

CHAPTER

5

Defining long-term care hospitals

R E C O M M E N D A T I O N S

5A The Congress and the Secretary should define long-term care hospitals by facility and patient criteria that ensure that patients admitted to these facilities are medically complex and have a good chance of improvement.

- Facility-level criteria should characterize this level of care by features such as staffing, patient evaluation and review processes, and mix of patients.
- Patient-level criteria should identify specific clinical characteristics and treatment modalities.

COMMISSIONER VOTES: YES 16 • NO 0 • NOT VOTING 0 • ABSENT 1

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5B The Secretary should require the Quality Improvement Organizations to review long-term care hospital admissions for medical necessity and monitor that these facilities are in compliance with defining criteria.

COMMISSIONER VOTES: YES 16 • NO 0 • NOT VOTING 0 • ABSENT 1

Defining long-term care hospitals

Rapid growth in the number of long-term care hospitals (LTCHs) and in Medicare's spending highlights the need for more information about these facilities and the care beneficiaries receive in them. Using qualitative and quantitative methods, we find that LTCHs' role is to provide post-acute care to a small number of medically complex patients. We also find that the supply of LTCHs is a strong predictor of their use and that acute hospitals and skilled nursing facilities are the principal alternatives to LTCHs. We find that, in general, LTCH patients cost Medicare more than similar patients using alternative settings but that if LTCH care is targeted to patients of the highest severity, the cost is comparable. We conclude that continued growth in LTCHs and the financial incentives presented by multiple Medicare prospective payment systems make a new, clearer definition of LTCH care imperative. Thus, the Commission recommends that long-term care hospitals be defined by facility and patient criteria that ensure that patients admitted to these facilities are medically complex and have a good chance of improvement.

In this chapter

- What are long-term care hospitals and how does Medicare pay them?

- How did we study long-term care hospitals?

- What role do long-term care hospitals play in providing care?

- Where are clinically similar patients treated in areas without long-term care hospitals?

- How do Medicare payments and outcomes compare for LTCH patients versus those in other settings?

- What criteria can we use to better define LTCHs and the patients most appropriate for this type of care?

- Technical methodology section

Prior to this study, little was known about long-term care hospitals (LTCHs), a category of Medicare providers exempted from the prospective payment system (PPS) for acute hospitals in 1983. The rapid growth in the number of LTCHs and the corresponding increase in Medicare spending, combined with the concentration of these facilities in some parts of the nation and the lack of them in other parts have raised a number of questions, such as:

- What role do long-term care hospitals play in providing care?
- Where are clinically similar patients treated in areas without long-term care hospitals?
- How do Medicare payments and outcomes compare for LTCH patients versus those in other settings?

For MedPAC's June 2003 report to the Congress, we studied patients with the 11 most common diagnoses in long-term care hospitals, using descriptive analysis and controlling for diagnosis related group (DRG) and severity of illness (MedPAC 2003). We found that patients in market areas with LTCHs had similar acute hospital lengths of stay whether they used these facilities or not. Patients who used LTCHs were three to five times less likely to use skilled nursing facility (SNF) care, suggesting that SNFs and long-term care hospitals may be substitutes. We also found that Medicare pays more for patients treated in LTCHs, compared with similar patients not treated in them. We concluded that more research was needed to answer the three questions above.

In this chapter, we report the results of our subsequent research, both qualitative and quantitative, designed to answer the questions about LTCHs. We then turn to the question of what criteria Medicare can use to better define long-term care hospitals and the patients most appropriate for treatment in them.

What are long-term care hospitals and how does Medicare pay them?

To qualify as long-term care hospitals for Medicare payment, facilities must meet the conditions of participation for acute hospitals. Currently, the only other requirement is that LTCHs must have an average Medicare length of stay (LOS) greater than 25 days.

The number of LTCHs has grown rapidly from 105 facilities in 1993 to 318 in 2003, or 12 percent annually. Recently, the pace of growth has doubled—22 new LTCHs were certified by Medicare in the first six months of fiscal year 2004 compared with the same number of facilities in all of fiscal year 2003.

