

CHAPTER

5

Monitoring post-acute care

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In response to rapid growth in post-acute care spending, the Balanced Budget Act of 1997 and subsequent legislation mandated use of prospective payment systems for all post-acute settings. Monitoring efforts are important to assess the impact of these new payment systems on patterns of care. Examining changes before and after the implementation of prospective payment for skilled nursing facilities (SNFs) and home health care—the two most frequently used post-acute settings—we find substantial declines in use of home health care, increases in use of skilled nursing facilities and other post-acute providers, and some substitution of SNFs for home health services following hospital discharges.

We compare patients using long-term care hospitals (LTCHs)—the most expensive and least frequently used post-acute setting—with patients in other settings in 2001. In our preliminary findings, we find that LTCHs and SNFs appear to be substitutes. We also find that LTCH patients have higher mortality rates and Medicare pays more for their care, compared with patients who do not use LTCHs. The higher mortality rates might reflect unmeasured case mix. Further research is needed to determine whether we continue to see these patterns once we control for other factors. Further research also is needed to understand the role LTCHs play in providing acute and post-acute care, particularly how outcomes for this setting compare with those for similar patients in other care settings.

In this chapter

- Patterns of beneficiaries' use of post-acute care pre- and post-PPS
 - Comparing beneficiaries treated in long-term care hospitals and other settings
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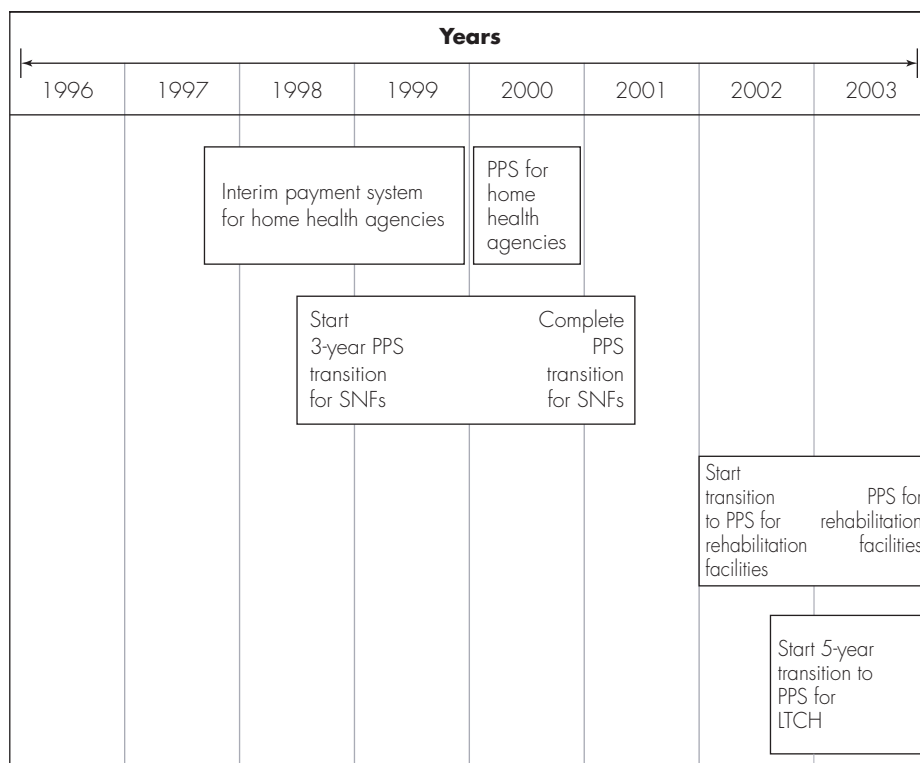
Post-acute care generally follows an acute hospitalization and is provided in four settings—skilled nursing facilities (SNFs), inpatient rehabilitation facilities, long-term care hospitals (LTCHs), and the home. Medicare beneficiaries use post-acute care frequently: In 2001, almost one-third of beneficiaries discharged from acute hospitals used post-acute care. Post-acute care includes eligible beneficiaries referred from the community using home health care without a prior hospitalization.

Post-acute care is a health sector characterized by extremely rapid growth in providers, beneficiaries' use, and spending. For example, between 1988 and 1997,¹ Medicare spending for post-acute care services increased at an average annual rate of 25 percent. Reacting to this rapid growth, in the Balanced Budget Act of 1997 (BBA) and subsequent legislation, the Congress required new prospective payment systems (PPSs) for beneficiaries' care in all four post-acute settings. Medicare's system of post-acute care payments is being converted to prospective payment one setting at a time (Figure 5-1).

Monitoring the impact of these payment system changes requires that all settings of post-acute care should be studied together, in addition to studies of individual settings. For the typical diagnosis related group (DRG), beneficiaries can be discharged to different types of post-acute providers. For example, heart failure and shock is among the top five diagnosis related groups for patients referred to LTCHs, SNFs, and home health care. Patients with identical DRGs may use different post-acute providers because of a number of factors. The patients may have different levels of functional limitation, differences in severity of illness within a given DRG, or personal preferences. The supply of providers, Medicare's eligibility requirements (see text box, opposite), and local practice patterns also may influence what type of post-acute care patients receive. In addition, some beneficiaries use multiple types of post-acute providers in a single episode.

FIGURE 5-1

Time line of Medicare payment changes for post-acute care



Note: LTCH (long-term care hospital), PPS (prospective payment system), SNF (skilled nursing facility).

In this chapter, we examine preliminary results from two ongoing research projects. In the first section, we look at patterns of beneficiaries' use of services across post-acute care before and after implementation of the PPSs for SNF and home health care. Our analysis finds that use of all post-acute care except for home health care increased between 1996 and 2001. The use of home health care substantially declined for both beneficiaries referred following a hospital stay and for those referred from the community. For posthospital home health users, the greatest decline in 2001 was for those patients with diagnoses that had low post-acute care use in 1996. For some diagnoses, we observe that SNF use in 2001 may be partly replacing home health services. For community-referral home health users, the greatest decrease in 2001

was for patients who had lower probability of using home health services in 1996.

In the second section of this chapter we examine a specific post-acute setting—long-term care hospitals—and how patients treated there differ from patients treated in other settings. LTCHs are the post-acute setting least used by beneficiaries and are not available in many areas. In general, policymakers regard rapid growth in any sector as a phenomenon that requires examination. As the number of long-term care hospitals has almost doubled since 1993 and Medicare spending for such care has almost quintupled from 1993 to 2001, questions have arisen about whether beneficiaries using LTCHs are different from patients using other settings. Our analysis found that patients in market

1 In 1988, major changes in beneficiaries' eligibility for home health and SNF services occurred; in 1997, the Congress passed the Balanced Budget Act of 1997.

Medicare coverage rules, eligibility criteria, and conditions of participation

Medicare's policies for post-acute care—coverage rules and eligibility criteria and conditions of participation—vary by setting. Several examples illustrate these difference in coverage rules and eligibility criteria. Medicare coverage for skilled nursing facility (SNF) care requires beneficiaries to have had a three-day hospitalization in the previous month. SNFs are the only post-acute setting to have a posthospital requirement. In addition, the beneficiary must require daily skilled nursing or rehabilitation care. To be admitted to an inpatient rehabilitation facility—but not to a long-term care hospital, a SNF, or a home health agency, all of which may offer rehabilitation services—patients must be able to sustain three hours of daily therapy (physical, occupational, speech, or a combination) and have the potential to reach predetermined goals. To obtain home health services, patients must be homebound (unable to leave their residence without considerable and taxing effort) and

require part-time or intermittent skilled nursing care or therapy. Medicare has no eligibility requirements for patients admitted to long-term care hospitals (LTCH) other than that they must require acute care.

