-mix group is based. If a small agency has only one or two cases in a given case-mix group, then the agency's average costs for that group will likely be higher or lower than the national standard. If agencies do not have enough patients with lower-than-average costs in

some case-mix groups to offset the patients with higher-than-average costs in others, then they could be underpaid. Researchers noted the potential for difficulties for small agencies (Phillips et al. 1992). When testing several case-mix models for the PPS, the developers found that small agencies (ones with 200 or fewer episodes in a year) under a PPS would be somewhat more likely than medium agencies to be under- or overpaid in a given year by at least 5 percent. Furthermore, small agencies would be more than twice as likely to be under- or over-paid than large agencies (ones with more than 925 episodes).

Another PPS pathology is the failure to account for large variations of costs within case-mix groups. In the March 2005 report, MedPAC noted the wide variation in the number of minutes that nurses, therapists, aides, or social workers spent with patients during an episode in the same case-mix groups. We measured the average number of minutes of service per episode for each case-mix group, as well as the amount of variation around each of those averages. In more than half of the 80 case-mix groups in this system, the coefficient of variation for minutes per episode was greater than 1. A coefficient of variation of 1 or greater implies that the standard deviation is equal to or greater than the average, indicating very wide variation. Although the congruence between costs and minutes of service may not be one-for-one, the weak relationship between minutes and case mix suggests that the home health PPS case-mix system may fail to fully account for variation in costs within payment groups.

The handful of HHRGs with very small numbers of patients may compound the problem. As noted earlier, the 80 HHRGs represent every combination of each level of clinical and functional severity and service use; the HHRGs for maximum clinical severity and minimum functional limitation are populated only by a few patients each year (one such HHRG had only 45 patients nationwide in 2001; another had only 100 patients). Such small numbers of patients contribute to inconsistency in the average service use and cost of care for the HHRG. Perhaps CMS should consider merging these small HHRGs into larger, similar HHRGs.

The home health PPS pays the same amount for high- and low-quality care, as do all of Medicare's payment systems. MedPAC recommended in March 2005 that CMS should align the incentives of payment systems with incentives for quality (MedPAC 2005). We found that the home

health setting was ready for pay for performance and that a portion of the payments should be linked to achieving a high level of patient outcomes or improving the proportion of patients who achieve good outcomes. Pay for performance is especially important in the home health setting because the product definition is not strong; under pay for performance, some dollars are linked directly to what Medicare truly wants to buy: better health for beneficiaries.

### **Home health product has changed since CMS designed the case-mix system**

Substantial changes in the home health care product that have occurred since the system was designed could limit the system's ability to account for current differences among agencies and for differences among case-mix groups. Abt Associates designed the case-mix system under contract with CMS in 1999 (Goldberg et al.) using claims from October 1997 through April 1998. At that time, the payment system was cost based; agencies could generate more revenue by providing more visits. HHAs had an incentive to deliver more visits and were responding to that incentive in 1996 and 1997, admitting more beneficiaries and providing more visits than ever before.

Since the contractors developed the case-mix system, the PPS has substantially changed agencies' incentives. First, the prospective payment limits an agency's ability to increase revenue by increasing visits because payment is *mostly* determined by patients' conditions rather than the amount of service delivered. The case-mix system has reversed the incentive for more visits. Second, the portion of the PPS payment that is not based strictly on patients' conditions is the additional payment for delivering at least 10 therapy visits. Meeting the therapy threshold produces substantially higher payments for otherwise similar patients. For example, an episode for a patient with moderate clinical severity and moderate functional limitation would be paid \$2,440 (base payment  $\times$  case weight 1.08) if the episode did not meet the therapy threshold and \$4,420 (base payment  $\times$  case weight 1.95) if the patient did meet the therapy threshold. In this example, the difference between the two patients could be minimal; they may have the same diagnosis and the same level of functional limitation, but one patient may have received 9 therapy visits and the other may have received 10. This may be a strong incentive to shift the mix of visits toward therapy to meet the 10-visit threshold for higher payment.

Agencies have decreased the number of visits per episode and increased the amount of therapy delivered as a proportion of those services, thus substantially changing the product of home care from the one that Abt used to calculate the case-mix weights. These changes are fairly substantial: Visits declined 47 percent, minutes declined 37 percent, and therapy increased as a proportion of all visits by 17 percentage points (Table 5-9). The relative resource needs calculated for each HHRG in 1999 are probably not correct today because it seems unlikely that these substantial changes to the home health product occurred evenly in each HHRG. Some HHRGs probably changed more than others, which could affect their resource intensity relative to those HHRGs that were less affected.

These changes in the product have led many to wonder whether quality of care has declined as a result. Older studies found small but significant benefits from higher numbers of visits; newer results seem to challenge that conclusion. The text box on the next page discusses some evidence on this point.