Medicare spending for LTCHs has grown even more rapidly than the number of LTCHs, at 15 percent per year. Spending has almost quintupled from \$398 million in 1993 to \$1.9 billion in 2001. CMS estimates that Medicare spending for LTCHs will be \$2.8 billion in 2004. This estimate, however, does not take into consideration the growth in LTCHs since 2001 and the consequent increases in LTCH cases. For example, the number of LTCH cases increased by 24 percent from 2001 to 2002.

Medicare is the predominant payer for long-term hospital care, particularly for newer LTCHs. In 1997, Medicare paid for 71 percent of LTCHs' discharges (Liu et al. 2001). For long-term care hospitals established after September 1993, Medicare paid for 80 percent of discharges.

In fiscal year 2003, the method of payment for LTCHs changed from a cost-based system to a prospective payment system. Under the old cost-based system, LTCHs had incentives to keep their total costs slightly below their facility-specific payment limit (established in their base year and updated annually) in order to qualify for limited bonuses. Payments were not adjusted for changes in the mix of patients over time. Under the PPS, Medicare pays LTCHs predetermined per discharge rates based primarily on patients' principal diagnoses. Each discharge is assigned to one of 518 case-mix categories, and each case-mix category has its own payment rate that reflects the expected costs of treatment. While the payment system now accounts for case-mix differences, it does not account for differences in the severity of patients within each case-mix category. As a result, similar to other PPSs, LTCHs have an incentive to admit patients with the least need for resources among those with the same diagnosis.

Long-term care hospitals are usually the most costly post-acute care setting. In fiscal year 2004, for patients with the most common LTCH diagnoses, Medicare rates for LTCHs range from 0.9 to 4.4 times as much as estimated rates for inpatient rehabilitation facilities (IRFs), and about 3 to almost 12 times as much as estimated rates for SNFs (Table 5-1).

**TABLE
5-1**

Payments usually are higher for long-term care hospitals than for other post-acute settings, fiscal year 2004

Per case payment for post-acute setting

Principal diagnosis	Long-term care hospital	Inpatient rehabilitation facility*	Skilled nursing facility**
Tracheostomy with ventilator 96+ hours	\$115,463	\$ 26,051	\$ 10,051
Respiratory system with ventilator	74,689	26,051	7,897
Major joint and limb replacement, lower extremity	67,104	17,135	6,165
Skin graft and wound debridement	48,595	N/A	8,111
Amputation	44,983	33,245	9,590
Hip fracture	44,633	18,487	10,618
Stroke	31,496	34,196	8,905
Skin ulcers	34,704	N/A	8,111
Septicemia	34,340	N/A	8,974
Osteomyelitis	29,563	N/A	10,410

Notes: N/A (not applicable).

*For inpatient rehabilitation facilities, payments are for the case-mix group with the lowest functional status and the most comorbidities. This seemed to be the most conservative comparison to LTCHs.

** For skilled nursing facilities (SNF), payments are estimated based on the actual average length of stay by diagnosis (for the first SNF admission after hospital discharge) times the per diem rate for the case-mix group to which patients with that diagnosis are most likely to be assigned.

Source: Federal Registers 2003a, 2003c, 2003e; MedPAC analysis of 2001 claims from CMS.

LTCHs are unevenly distributed across the country (Figure 5-1, p. 124). Some areas have many LTCHs; other areas have none. Using multivariate regression analysis, we determined that presence of an LTCH in a market area is not related to the proportion of sickest patients. The uneven distribution and lack of a clinical relationship to LTCH location raises two questions: First, what role do LTCHs play if they are present in some areas and not others? Second, where are clinically similar patients treated in areas without any of these facilities?

How did we study long-term care hospitals?

We used both qualitative and quantitative approaches to answer our key questions regarding the role that LTCHs play, where patients in areas without LTCHs are treated, and the differences in Medicare payments and outcomes for patients who use LTCHs compared with those treated in other settings. We used:

- Structured interviews with 34 physicians, hospital administrators, nurses, and discharge planners to