Post-acute providers must also meet different conditions of participation. For example, physicians must be integrally involved in care provided in rehabilitation facilities and long-term care hospitals, but are required to visit a SNF patient only once every 30 days for the first 90 days and every 60 days thereafter. Requirements for physician involvement in home health care are even less stringent. Rehabilitation facilities are required to have 75 percent of their admissions in 1 of 10 specific diagnoses related to conditions requiring rehabilitation services. LTCHs' only condition of participation in addition to those required of all hospitals is to have an average Medicare length of stay greater than 25 days. ■

could reflect appropriate sorting according to the capabilities of particular settings and patient needs.

The availability of multiple sites of care requires monitoring use of post-acute care in its entirety, not one provider at a time. Consequently, MedPAC developed an episode-of-care database that permits us to assess post-acute care use throughout the continuum of care. The episode database consists of 1996 through 2001 Parts A and B claims and enrollment data for a 5 percent sample of beneficiaries in traditional Medicare. For each beneficiary, we aggregate consecutive post-acute care use into an episode by linking claims submitted by SNFs, home health agencies, rehabilitation, long-term care, and psychiatric facilities. This enables us to examine episodes of post-acute care following discharge from acute-care PPS hospitals, as well as episodes of home health care not preceded by a hospital discharge (referred to as “community-referral home health services”). The text box on page 74 provides additional information about how the episodes of care were constructed, defined, and classified.

In this section, we present results of an analysis that compares episodes of post-acute care use in 1996, before the implementation of any of the prospective payment systems (pre-PPS period), to 2001, after the PPS for SNFs and home health services started (post-PPS period). Direct Research LLC, under contract to MedPAC, developed the episode database and conducted the analysis (Hogan 2003). Key findings include:

- Medicare spending for post-acute care services in aggregate declined by almost 10 percent between 1996 and 2001, due to a nearly 50 percent decline in spending for home health services. For all types of post-acute care, the average length of an episode and the number of episodes per beneficiary declined between 1996 and 2001, but the total number of episodes and spending increased for episodes not involving home health services.

areas with LTCHs had similar acute hospital lengths of stay regardless of whether they used long-term care hospitals or not. Patients who used these hospitals were three to five times less likely to use SNF care, suggesting that SNFs and LTCHs may be substitutes. Compared with similar patients who did not use long-term care hospitals, total payments and mortality rates for LTCH patients were considerably higher. Our findings suggest that further research is needed to determine if these patterns continue when we control for other factors and to understand the relationship between quality outcomes and the high cost to Medicare of care in this setting.

Patterns of beneficiaries' use of post-acute care pre- and post-PPS

Medicare payment for post-acute care services is undergoing substantial change. Monitoring is needed to examine whether shifts in the site of post-acute care have occurred. Medicare covers multiple sites of post-acute care and the potential exists for substitution of services among these alternative settings. Changes in service volume among settings could indicate that providers are shifting beneficiaries' care in response to financial incentives reflecting unwarranted disparities in payment rates; alternatively, such shifts

Constructing the post-acute care episode database

The episode database consists of Medicare Parts A and B claims and enrollment data for a 5 percent sample of beneficiaries enrolled in the traditional Medicare program. The post-acute providers tracked in this analysis include: home health agencies; skilled nursing facilities (SNFs); and long-term care, rehabilitation, and psychiatric facilities. This section describes the two main steps in developing the database: defining episodes and classifying episodes.

Defining episodes. Episodes of care begin with either: (1) being discharged from an acute hospital to post-acute care, or (2) using community-referral home health care—that is, home health care that is not preceded by a discharge from an acute hospital. Linking the acute hospital discharge or initial home health claim to all subsequent bills for post-acute care providers created episodes of care. The episode terminates when:

- there is a break of 31 (alternatively 60) days between post-acute care bills, or
- the beneficiary is readmitted to an acute hospital, dies, or is admitted to a hospice.¹

MedPAC has previously used this method to define an episode of post-acute care (Hogan 2000). We assessed the sensitivity of the 31-day break on

our results by creating episodes of care using a 60-day break. Analyses of both sets of episodes show similar patterns of use and spending for post-acute care in 1996 and 2001.

Beneficiaries may have multiple episodes of care within a given year. Admission to an acute hospital may both terminate one episode and start a subsequent post-acute episode upon discharge. This episode definition is based on timing only, and does not reflect any consideration of diagnoses on the records. The diagnoses on the hospital discharge do not have to match those on the post-acute care records. In theory, a discharge might fall within an unrelated home health episode, triggering the start of a new episode based on our definition. In practice, few beneficiaries have more than one episode of care during the year, so the presence of such post-acute care is likely to be minimal.

Classifying episodes. We classified episodes of care based on the specific post-acute providers furnishing care and whether the episode might have been truncated by the start or the end of the calendar year. An episode can combine different types of post-acute providers, in different sequences. That is, there are not just episodes of SNF care and episodes of home health care, but also episodes of SNF followed by home health, home health followed by SNF, and other combinations. Our

analysis uses 1996 and 2001 data, so an episode may be truncated by the beginning or end of the calendar year. A final post-acute provider bill in December could mean successful return home, or possible continuation of the episode beyond the end of the year.

Truncation at the start of the year may also result in a few “broken” episodes, for example, use of SNF services without preceding hospital discharge.

Consequently, an episode following hospital discharge is classified into one of the following five groups:

- home health care only;
- SNF care only;
- SNF care followed by home health care;
- care furnished by long-term care, rehabilitation, or psychiatric facilities; or
- other combinations of care furnished by SNFs or home health providers, including SNF stays truncated by the beginning of the year and home health followed by SNF care.

A community-referral home health episode is classified as either not truncated by the start or end of the year; or truncated by the start or end of the year. ■

¹ Death dates on the denominator file are typically only recorded to the month (not day) of death. Episodes counted as terminating in death if either the post-acute care bill indicated death or the beneficiary died during the month in which the last post-acute bill was recorded. Home health care bills, in particular, often do not report the beneficiary as discharged dead from home health.

- There was an increase in the proportion of users 85 years and older who used post-acute care, including home health services, following hospital discharge and community-referral home health services in the post-PPS period. Other demographic and clinical characteristics of post-acute care users did not substantially change between 1996 and 2001.
- Use of post-acute care following hospital discharge declined by 6 percent due to the 10 percent decline in posthospital home health care use between 1996 and 2001. By contrast,

use of SNFs and other post-acute providers increased in the post-PPS period. In addition, the declines were not uniform across DRGs. Overall use of post-acute care increased for DRGs with the highest rates of post-acute use in 1996. On average, the lower the rate of post-acute care use for a DRG in 1996, the proportionately greater the decline in the use of post-acute care services between 1996 and 2001.

- Episodes of community-referral home health care declined by about 50 percent between 1996 and 2001, more than the decline in the total number of episodes of care. Beneficiaries with high and low predicted use—based on their demographic and clinical characteristics and 1996 patterns of use—experienced declines. However,

reductions were disproportionately concentrated among beneficiaries with low likelihood of use.

Changes in the number and length of episodes

The total number of episodes per user declined by 10 percent, from 1.57 to 1.42 episodes per user in 1996 and 2001, respectively. The decline in the number of episodes was not uniform across the different post-acute care settings (Table 5-1). Although episodes involving home health care decreased, episodes involving other types of care increased. Between 1996 and 2001, episodes consisting of home health as the sole post-acute setting following hospital discharge declined by nearly half; by contrast, SNF-only episodes increased by 28 percent and episodes consisting of other post-acute providers increased by 33 percent. Consistent with the decline in episodes

involving home health care following hospital discharge, community-referral home health episodes declined by more than half between 1996 and 2001.

The length of all types of post-acute episodes also declined between 1996 and 2001 (Table 5-1). SNF-only episodes had the smallest decline, with an average reduction of 12 percent. By comparison, the average length of home health episodes following hospital discharge declined by 28 percent.