### Plans for future research

The evidence we have cited in this chapter suggests problems with the home health PPS. To accurately identify the source of the problem, we need to conduct more research. If the case-mix system is not working well, we may be able to detect patterns in the costs and claims data. MedPAC will pursue the following questions in future research:

- How well do the relative weights match the minutes of service in each HHRG?
- How well do the relative weights match the reported costs of care in each HHRG? We will explore several different models for cost.
- Does the case-mix adjustment work better for some types of beneficiaries than others? Specifically, are there subgroups of beneficiaries whose care needs are not well anticipated by the current case-mix system? We will explore groups of users who are post-hospital and non-post-hospital, who are with and without an informal caregiver, who are qualified for both Medicare and Medicaid, who have multiple markers of frailty, who have cognitive disabilities, or who are young and have disabilities.

**TABLE  
5-9**

**The home health product changed between 1997 and 2002**

	1997	2002
Average visits per episode	36	19
Average minutes per episode	1,500	940
Percentage of therapy visits	9%	26%

Source: Goldberg, H. B., D. Delargy, R. J. Schmitz, et al. 1999; MedPAC analysis of 20 percent of CMS Datalink file; and MedPAC analysis of 5 percent Standard Analytic File of home health claims.

CMS may wish to consider a recalibration of the weights as the first step in improving the current PPS. CMS recalibrates the weights of the inpatient acute-care hospital PPS on a regular basis to maintain their accuracy. Alternatively, more substantial changes to the system could be considered, such as mixing prospective payment with retrospective payment or limiting agencies' profits and losses or paying differently for different types of care. ■

## Is more home health service better?

Early research suggested small but significant differences between the quality of outcomes for patients who received more home health care and patients who received less. However, more recent studies appear to challenge that conclusion. Research by Baker, Gill, and others links inactivity and decline in older adults; perhaps too much care, especially aide care, for homebound patients may promote inactivity on the part of the patient and thereby worsen the patient's condition (Gill et al. 2002).

Schlenker, Shaughnessy, and Hittle (1995) found fee-for-service beneficiaries received more visits, had higher costs, and achieved better functional outcomes than beneficiaries in managed care plans. This would suggest that more home health care is better for patient outcomes.

More recent evidence is mixed. Hadley and colleagues (2000) used an instrumental variable approach to estimate a very small but statistically significant difference between the functional outcomes of home health users and nonusers in the six months following hospitalizations. After controlling for the differences between users and nonusers, they found that home health users improved their functional status by 219 points on a 5,363-point scale, compared to nonusers (all patients had an average score of 875 points). The authors note that more research is needed about home health care that does not follow a hospitalization and home health care that is long term; it may not be appropriate to generalize the results to those populations.

In their study of eight states, 44 HHAs, and more than 700 episodes, Brega and colleagues (2002) conclude: "Patients receiving more frequent visits experienced

marginally better outcomes of home care than did patients with less frequent visits." Their outcomes included 27 measures of improvement in activities of daily living.

An examination of the relationship between the amount of home health service and patient satisfaction found that decreasing amounts of home health service did not decrease beneficiaries' satisfaction with the agency, their discharge, or nursing or therapist care (McCall et al. 2004). The researchers did find a decrease in satisfaction with fewer personal care services, though they note that "there was concern [before the decrease in services] that the benefit was increasingly being used to provide personal care services for beneficiaries having no skilled care need."

Since the implementation of the PPS and the attendant decline in the average number of visits, patient outcomes of care have shown a slight improvement, as measured by CMS's Home Health Compare (MedPAC 2005). More home health patients have improved their ability to dress themselves, walk, and conduct other activities of daily living even though they are receiving a lower number of visits than they did in the past. Also, Hogan (2004) found that from 1996 to 2002, "there was a statistically significant decline in re-admission and an increase in percent of episodes ending in return to the community." The Hogan study made some adjustments to account for changes in the patient population; the Home Health Compare data do not. The latter study also found that potentially avoidable hospitalizations as a fraction of all readmissions also declined, further suggesting that quality of care did not decline as the number of visits per episode fell. ■

## Endnotes

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- 1 A small number of patients (about 17,000 out of 426,000) included in the study sample had bilateral (both knees or both hips) replacements.
- 2 Fourteen percent of IRF patients are discharged at 14+ days; 31 percent of SNF patients have a 14-day assessment.
- 3 RAND standardized the rates for IRFs and SNFs to remove the effect of differences in area wages.
- 4 The MDS estimate was made by CMS (2002). One study found that the MDS for Post-Acute Care, a tool that is similar to the MDS, took an average of 85 minutes to complete once 10 or more assessments had been done (Buchanan et al. 2003). The OASIS estimate was made by the National Association for Home Care (St. Pierre 2005). The IRF-PAI estimate was done by researchers at Harvard University (Buchanan et al. 2003).
- 5 To qualify for the extensive services category, patients must have, in the past 14 days, received IV medications, received tracheostomy care, required a ventilator/respirator, required suctioning, or must have received IV feeding in the past 7 days. In addition, the patients assigned to this category must have a minimum ADL score of 7.
- 6 The study conducted by Fries and colleagues used staff time data from CMS Staff Time Measurement studies as a measure of staff time costs (Fries et al. 2000). Studies that attempt to measure the variance in costs explained by the RUG-III case-mix system must define the dependent variable (cost) using available, but limited, administrative data. Specifically, facility-level nursing and other cost data are not directly available from the Medicare cost reports, and data are not available for determining costs at the individual beneficiary level.

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