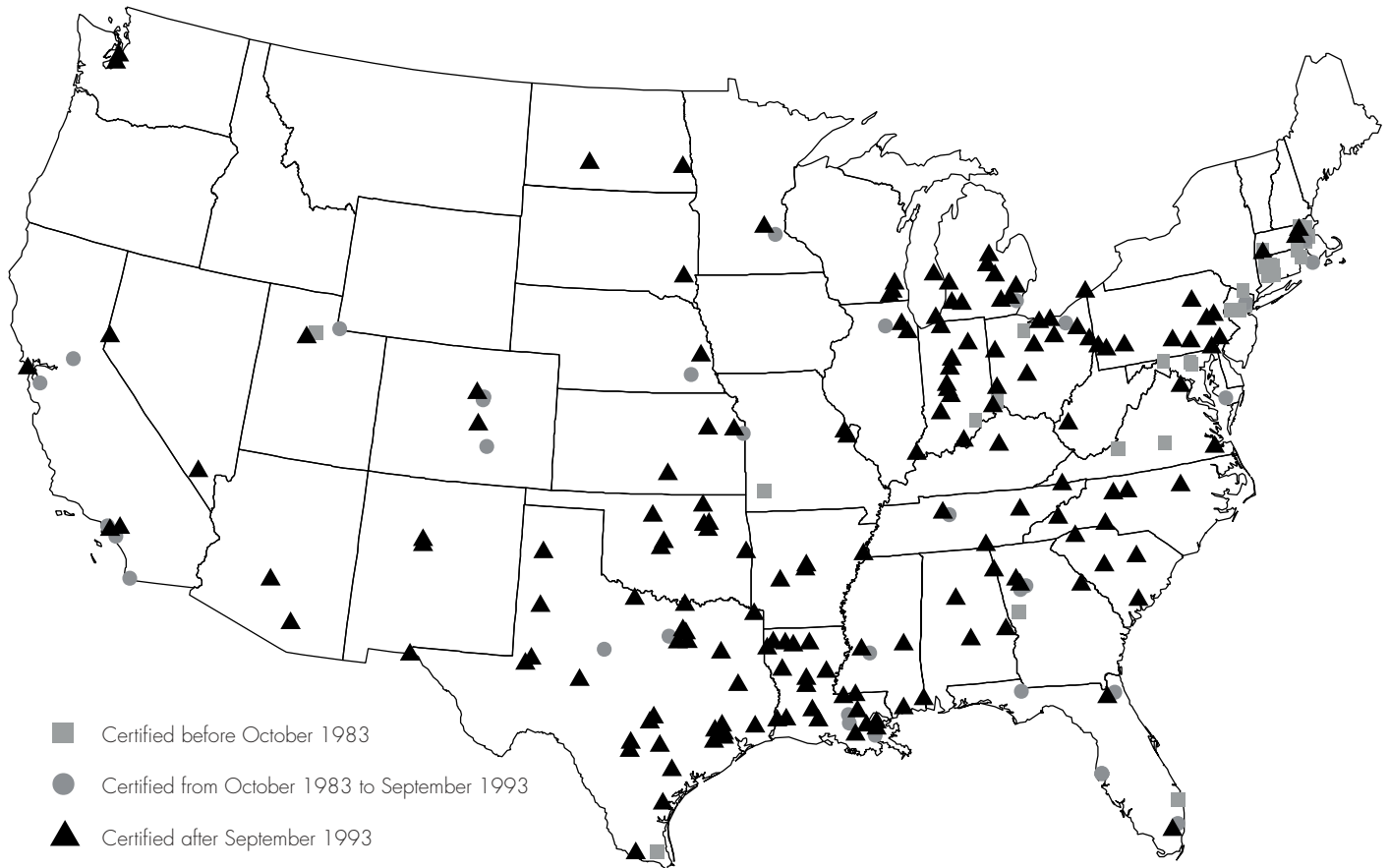
understand how LTCH-type patients are treated in markets with and without LTCHs. Researchers from NORC and Georgetown University conducted these interviews in four markets (two with and two without LTCHs).

- Site visits to LTCHs in three cities. Physicians from 10 LTCHs presented clinical cases of patients treated in their facilities to MedPAC staff, Commissioners, and a physician consultant.
- Quantitative analyses that included both market-level analyses to compare characteristics of patients treated in markets with and without LTCHs, and patient-level analyses to examine the impact of LTCH use on Medicare spending and outcomes.

The unit of analysis for the quantitative research is the beneficiary’s episode of care. Episodes begin with admission to the acute hospital and end with either readmission to the acute hospital, 61 days without Medicare acute or post-acute care services (Medicare’s definition of a spell of illness), or death.