Changes in spending

The nearly 10 percent decline in aggregate spending for post-acute care, from about \$33.7 to \$30.6 billion in 1996 and 2001, respectively, is due to the 50 percent decline in spending for home health services, which totaled \$8.6 billion in 2001.² Total spending for other post-acute care providers increased between 1996

TABLE 5-1

Changes in the spending for and duration of post-acute care episodes, 1996 and 2001

Episode type	1996			2001			Change between 1996-2001		
	Number of episodes	Payment per episode	Days per episode	Number of episodes	Payment per episode	Days per episode	Number of episodes	Payment per episode	Days per episode
All episodes	341,382	\$4,574	70	247,790	\$5,695	46	-27%	24%	-34%
Care following hospital discharge									
SNF only	52,710	5,375	29	67,647	6,426	26	28	20	-12
Home health only	108,529	2,383	60	59,101	2,204	43	-46	-7	-28
SNF + home health	21,523	8,442	78	18,745	9,053	64	-13	7	-19
Other providers	23,517	13,927	53	31,163	13,492	38	33	-3	-28
Mixed provider use	8,036	5,811	49	9,372	6,113	37	17	6	-25
Community-referral home health									
Not truncated by calendar year	66,127	2,229	55	35,969	2,607	48	-46	17	-13
Truncated by calendar year	60,940	5,191	144	25,793	4,063	101	-58	-22	-30

Note: SNF (skilled nursing facility). Other providers include long-term care and rehabilitation facilities. Mixed provider use includes other combinations of care furnished by SNFs or home health providers, including SNF stays truncated by the beginning of the year and home health followed by SNF care. These data show use of and spending for post-acute care services by a 5 percent sample of beneficiaries enrolled in the traditional Medicare program.

Source: Direct Research LLC analysis of 1996 and 2001 claims from CMS.

2 We inflated data from the 5 percent claims files from CMS by a factor of 20 to obtain national estimates of post-acute care users.

and 2001. For instance, aggregate payments for services furnished by SNFs, rehabilitation, and long-term care facilities increased by 37, 20, and 87 percent, respectively, between 1996 and 2001.

Although aggregate spending declined, overall spending per episode increased by 24 percent in the post-PPS period (Table 5-1, p. 75). This change is driven by the increase in spending per episode involving SNFs and community-referral home health services (not truncated by the calendar year). Spending for SNF-only episodes and community-referral home health increased by 20 and 17 percent, respectively. By contrast, spending per home health episode following hospital discharge declined by 7 percent.

The change in per capita spending for post-acute care services varied regionally. Use declined disproportionately in those states with the highest level of 1996 spending (Table 5-2). The 10 highest-cost states experienced the greatest decline in total episodes and days of care, total spending, and home health spending and the smallest percentage increase in spending for other post-acute providers. Conversely, the 10 lowest-cost states in 1996 had the smallest decline in the

number of episodes and days, and the largest increase in total spending, particularly for post-acute care other than home health. By 2001, there was a substantial leveling of post-acute use and spending across states.

For the nine census regions and urban and rural counties, changes in spending were steepest in those areas with higher numbers of episodes and days per episode in 1996. For instance, the East South Central and West South Central regions had the highest use of post-acute services in 1996 and experienced the largest decline in episodes per beneficiary, days per episode, total spending, and home health spending in the post-PPS period. Similarly, the counties with highest use of post-acute care in 1996 experienced the steepest decline in spending in the post-PPS period.³

Demographic and clinical characteristics of beneficiaries

The total number of beneficiaries using post-acute care decreased by 18 percent, from 4.3 to 3.5 million users in 1996 and 2001, respectively. However, the proportion of beneficiaries 85 years or

older using post-acute care increased in the post-PPS period. Between 1996 and 2001, the proportion of beneficiaries 85 years or older increased from:

- 27 to 30 percent for any post-acute care following hospital discharge;
- 20 to 22 percent for home health services following hospital discharge;
- 28 to 31 percent for SNF and home health services following hospital discharge; and
- 28 to 32 percent for community-referral home health services.

Other demographic characteristics remained relatively constant between 1996 and 2001. In both the pre- and post-PPS periods, women and African Americans comprised 63 and 11 percent, respectively, of post-acute care users following hospital discharge, and 67 and 14 percent, respectively, of community-referral home health users. Finally, beneficiaries' Medicare entitlement status and Medicaid buy-in status also remained relatively constant between 1996 and 2001.⁴

TABLE 5-2

Changes in the per capita use of and spending for post-acute care, by states' 1996 level of spending

	1996 per capita				Change between 1996–2001			
	Number of episodes	Days per episode	Total spending	Spending for home health	Number of episodes	Days per episode	Total spending	Spending for home health
Quintile of 1996 state spending								
1 (highest)	0.25	21.71	1,454	856	-33	-58	-29	-60
2	0.20	13.29	957	437	-23	-49	-5	-42
3	0.18	12.23	789	354	-24	-51	-3	-43
4	0.19	13.15	667	339	-27	-53	0	-36
5 (lowest)	0.15	7.79	535	216	-17	-44	18	-36

Note: States are categorized into five groups based on 1996 per capita spending for post-acute care by a 5 percent sample of beneficiaries enrolled in the traditional Medicare program.

Source: Direct Research LLC analysis of 1996 and 2001 claims from CMS.

³ The Department of Agriculture classified each beneficiary's county of residence into one of nine groups (urban influence codes) based on its population size and proximity to an urban area.

⁴ Medicaid buy-in status refers to a state Medicaid program paying for the Medicare Part B premium on behalf of a beneficiary.

We assessed clinical characteristics by classifying physician-reported diagnoses on Part B claims into 1 of 170 diagnostic cost groups (DCGs) and aggregated these categories into 13 groups.⁵ Few diagnosis groups changed by 5 percent or more between 1996 and 2001. The proportion of beneficiaries with blood disorders and mental dementia (using any post-acute care service) increased and the proportion of beneficiaries with cancer or HIV (using community-referral home health) and circulatory disorders (using any post-acute care service) decreased by more than 5 percent in the post-PPS period.

Changes in use of post-acute care following discharge from PPS hospitals

Overall, use of post-acute care following discharge from acute-care PPS hospitals declined from 40 to 34 percent between 1996 and 2001. This change was associated with a substantial decrease in the use of home health services and an increase in the use of SNFs and other post-acute providers. Between 1996 and 2001, episodes consisting of only home health services declined from 21 to 11 percent, while episodes consisting of only SNF services increased from 10 to 13 percent and episodes consisting of other providers increased from 4 to 5 percent.

The change in the use of post-acute care following hospital discharge was not uniform across all diagnosis related groups, however. DRGs with higher 1996 levels of post-acute care use experienced smaller changes between 1996 and 2001 than those with lower 1996 levels of use. For instance, post-acute care use increased by 3 percent between 1996 and 2001 for groups with the highest level of use in 1996. Conversely, post-acute care use declined by 32 percent between 1996 and 2001 for DRGs with the lowest level of use in 1996.

Aggregate use of post-acute care was relatively stable in 1996 and 2001 for the subset of discharges with DRGs previously found associated with use of SNFs and home health services (Table 5-3, p. 78). Not unexpectedly, DRGs with higher use of home health as the sole post-acute setting in 1996 experienced the largest increase in the proportion of beneficiaries not using post-acute care in 2001. The proportion of discharges from those groups using services furnished by other post-acute providers either remained the same or increased between 1996 and 2001.

Changes in use of community-referral home health services

As shown earlier in this section, episodes of community-referral home health care use declined by more than 50 percent between 1996 and 2001. At issue is whether the decline occurred disproportionately among specific groups of beneficiaries. As a first step in assessing changes, we compared actual 2001 use of these services to the level predicted based on 1996 patterns of care.⁶ We used ordinary least squares regression to predict 2001 levels based on beneficiaries' demographic and clinical characteristics and their 1996 patterns of care. The model classifies their clinical characteristics into 1 of 170 DCGs based on the diagnoses reported on Part B claims submitted by physicians.

Beneficiaries with high and low predicted use—based on their demographic and clinical characteristics and 1996 patterns of use—experienced declines (Table 5-4, p. 79). For beneficiaries with the highest predicted levels of community-referral home health care use, actual users of care were 54 percent of the predicted level. By contrast, for beneficiaries at the median, actual use was 34 percent of the predicted

level. Similarly, actual spending was 44 percent of the highest percentile's predicted spending level. For beneficiaries at the median, actual spending was 28 percent of the predicted level.

Implications and next steps

This analysis shows that the overall decline in the use of and spending for post-acute care between 1996 and 2001 was a consequence of the decline in beneficiaries using home health services following hospital discharge and community-referral home health services. This finding is not unexpected, as MedPAC has previously noted that the use of Medicare's home health benefit has changed considerably over the past ten years (MedPAC 2003). In 1990, fewer than 2 million beneficiaries used the home health benefit. Between 1990 and 1996, the number of users grew 85 percent, adding over 1 million beneficiaries to the number of users of the benefit. The trend reversed in 1997; by 2001, the number of users had fallen to around 2.2 million, still higher than the 1990 level. By comparison, the total number of beneficiaries increased 1 percent per year during this time.

Much of the drop in the number of users between 1996 and 2001 occurred under the interim payment system (IPS), implemented between 1997 and 2001. CMS designed the IPS to reduce spending for home health services, setting per-visit payment limits at 1994 levels, and also limiting per-beneficiary spending. In addition, about one-third of agencies that had recently begun participating in the Medicare program exited between 1997 and 2001 (MedPAC 2002b, 2000). A number of home health agencies reported changing the way they operated, being more careful about accepting long-term, chronic, or higher-cost beneficiaries (Abt 1999). The IPS did not adjust payments

5 Diagnostic cost groups are the underlying diagnosis groups in the system used to risk-adjust payment for plans participating in the Medicare+Choice program (Pope et al. 2000).

6 Basing our analysis on observed use in 1996 is the most conservative baseline for predicted use in 2001 because home health use was at its peak in 1996.

**TABLE
5-3**

Hospital discharge destinations for selected DRGs, 1996 and 2001

Percentage of discharges to:

Year	No post-acute care or hospice	SNF only	SNF + home health	Home health only	Other PAC providers	Hospice
DRG 014 Stroke with infarction						
1996	33%	22%	7%	18%	19%	1%
2001	36	24	6	11	20	3
DRG 088 Chronic obstructive pulmonary disease						
1996	65	6	2	25	1	1
2001	74	8	2	12	2	1
DRG 127 Heart failure and shock						
1996	56	8	3	30	1	1
2001	68	12	3	14	2	2
DRG 209 Hip replacement						
1996	19	17	19	22	22	0
2001	17	20	16	17	29	0
DRG 416 Septicemia						
1996	50	21	4	21	2	2
2001	51	27	4	10	3	5
DRG 475 Respiratory with ventilator support						
1996	42	18	6	26	6	2
2001	43	24	5	14	9	4
DRG 483 Tracheostomy with ventilator support						
1996	17	27	7	12	35	2
2001	19	27	4	7	41	2

Note: DRG (diagnosis related group), PAC (post-acute care), SNF (skilled nursing facility). Other post-acute providers include long-term care, rehabilitation, and psychiatric facilities. These data show use of post-acute care and hospice services by a 5 percent sample of beneficiaries enrolled in the traditional Medicare program. Totals may not add to 100 due to rounding.

Source: Direct Research LLC analysis of 1996 and 2001 claims from CMS.

for differences in patient case mix and did not have an outlier policy for especially costly cases.

Factors other than the payment system may also have affected the use of this benefit. Medicare’s coverage and eligibility policies for home health services have been modified since the mid-1990s. Medicare removed intravenous antibiotic administration and venipuncture as qualifying services for home care patients in September 1996 and

February 1998, respectively. The BBA more strictly defined “intermittent” to exclude more beneficiaries who required daily care.

In addition to these legislative changes, a number of compliance initiatives put in place by several federal agencies beginning in the mid-1990s may also have affected the use of home health services. Operation Restore Trust increased scrutiny of home health agencies, nursing homes, and durable medical equipment

suppliers and identified fraud and abuse. The Health Insurance Portability and Accountability Act of 1996 imposed civil monetary penalties on physicians who knowingly certified ineligible patients for Medicare home health as eligible. Furthermore, CMS implemented a six-month moratorium on certifying new home health agencies in September 1997.

Our findings suggest that since the implementation of the PPS, home health use has refocused from chronic

**TABLE
5-4**

Comparing predicted use of and spending for community-referral home health to actual levels, 2001

Percentile	Predicted, any use	Actual, any use	Ratio, actual to predicted
Of predicted use			
Total	6.3%	3.0%	0.48
50 th -60 th	4.5	1.5	0.34
60 th -70 th	6.6	2.1	0.32
70 th -80 th	9.2	3.6	0.39
80 th -90 th	13.8	6.2	0.45
90 th -100 th	25.2	13.7	0.54
Of predicted spending			
Total	\$274	\$108	0.39
50 th -60 th	204	57	0.28
60 th -70 th	292	67	0.23
70 th -80 th	415	115	0.28
80 th -90 th	621	216	0.35
90 th -100 th	1,207	527	0.44

Note: These data show use of and spending for postacute care services by a 5 percent sample of beneficiaries enrolled in the traditional Medicare program.

Source: Direct Research LLC analysis of 1996 and 2001 claims from CMS.

maintenance care to rehabilitation and recovery. Our study shows that the length of both posthospital and community-referral home health episodes declined by about 46 percent between 1996 and 2001. In addition, the smallest decline in posthospital home health use was for diagnoses with the strongest indicators for rehabilitation and recovery, such as hip, femur, and major joint and limb reattachment procedures. Conversely, the steepest decline in posthospital home health occurred for diagnoses such as heart failure and chronic obstructive pulmonary disease. These findings suggest that the reductions may be occurring disproportionately among beneficiaries whose needs are less well-defined, particularly those whose needs arise from the ill-defined general frailties of older age.

Our findings also suggest that for beneficiaries with certain clinical conditions, SNF use may be partly

replacing home health use. Consider the following changes in the use of SNF and home health following hospital discharge between 1996 and 2001:

- For septicemia discharges (DRG 416), home health use declined from 21 to 10 percent, while SNF use increased from 21 to 27 percent.
- For discharges with ventilator support (DRG 475), home health use declined from 26 to 14 percent, while SNF use increased from 18 to 24 percent.

Of concern to policymakers are the causes of this shift in care. The Commission has previously stated that if care shifts among settings, it should occur for clinical reasons and not because of different payment rates or the profitability of specific settings of care. Multivariate analyses are needed to examine the factors

influencing the choice of post-acute care setting for a given beneficiary and include information about:

- beneficiaries' demographic and clinical characteristics and functional status, and
- providers' characteristics, including profit status, size, staffing levels, market share, location (in terms of rural versus urban), and affiliation with a national or regional chain.

Comparing beneficiaries treated in long-term care hospitals and other settings

Long-term care hospitals provide intensive care to patients who have multiple comorbidities (coexisting conditions) and use inpatient hospital care for an extended period of time. Although beneficiaries can be admitted directly to an LTCH without being transferred from an acute hospital, about 80 percent of such Medicare patients are transfers. These facilities are the least frequently used post-acute care setting—fewer than 1 percent of beneficiaries discharged from acute hospitals use these facilities.

Since implementing the acute hospital PPS in 1983, hospitals have had strong financial incentives to transfer patients to post-acute care settings. Acute hospitals can benefit from per-discharge payments, based on averages, that are greater than their costs for caring for patients. The earlier in the course of illness that hospitals can discharge patients, the greater the benefit. Since LTCHs provide a hospital level of care, they are able to admit patients earlier in their illnesses.

All post-acute care settings experienced rapid market entry and growth in volume and spending during the 1990s, but long-term care hospitals' growth was the most rapid. For example, the number of LTCHs more than doubled (from 105 to 287) from 1993 to 2003. Medicare spending for care

furnished in these facilities almost quintupled from \$398 million in 1993 to an estimated \$1.9 billion in 2001. Further, CMS estimates that spending for such facilities will reach nearly \$2.7 billion by 2008.