**FIGURE
5-1**

Location of long-term care hospitals, 2003



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

In addition to the full data set with 4.3 million episodes that we used for most of our analyses, we also created two subsamples of episodes for patients most likely to use LTCHs to see whether the coefficients of interest differ for the types of patients who are frequently admitted to these facilities.

- The first subsample (226,000 episodes) includes patients who had a high probability (the top 5 percent) of using an LTCH based on their clinical characteristics. Although these patients have the highest probability of using an LTCH, their likelihood of using an LTCH is still relatively small.
- Our second subsample (20,000 episodes) consists of patients with an acute hospital diagnosis of tracheostomy with at least 96 hours of ventilator

support. In this chapter we refer to these individuals as tracheostomy patients. This group is the most strongly associated with using LTCHs.

We used the full sample and two subsamples to evaluate how LTCH use affects the following dependent variables:

- acute hospital length of stay,
- discharge destination following acute hospital stay,
- Medicare spending for acute hospitals,
- Medicare spending for post-acute care, including spending for LTCHs,
- Medicare spending for the episode of care (Part A services and home health care),

- readmission to acute hospitals, and
- mortality 120 days after acute hospital admission.

We used several approaches to control for severity of illness. First, we controlled for clinical variables available in administrative data. Second, we used an instrumental variable approach to control for unmeasured severity of illness or “selection bias,” which might arise if physicians refer sicker patients to LTCHs from the acute hospital (McClellan et al. 1994). More information about our methodology is found in the last section of this chapter.

What role do long-term care hospitals play in providing care?

Physicians and LTCH administrators told us that long-term care hospitals provide post-acute care and that most patients are transferred from acute hospitals. Analysis of episodes supports these statements—about 80 percent of LTCH patients are transferred from acute hospitals.

LTCHs provide post-acute care to a small number of medically complex patients who are more stable than patients in an intensive care unit (ICU) but may still have unresolved underlying complex medical conditions. Fewer than 1 percent of Medicare beneficiaries discharged from acute hospitals are transferred to LTCHs. Many of these patients require ventilator support for respiratory problems, have failure of two or more major organ systems, neuromuscular damage, contagious infections, or complex wounds needing extended care. LTCH clinicians maintain that they admit patients who have a good prognosis for improvement, which is why they extensively screen patients before admission.

The use of LTCHs is associated with certain diagnoses, severity levels, and the proximity of the facility. Having a diagnosis of tracheostomy is the single strongest predictor of LTCH use, although individuals with tracheostomies represent only 3 percent of LTCH patients. Diagnoses other than tracheostomy also predict long-term care hospital use—respiratory system diagnosis with ventilator support, acute and subacute endocarditis, amputation, skin graft and wound debridement, and osteomyelitis. Having the highest severity level, regardless of diagnosis, almost quadruples the probability of LTCH use.

Living near an LTCH increases a beneficiary’s probability of using such a facility. For example, living in a market area with an LTCH quadruples the probability of LTCH use. Being hospitalized in an acute hospital with an LTCH located within the hospital also quadruples the probability that a beneficiary will use a long-term care hospital.

Where are clinically similar patients treated in areas without long-term care hospitals?

Using quantitative and qualitative analyses, we find that acute hospitals and SNFs are the principal substitutes for long-term care hospitals in areas without LTCHs. In qualitative studies, physicians told us that some patients without access to LTCHs stay longer in the acute hospital and others go to the relatively few SNFs equipped to handle patients with multiple complex illnesses or needing ventilator support. Our empirical results support that assertion.

Acute hospitals Our multivariate analyses support the finding that patients who use LTCHs have shorter acute hospital lengths of stay than similar patients who do not use these facilities. For all acute hospital patients, those who use LTCHs have an acute hospital LOS that is seven days shorter than those who do not. For patients in the top 5 percent probability of using an LTCH, patients who use long-term care hospitals have an acute hospital LOS that is nine days shorter. Shorter hospital lengths of stay for similar patients who use LTCHs suggest that long-term care hospitals substitute for at least part of the acute hospital stay.