Geographically, LTCHs are unevenly distributed (Figure 5-2). For example, Louisiana, Massachusetts, and Texas together have more than 35 percent of LTCHs, but only 10 percent of Medicare beneficiaries. The oldest and newest LTCHs are concentrated in the Northeast and the South, respectively.

MedPAC has questioned the role LTCHs play in providing acute and post-acute care and the relationship of beneficiaries' outcomes and the high cost of care in this post-acute setting (MedPAC 2002a). More information is needed on a number of issues regarding LTCHs, including the following:

- To what extent do patients treated in LTCHs and in other settings differ?
- How do payments and outcomes compare for similar patients cared for in and outside long-term care hospitals?
- What kinds of relationships do LTCHs have with acute hospitals?

The uneven geographic distribution motivates our comparisons of patients who use and do not use long-term care hospitals and our examination of differences among LTCHs and the acute hospitals that refer to them. We began the study with the purpose of testing the following hypotheses:

- First, we expected clinically similar Medicare beneficiaries not treated in LTCHs to remain in acute hospitals for a longer period of time and to use SNF care following the hospital stay.
- Second, we expected total Medicare spending to be higher for patients who used LTCHs compared with spending for similar patients.

- Third, we expected long-term care hospitals to provide a more complex mix of services reflected in patients with higher severity of illness and higher payments. We also expected LTCH users to have fewer readmissions to the acute hospital because both types of hospitals provide an acute level of care.
- Fourth, we expected acute hospitals with LTCHs located within them to have a stronger relationship with the LTCHs—referring a larger share of patients—compared with other hospitals that are primary referrers.
- Compared with patients who did not use LTCHs, readmission rates for patients who used LTCHs were mixed for lower severity levels and were lower for patients with higher severity levels.
- All LTCHs have a strong relationship with—receive a large share of patients from—one acute hospital.

All of the findings about LTCHs discussed in this chapter are based on descriptive statistics. More research is needed to examine these issues while controlling for patient characteristics and discharge destination. We discuss the next steps in studying LTCHs in the last section of this chapter. The methods used in our study are discussed in the text box on page 82.

Background

Hospitals seeking certification as long-term care hospitals must meet all the same conditions of participation as acute hospitals and, in addition, demonstrate that their Medicare average length of stay is greater than 25 days. However, there are no qualifying criteria for patients admitted to LTCHs. Beginning in October 2002, Medicare began paying LTCHs under a per-discharge prospective payment system, implemented by cost-reporting period.⁷

Analysts generally have perceived LTCHs as a diverse group of facilities whose only common feature was an average length of stay of at least 25 days (ProPAC 1992). More recent research found that most LTCHs specialize in treating a narrow range of medical conditions—either respiratory care, rehabilitation care, or a combination of the two (Liu et al. 2001).

Liu and associates (2001) also found that they could characterize long-term care hospitals by their date of certification. They found trends in location, facility size, type of LTCH, and ownership. Those certified before October 1983, when Medicare implemented the acute hospital

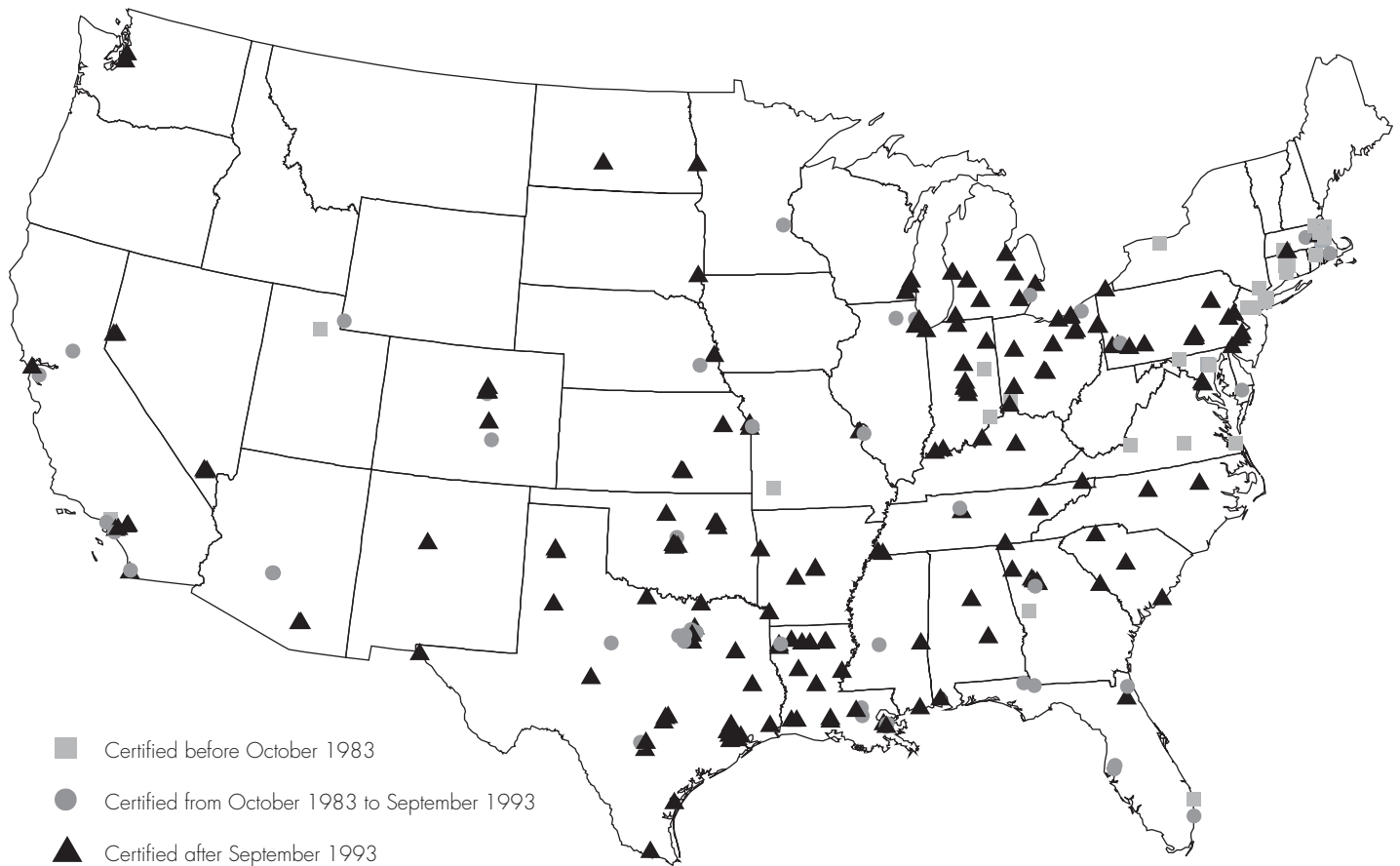
This section of the chapter describes the approach we took to testing these hypotheses and our results. We first compared patients with the same DRG and severity level across markets with and without LTCHs. We then compared patients who used and did not use LTCHs (by DRG and severity level) within markets with LTCHs. Finally, we compared LTCH users with post-acute care users in markets without LTCHs by DRG and severity level. Our analysis provides several major findings, both within and across markets:

- Patients who did and did not use LTCHs had similar lengths of stay in acute hospitals.
- Patients with the same DRG and severity level appear to use SNFs to substitute for LTCH care.
- Total Medicare payments (pre-LTCH PPS) for episodes for most patients who used LTCHs were 140 to 260 percent of payments for patients in the same DRG and severity level who did not use LTCHs.
- The death rate in 2001 for patients who used LTCHs was higher than for similar patients, although this phenomenon may be an indication of unmeasured differences in case mix.

⁷ The design of the PPS is discussed in detail in Appendix A of the March 2003 MedPAC Report to the Congress.