Patients similar to those treated in LTCHs are sometimes treated in acute hospital step-down units—units created to step down from ICUs—instead of LTCHs. Some of these units specialize in patients with pulmonary conditions. Interviewees told us that acute hospitals with step-down units may be better equipped to handle patients requiring extended acute care than hospitals without these units. In acute hospitals without step-down units, patients may occupy a critical care or intensive care bed for a longer period, or be transferred to a medical floor.

Skilled nursing facilities Our multivariate results, controlling for severity of illness and other factors, indicate that freestanding SNFs are the principal

alternative to LTCHs, in areas both with and without these facilities. Overall, 24 percent of patients in the top 5 percent probability of using an LTCH use freestanding SNFs; 15 percent of patients with tracheostomies use freestanding SNFs. In both groups, the use of LTCHs is associated with a one-third reduction in the probability of freestanding SNF use. The sharp decrease in probability of use of skilled nursing facilities by long-term care hospital users suggests that SNFs and LTCHs are substitutes.

Our qualitative results on SNFs as an alternative to LTCHs are mixed. During structured interviews, physicians told our contractors that some SNFs are adequately equipped to handle ventilator-dependent patients or others requiring a high level of care, and that these SNFs are the principal alternative to LTCHs. These SNFs offer a level and intensity of care that some respondents thought comparable to that offered in LTCHs. Long-term care hospital clinicians, however, are adamant that treatment provided in SNFs is not as intensive as care provided in LTCHs.

Other settings Beneficiaries in areas without LTCHs are not necessarily excluded from using LTCH services. A few beneficiaries living in areas without LTCHs traveled to an LTCH in 2001. Six percent of patients with tracheostomies who lived in areas without LTCHs used a long-term care hospital (Table 5-2).

Our qualitative and quantitative results are mixed about whether IRFs sometimes substitute for long-term care hospitals. In one market, physicians told our contractors that IRFs actively weaned patients from the ventilator; in another, they said that IRFs only admitted patients who had already been weaned from the ventilator. Quantitative analysis indicates that 7 to 8 percent of patients with the highest probability of using LTCHs (top 5 percent) used IRFs in market areas with and without long-term care hospitals. Among tracheostomy patients who live in areas with LTCHs, 5 percent used IRFs; in areas without LTCHs, 7 percent of patients with tracheostomies used IRFs.

How do Medicare payments and outcomes compare for LTCH patients versus those in other settings?

When LTCH care is not targeted to patients who are most likely to need this level of care, patients who use long-term care hospitals are more costly to Medicare than similar patients using alternative settings. Our multivariate analysis supports this finding. Patients using LTCHs save Medicare money in the acute hospital, principally because of shorter lengths of stay and lower outlier payments; the same patients, however, cost Medicare more money for post-acute care and for the total episode. The cost

TABLE 5-2

Discharge destinations for acute hospital patients, 2001

Type of patient	Long-term care hospital	Freestanding skilled nursing facility	Hospital-based skilled nursing facility	Inpatient rehabilitation facility	Home health care	No post-acute care	Died
Market areas with long-term care hospitals							
All patients	1%	10%	4%	4%	10%	66%	5%
Patients in top 5% probability	4	20	9	8	9	29	20
Patients with tracheostomies	23	11	4	5	4	21	32
Market areas without long-term care hospitals							
All patients	0%	11%	3%	3%	10%	67%	5%
Patients in top 5% probability	0	25	8	7	10	29	20
Patients with tracheostomies	6	17	5	7	6	20	39

Note: Top 5% probability refers to patients in the top 5% probability of using a long-term care hospital. Patients with tracheostomies refers to patients with 96+ hours ventilator support. Percentages may not add to 100 due to rounding.

Source: MedPAC analysis of 2001 claims from CMS.

differences narrow considerably when LTCH care is targeted to patients who are most likely to need this level of care. For example, among patients in the top 5 percent probability of using an LTCH, we find that patients using LTCHs cost Medicare more than patients using alternative settings, but the difference is not statistically significant. For patients with tracheostomies, total episode spending was lower for those who used an LTCH compared with those who did not.

To account for the fact that episodes did not include the cost of readmission to the acute hospital, we compared LTCH users and nonusers without a readmission (about 80 percent of patients) and found similar results. LTCH users cost Medicare more for the total episode compared with patients who used alternative settings. Among patients in the top 5 percent probability of using an LTCH, we found a positive but statistically insignificant difference in total episode spending between LTCH users and nonusers.

Among all patients, LTCHs do not save Medicare money. However, among the most severely ill patients (those with the top 5 percent probability of using an LTCH), Medicare's costs for patients who use LTCHs are comparable to costs for those who use other settings. Among patients with tracheostomies, those who use LTCHs save Medicare money. This finding suggests that LTCH use is best targeted to those patients who need and can benefit from the level of care provided in this setting.

Two caveats apply to our findings on Medicare payments because they are based on actual Medicare spending in 2001. First, acute hospital high-cost outlier payments were unusually high in 2001 (CMS 2003d). As a result, we may be overstating the amount that LTCHs reduced Medicare's spending on outlier payments. Second, 2001 preceded changes in the financial incentives and rates that occurred with the LTCH PPS implementation in 2003. Consequently, Medicare PPS spending for LTCH patients in the top 5 percent and for LTCH patients with tracheostomies may be significantly higher than actual payments in 2001 because of the combination of the PPS rates and improvements in coding. If PPS payments are higher than pre-PPS payments, our findings of savings to Medicare for tracheostomy patients will be overstated. Unfortunately, we cannot be sure how PPS payments compare with pre-PPS payments because coding changes prevent us from being able to model PPS payments accurately. In 2001, LTCHs' payments were unaffected by diagnosis, so coding was incomplete. Now, coding is

likely more complete, but LTCHs may still have difficulty with accurate coding (CMS 2004).

Patients treated in LTCHs tend to have fewer acute hospital readmissions—a measure of outcomes—than patients treated in other settings. Patients using LTCHs were readmitted 26 percent less frequently than similar patients in alternative settings. This finding was not unexpected—LTCHs are acute hospitals and thus can deal with most problems patients might have in-house.

We are unable to reach any conclusions about mortality, another possible outcome measure. In contrast to the results for Medicare payment and readmission, the results for death within 120 days of acute hospital admission conflict, depending on the model used. With ordinary least-squares regression analysis, we find little difference in the death rate for LTCH patients and similar patients treated in alternative settings. With instrumental variable regression analysis, we find that long-term care hospital patients have a higher death rate than patients using alternative settings. Finally, with another method to control for selection bias (the Heckman model), we find that LTCH patients have a lower death rate.

What criteria can we use to better define LTCHs and the patients most appropriate for this type of care?

Our qualitative and quantitative research findings suggest that Medicare should use more precise criteria to ensure that LTCHs treat only appropriate patients. In general, beneficiaries treated in long-term care hospitals cost Medicare more than patients treated in alternative settings; however, if LTCH care is better targeted to those patients who appear to be most suitable for LTCH care, the costs to Medicare are more comparable.

Before proceeding with the discussion of criteria, it is worth reiterating a couple of points. The role of LTCHs is still unclear—especially because some areas of the nation have them and some do not. In the absence of LTCHs, clinically similar patients are principally treated in acute hospitals or in freestanding SNFs that are equipped to handle patients requiring a high level of care.

Criteria that limit the types of patients treated in LTCHs may help avoid some of the problems that may result from current payment incentives, growth of the LTCH industry,

and high payment rates. First, the financial incentives of the acute and long-term care hospital PPSs are likely to encourage facilities to selectively retain and admit certain types of patients to minimize their costs. Acute hospitals have a financial incentive to transfer patients as quickly as possible if they are likely to become high-cost outliers (to avoid losses on these patients). LTCHs have an incentive to admit patients with a given diagnosis who are likely to require the fewest resources. Second, as the number of LTCHs grows, facilities may find it increasingly difficult to find patients who truly require LTCH-level care; this would lead to an increase in lower severity patients being cared for in LTCHs and higher Medicare spending. Finally, LTCH care is costly. The per case base rate is \$37,000 and payments can be as high as \$115,000 per case for the most complex patients.

Therefore, to ensure that patients treated in LTCHs are indeed those for whom this care is the most appropriate and that Medicare is a prudent purchaser, MedPAC supports the adoption of criteria that would delineate the types of patients who are appropriately treated in this setting and more distinctly define these facilities.