**FIGURE
5-2**

Location of long-term care hospitals, 2002



Source: Online Survey, Certification, and Reporting System from CMS.

PPS, shown on the map in Figure 5-2 by gray squares, are located mainly in the Northeast. Usually big hospitals with more than 100 beds, these older LTCHs generally are freestanding. They are predominately government-owned or nonprofit (none are for profit) and, compared with newer ones, admit the largest shares of Medicaid patients and private pay patients (26 percent each). Less than one-half of their cases are paid for by Medicare.

LTCHs certified from October 1983 through September 1993 are shown on the map by gray dots. About one-half of these are located in the South and most have between 25 and 99 beds (Liu et al. 2001). Most LTCHs in this group are

freestanding and almost one-half of them are for profit. About 70 percent of their cases are paid for by Medicare and about 8 percent are paid for by Medicaid. About 20 LTCHs certified during this period are members of a large national for-profit chain.

Long-term care hospitals certified after September 1993, shown on the map by black triangles, are mainly located in the South (Liu et al. 2001). They are generally for profit, small (with fewer than 50 beds), and many are within hospitals. Eighty percent of their cases are paid for by Medicare and 4 percent are paid for by Medicaid. Many of the LTCHs certified after September 1993 belong to one of two national for-profit chains.

Comparing patients with and without access to long-term care hospitals

We began the study by examining patients' characteristics and use of care in market areas with and without long-term care hospitals. About 61 percent of 2.9 million acute hospital patients with 11 common LTCH diagnoses live in market areas that have 1 or more such facility. Patients who live in market areas with and without them are almost identical in demographic characteristics, clinical characteristics, and use of care (Table 5-5, p. 83). The only difference in demographic characteristics for patients in the two areas is that patients in areas without LTCHs are more likely to be white.

Methods for long-term care hospital study

We selected acute hospital discharges in 2001 using the 11 diagnosis related groups (DRGs) that accounted for 2 percent or more of all long-term care hospital (LTCH) cases (see below). Together, these 11 DRGs accounted for almost 40 percent of LTCH discharges in 2001.

We used 2001 MEDPAR data to identify discharges from the acute hospital, and matched these stays to LTCH discharges, skilled nursing facility (SNF) stays, and home health claims. We also used the latest available cost report data for acute hospitals—either 2000 or 1999.

A patient's discharge DRG from the acute hospital assigned the individual to a clinical group.

We used location of LTCHs and the Dartmouth Atlas hospital referral regions (HRRs) to assign these patients

to two groups¹: patients who live in a market area with access to an LTCH and patients who live in a market area without an LTCH.

If an LTCH is located in an HRR, we assume that all patients living there have access to an LTCH. We excluded 10 percent of patients with the DRGs of interest who traveled outside their HRR to use an LTCH.

We used all patient refined DRGs (APR-DRGs) and diagnoses from the acute hospital stay to assign a severity of illness score for each patient (3M 1998). APR-DRGs use patient age, combinations and interactions of diagnoses to determine severity of illness (the extent of physiological decompensation or organ system loss of function experienced by the patient). Severity level ranges from 1 to 4, with 4 the most severe.

An episode is all care in acute hospitals, in LTCHs, in SNFs, and from home health agencies. We did not include inpatient rehabilitation facilities (IRFs) because the conditions of participation for these facilities are so stringent and different from the conditions of participation for LTCHs. IRFs must have medical directors and nurses who specialize in physical medicine and rehabilitation; have 75 percent of admissions from 10 specific diagnoses; and can only admit patients who can sustain 3 hours of therapy a day and have the potential to meet predetermined goals. The only restriction for LTCHs is that patients must require medically necessary hospital-level services. Due to the more stringent requirements for IRFs, it is unlikely that they can substitute for LTCHs, although the reverse could happen.

Episodes ended if an individual was readmitted to the acute hospital, died, or had no additional Medicare acute or post-acute services for 61 days. To make Medicare payments equivalent for all areas, we removed the effect of local area wage differences from all payments. For total episode payments we summed the standardized amounts for acute and post-acute care.

We used deaths in 2001 regardless of where they occurred.

To answer research questions about long-term care hospitals within hospitals, we divided LTCHs into two groups: LTCHs located within hospitals as identified by individuals familiar with the industry, and all other LTCHs. ■

Eleven DRGs for patients frequently transferred to long-term care hospitals

DRG	Description of DRG	Distribution in acute hospitals	Distribution in LTCHs
127	Heart failure and shock	6%	6%
089	Simple pneumonia	4	4
088	COPD	4	4
014	Stroke with infarction	3	4
416	Septicemia	2	3
079	Respiratory infections and inflammation	2	3
475	Respiratory with ventilator support	1	3
483	Tracheostomy with ventilator support	< 1	3
209	Hip replacement	3	2
296	Nutritional and miscellaneous metabolic disorders	2	2
320	Kidney and urinary tract infections	2	2

Note: COPD (chronic obstructive pulmonary disease), DRG (diagnosis related group), LTCH (long-term care hospital).

Source: MedPAC analysis of 2001 MEDPAR from CMS; Federal Register 2000.

¹ The Dartmouth Atlas defines 306 HRRs that represent health care markets for tertiary medical care (Wennberg et al. 1999). HRRs are mutually exclusive regions that are geographically contiguous and have a minimum population of 120,000. A high percentage of hospitalizations of individuals living in the region must have occurred in one or more hospitals located within the HRR. Each HRR contains at least one hospital service area with a hospital or hospitals that performed major cardiovascular procedures or neurosurgery in 1992 to 1993.

Patients in market areas with and without LTCHs are also extremely similar in clinical characteristics, except that patients in areas with LTCHs are slightly more likely to have been treated in an intensive care unit and to have died in 2001. The average hospital length of stay (LOS) and total episode LOS are identical for patients in areas with and without LTCHs. Average Medicare payments for the acute hospital and the episode were roughly similar—with only a 3 percent difference in average payments for acute hospitals and less than 5 percent difference in payments for the episode.

We next examined the patient population in market areas with and without long-term care hospitals to determine whether there were differences in severity of illness. We found the distribution of cases across the 11 DRGs to be identical for the 2 types of market areas. When we compared the severity of illness by each of the 11 diagnoses in areas with and without LTCHs, we found that the distribution of severity was almost identical (Table 5-6, p. 84).⁸ (The 5 DRGs shown in Tables 5-6 through 5-8 account for almost one-half of the patients in the 11 DRGs we studied.) Five of 11 DRGs have identical distributions across the 4 levels of severity, 4 DRGs have a 1 percentage point difference, and the remaining 2 DRGs have a total difference of 2 percentage points. Thus, based on acute and post-acute care use and hospital diagnoses, we see no systematic differences in patients in areas with and without LTCHs.

Comparing patients in LTCH market areas

We next examined the distribution of severity levels for patients using LTCHs and other post-acute settings in market areas with these hospitals. For the 11 DRGs, we found that about 33 and 35 percent of the patients using LTCHs, respectively, have severity levels 3 and 4. Patients with severity levels 1 and 2 make

TABLE 5-5

Comparison of patient characteristics by market areas, 2001

Characteristic	Market areas with LTCHs	Market areas without LTCHs
Patients	1.8 million 61%	1.1 million 39%
Average age (years)	77	77
Female	60%	59%
White	82%	89%
Disabled	10%	9%
Major risk of death	30%	30%
Extreme risk of death	9%	9%
Died in 2001	27%	26%
Intensive care unit use	21%	19%
Readmission after post-acute care	10%	10%
High-cost outlier in acute hospital	2%	2%
Used long-term care hospital	1%	0%
Used skilled nursing facility	22%	23%
Used home health care	17%	17%
Used postacute care	35%	35%
Acute hospital ALOS (days)	6	6
Total episode ALOS (days)	21	21
Average acute hospital payment	\$7,667	\$7,401
Average total episode payment	\$12,117	\$11,528

Note: ALOS (average length of stay), LTCH (long-term care hospital).

Source: MedPAC analysis of 2001 MEDPAR data from CMS.

up the remaining 32 percent of LTCH patients. In contrast, among patients who did not use LTCHs, about 55 percent had severity level 1 and 2 and the remaining 45 percent had severity level 3 and 4.

We hypothesized that clinically similar patients using long-term care hospitals would have shorter stays in the acute hospital and use SNFs less frequently than patients who did not use LTCHs. That expectation in the case of acute hospital use is not supported by the data but is supported for SNF use. For 37 out of 44 diagnosis related group and severity level combinations (11 DRGs each with 4

severity levels), LTCH patients had slightly longer acute hospital LOSs compared with patients with the same DRG-severity level who did not use LTCHs. However, these differences were not large—in 35 categories the difference in LOS was less than 1 day.

The data suggest that skilled nursing facilities and long-term care hospitals may be substitutes. As noted, patients who did and did not use these hospitals had similar LOSs in the acute hospital. At the same time, patients who used LTCHs were three to five times less likely to use SNFs than patients who did not use long-term

⁸ We use 5 of the 11 DRGs studied to illustrate similarities and differences among different groups—those with or without access to long-term care hospitals or those treated in LTCHs and other settings. We chose these five diagnosis related groups because DRG 127 is the most numerous in both acute hospitals and LTCHs, DRG 014 and 209 both frequently require rehabilitation care, and DRG 475 and 483 both require ventilator support.

**TABLE
5-6**

Patients in five DRGs by selected levels of severity of illness, in market areas with and without LTCHs, 2001

DRG	Market areas with LTCHs		Market areas without LTCHs	
	Severity level		Severity level	
	1	4	1	4
014 Stroke with infarction	10%	10%	9%	9%
127 Heart failure and shock	9	3	9	3
209 Hip replacement	33	1	34	1
475 Respiratory with ventilator support	0	71	0	69
483 Tracheostomy with ventilator support	0	86	0	86

Note: DRG (diagnosis related group), LTCH (long-term care hospital). Severity level 1 is lowest, 4 is highest. These five DRGs account for almost one-fifth of all patients transferred to LTCHs.

Source: MedPAC analysis of 2001 MEDPAR data from CMS.

care hospitals. For patients in severity level 4 who did not use LTCHs, across the 11 diagnosis related groups, 61 to 90 percent used SNFs.

As expected, we found long-term care hospital care to be more expensive than care in other post-acute settings. In the LTCH market areas, we generally found that total episode payments (for acute and post-acute care) were much higher for long-term care hospital users. Total payments for patients in the five illustrative diagnosis related group-severity levels who used LTCHs were between 140 and 260 percent higher than for those not using LTCHs (Table 5-7). We found the same pattern in the six DRGs not shown. DRG 483 (tracheostomy with mechanical ventilation), discussed below, was the only exception.

It is important to note that the much higher episode payments for LTCH users are not obvious in Table 5-5 (p. 83)

because the small number of those users are overwhelmed by the much larger number of patients not using them. Thus, we compared patients by DRG and severity level within LTCH markets to get a more accurate picture.

Death rates generally increase with severity of illness for patients who used and did not use LTCHs in the same market areas. However, patients who used LTCHs were more likely to die in 2001—in 41 out of 44 groups—compared with patients who did not use LTCHs (Table 5-8, p. 86). We find that death rates are generally higher among LTCH patients for all levels of severity. In all but DRG 209 (hip replacement), more than 45 percent of patients in severity level 4 who used LTCHs died in 2001, and in two DRGs more than 60 percent died.⁹ We found the same pattern in the six DRGs not shown. Higher death rates may reflect unmeasured severity of illness or may reflect that LTCHs provide end-of-life care.

We also compared rates of readmission to the acute hospital for patients who used and did not use long-term care hospitals. We found mixed readmission rates. Compared with patients who did not use LTCHs, readmission rates for patients who used them were mixed for those with lower severity levels and were lower for patients with higher severity levels. Readmission rates for the six DRGs not shown follow the same pattern.

DRG 483 (tracheostomy with mechanical ventilator) is unique in several ways. It was the only diagnosis related group in which patients in all four severity levels had a difference in acute hospital LOS of more than one day. Patients with severity levels 3 and 4 who used LTCHs had shorter hospital LOSs than patients who did not. It is also the only DRG where total payments in 2001 were very similar for patients with this group and severity level 4 for patients who did and did not use LTCHs—patients who used LTCHs had a 2 percent higher total payment. However, this similarity will disappear under the LTCH PPS—the rate for DRG 483 starting July 1, 2003 will be \$116,000, more than the total episode payment for patients in this group in 2001 (CMS 2003).

Comparing patients using LTCHs with similar patients in market areas without LTCHs

Many areas of the country have no LTCHs. A key question therefore, is where are patients similar to long-term care hospital patients treated in market areas without those facilities? To answer the question we compared LTCH patients with post-acute care users in market areas without LTCHs. The comparison is somewhat limited, because under 4 percent of post-acute users go to LTCHs even in areas with LTCHs. Therefore, overall differences and similarities will be small between areas with and without LTCHs.

We found results similar to our other comparison.

⁹ Deaths in 2001 represent all deaths regardless of where death occurred.

- Distribution by severity level was almost identical for post-acute users in areas with and without LTCHs (Figure 5-3, p. 86).
- Acute hospitals do not appear to substitute for LTCHs. Compared with post-acute users in market areas without LTCHs, the acute hospital LOS was slightly longer for LTCH patients (in 31 out of 44 DRG-severity level comparisons). If they were substitutes, acute hospital LOSs would be shorter by more than one day for LTCH patients. In the 13 categories where post-acute users in markets without LTCHs had a longer LOS than LTCH users, the difference was less than 1 day in 9 categories.
- SNFs may substitute for LTCHs. When we compared skilled nursing facility and long-term care hospital users in market areas with LTCHs by severity level with SNF users in market areas without LTCHs, we found that similar proportions of patients used one of the two settings (Figure 5-3, p. 86).
- Total payments for LTCH users were 140 to 260 percent of payments for post-acute users in market areas without LTCHs (in 42 out of 44 DRG-severity levels). Death rates were higher for LTCH users compared with post-acute users in markets without LTCHs; this phenomenon may reflect unmeasured severity of illness. Readmission rates were mixed—LTCH users with higher severity levels had a lower readmission rate compared with similar patients in market areas without LTCHs, but there was no consistent pattern in readmission rates for lower severity patients.

TABLE 5-7

Total payments for patients who used post-acute care, by use of LTCHs, in market areas with LTCHs, 2001

DRG	Mean total payment, 2001 (pre-PPS)	
	Severity Level	
	2	4
014 Stroke with infarction		
LTCH use	\$ 31,164	\$ 36,053
No LTCH use	15,191	21,161
127 Heart failure and shock		
LTCH use	26,720	27,687
No LTCH use	12,451	14,773
209 Hip replacement		
LTCH use	30,776	37,357
No LTCH use	16,813	22,191
475 Respiratory with ventilator support		
LTCH use	41,309	47,527
No LTCH use	19,145	32,991
483 Tracheostomy with ventilator support		
LTCH use	85,533	112,177
No LTCH use	68,423	110,043

Note: DRG (diagnosis related group), LTCH (long-term care hospital), PPS (prospective payment system). Severity level 1 is lowest, 4 is highest. Total payment adjusted for the effect of local area wages for acute hospital, long-term care hospital, skilled nursing facility, and home health care.

Source: MedPAC analysis of 2001 MEDPAR data from CMS.

LTCHs' relationships with acute hospitals

In addition to their concern about rapid growth in long-term care hospitals in general, CMS and other policymakers have expressed particular concern about the even more rapid growth in LTCHs within hospitals. CMS (2002) has suggested that these facilities may increase the host hospitals' ability to manipulate the inpatient PPS by shortening the length of stay and profiting from the DRG payment.¹⁰ Hospitals may transfer patients who could have remained in the acute care hospital under the original DRG payment to LTCHs within

hospitals, thus increasing Medicare's costs by generating two discharges. The rapid growth in these types of LTCHs—from 10 to 114 LTCHs between 1993 and 2002, an average annual increase of about 30 percent—has heightened concern.

We found that a long-term care hospital generally has a strong relationship with one acute care hospital regardless of where it is located. LTCHs within hospitals received 61 percent of cases from their most frequent referrer. Those not located within a hospital received 42 percent of cases from their most frequent referrer.

10 To protect Medicare from this kind of manipulation, CMS developed regulations that try to keep LTCHs within hospitals distinct from the hospital. LTCHs within hospitals are required to have a separate governing body, chief financial officer, chief medical officer, and medical staff. In addition, they must meet one of the following three criteria: (1) perform basic functions independently from the host hospitals, (2) incur no more than 15 percent of total inpatient operating costs for items and services supplied by the host hospital, or (3) have an inpatient load of which at least 75 percent of patients are admitted from sources other than the host hospital. LTCHs within hospitals exempted from the acute care hospital PPS before October 1995 are exempt from these rules.

TABLE 5-8

Death rates and rates of readmission for patients who used post-acute care, in market areas with LTCHs, 2001

DRG	Rates of death by severity level		Rates of readmission by severity level	
	2	4	2	4
014 Stroke with infarction				
LTCH use	28.2%	47.2%	25.4%	31.8%
No LTCH use	16.7	46.7	23.0	37.5
127 Heart failure and shock				
LTCH use	38.2	63.1	35.9	32.5
No LTCH use	27.7	44.6	38.2	42.6
209 Hip replacement				
LTCH use	8.2	34.4	18.9	20.3
No LTCH use	0.0	0.2	13.1	32.4
475 Respiratory with ventilator support				
LTCH use	17.9	54.0	28.6	32.8
No LTCH use	25.3	38.0	32.3	39.8
483 Tracheostomy with ventilator support				
LTCH use	36.7	81.7	30.6	33.0
No LTCH use	29.3	42.0	36.8	44.5

Note: DRG (diagnosis related group), LTCH (long-term care hospital). Severity level 1 is lowest, 4 is highest.

Source: MedPAC analysis of 2001 MEDPAR data from CMS.

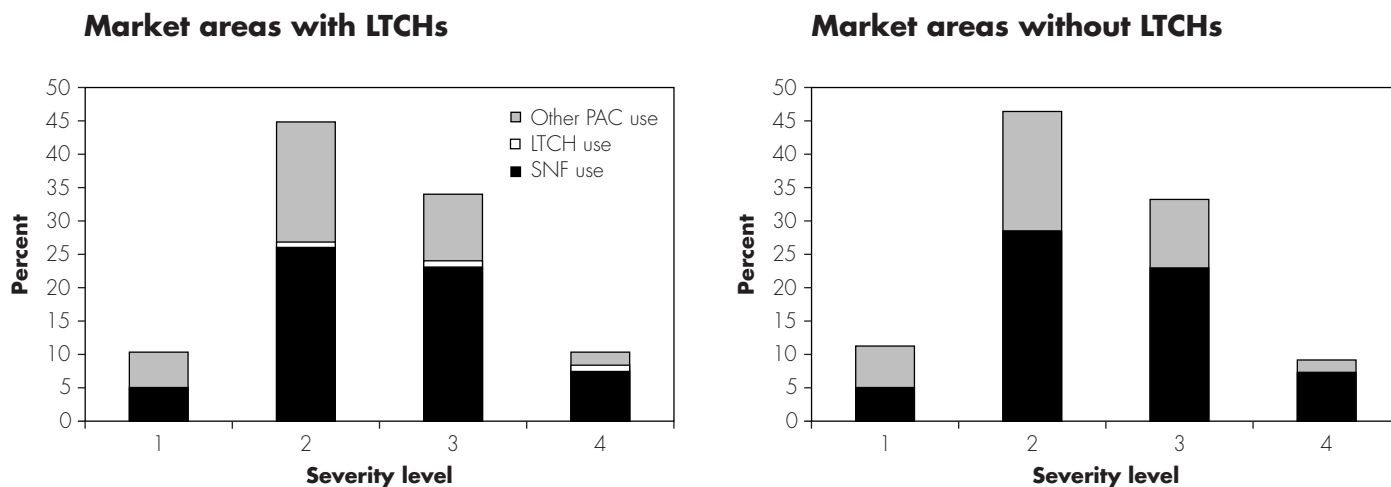
To determine what types of acute hospitals have relationships with long-term care hospitals, we compared the most frequent referrers to LTCHs with general hospitals. The most frequent referrers are more likely than the nation's general hospitals to be located in urban areas and are two and one-half times more likely to be teaching hospitals (Table 5-9). They also are much more likely to receive disproportionate share payments.

Interestingly, when we compared long-term care hospitals within acute hospitals with those not located within acute hospitals, we found that the LTCHs within hospitals had a somewhat higher proportion of acute hospital transfers that were classified as high-cost outlier cases. This is contrary to our expectation that LTCHs within hospitals would have a lower proportion of cases classified as high-cost outliers in the acute hospital. We also found no difference among LTCHs within hospitals and others in the proportion of patients readmitted to the acute hospital.

For an acute care hospital, the benefits of a strong relationship with a long-term care hospital are clear—an acute hospital can transfer its most costly patients to the

FIGURE 5-3

Patients' use of post-acute care, by severity level, in market areas with and without LTCHs, 2001



Note: LTCH (long-term care hospital), PAC (post-acute care), SNF (skilled nursing facility). Severity level 1 is lowest, 4 is highest. Percentages may not add to 100 due to rounding. Severity level is determined during the inpatient hospital stay. Distribution is among patients in the 11 DRGs with greatest use of LTCHs.

Source: MedPAC analysis of 2001 MEDPAR data from CMS.

**TABLE
5-9**

Characteristics of primary referrers to long-term care hospitals and nation's general hospitals, 2000

	Primary referrers to LTCHs	Nation's general hospitals
Urban location	> 90%	60%
Voluntary	70	61
Proprietary	16	16
Payment for teaching and DSH	47	16
Payment for teaching only	13	8
Payment for DSH only	22	24
Medicare inpatient margin, 2000	27	11
Adjusted Medicare inpatient margin, 2000	5	2

Note: DSH (disproportionate share) of low-income patients, LTCH (long-term care hospital). Adjusted margin has payments for indirect medical education above 2.7 percent and DSH removed.

Source: MedPAC analysis of cost reports from CMS.

LTCH and thus save money. It was beyond the scope of this part of our research to look at changes in LOS. But we did find some evidence that transfers of most costly patients may take place when we examined margins for the acute hospitals that were the primary referrers to LTCHs and found that the aggregate Medicare inpatient margin was 27 percent for fiscal year 2000. This margin

compares with an 11 percent aggregate inpatient margin for all hospitals in fiscal year 2000. When we adjust margins by removing indirect medical education above the empirical level (above 2.7 percent) and disproportionate share of low-income patients, the Medicare inpatient margin was 5 and 2 percent for primary referrers and all hospitals, respectively. The benefits of a strong

relationship for LTCHs include a steady stream of patients and the ability to choose which patients to admit.

Further research

The geographically skewed distribution of long-term care hospitals, their apparent substitution for skilled nursing facilities, the substantial proportion of admissions with lower severity of illness, and LTCHs representing higher costs to Medicare but with mixed outcomes all mean that more research is needed to determine the role that LTCHs play for Medicare patients and to understand quality outcomes in this setting. Therefore, we plan to:

- model total payments for LTCH patients under the PPS;
- compare quality and cost, controlling for patient characteristics (particularly severity of illness) and discharge destination (including age of the institution);
- determine whether other provider types are being converted to LTCHs; and
- examine financial performance for LTCHs and LTCHs within hospitals. ■

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