LTCH staff adamantly maintain that other post-acute settings cannot substitute for long-term care hospitals and that LTCHs are different in many ways from other settings, especially SNFs. According to their clinicians, long-term care hospitals:

- have sicker patients who are more likely to improve.
- frequently use admission criteria to determine whether patients require an LTCH level of care.
- have active daily physician involvement with patients.
- have licensed nurse staffing of 6 to 10 hours per day per patient (much higher than other post-acute care settings).
- frequently employ specialist registered nurses.
- employ physical, occupational, speech, and respiratory therapists.
- have respiratory therapists available 24 hours per day.
- have multidisciplinary teams that prepare and carry out treatment plans.

The challenge will be to develop criteria that describe the level of care required by LTCH patients so that their needs

are clearly distinguishable from those of less resource-intensive patients who should be treated in other less costly settings. LTCH criteria should focus, to the extent possible, on patients and their care needs, rather than on facility characteristics. The Commission supports the eventual adoption of a common patient assessment tool and classification system across all post-acute settings and the longer term goal of integrating all post-acute payment policies (MedPAC 2001b). However, we recognize that common instruments are not ready to be applied across all settings. Until they are, a combination of facility and patient criteria should be used to distinguish this level of care from other post-acute care settings.

LTCH criteria should meet several goals. The criteria should:

- be feasible to administer and monitor, for both CMS and providers.
- establish clear expectations for providers and hold them accountable for their actions.
- encourage high quality care and require LTCHs to provide information about the quality of care furnished to patients.
- incorporate financial incentives for LTCHs to admit appropriate patients.
- be consistent with payment policies for other providers.

In the next two sections, we present examples of facility- and patient-level criteria that Medicare could use to meet these goals. It is possible that there are additional criteria that might target LTCH care and meet the goals.

Facility criteria

Facility-level criteria should delineate features of the care provided in LTCHs. Some examples include a patient evaluation and review process, a patient assessment tool, and the availability of physicians.

Patient review process These reviews would ensure that all patients treated in LTCHs require this level of care. For example, each LTCH could be required to establish a patient review process that screens patients prior to admission, validates within 48 hours of admission that the cases meet admission criteria, periodically (weekly, for example) evaluates patients throughout their stay, and assesses the available options when patients no longer

meet the continued stay criteria. Documentation of these reviews in the medical records would facilitate monitoring, as would a clear and uniform patient review process.

Standard patient assessment tool This criterion would ensure consistency in the assessment process. For example, LTCHs could use a uniform tool to conduct patient reviews. The patient assessment instrument would need to be a reliable and valid clinical tool appropriate for this level of care. Though most LTCHs already use assessment tools—for example, the Acute Physiology and Chronic Health Evaluation III (Knaus et al. 1991)—all facilities should use the same tool that emphasizes clinical and functional assessments of patients. Such a tool should also facilitate measurement of outcomes by allowing for comparisons of admission and discharge scores.

Level of physician availability Physicians' presence and their active involvement with patients are key aspects of the care that differentiates long-term care hospitals from SNFs. Medicare might distinguish between LTCHs and SNFs by requiring that physicians be involved and available to LTCH patients on a daily basis, but the Secretary would need to determine whether physician availability should be on a 24-hour basis. Consulting physicians, who are frequently part of the treatment team in LTCHs, should be on call and capable of being at the patient's side within a moderate period of time (e.g., an hour).

Average Medicare length of stay greater than 25 days The length of stay criterion, the only criterion currently in place for LTCHs, is intended to ensure that patients require a high level of resources. Without other criteria, however, the length of stay criterion does not prevent SNF-level patients from being treated in LTCHs at much higher costs to Medicare. Over time, as patient criteria clearly delineate the types of patients appropriate for treatment in LTCHs, CMS could reevaluate use of this criterion.

Multidisciplinary team treatment Requiring multidisciplinary teams of professionals, including physicians, to prepare and carry out treatment plans would encourage a team-based focus on patient care. Given the nature of their patient populations and depending on the mix of patients, we would expect LTCHs to have a diverse mix of staff with specific expertise, such as wound care specialists; respiratory therapists capable of rescuing

patients; physical, occupational, and speech therapists; and individuals capable of providing end-of-life counseling. LTCHs could be required to include specific disciplines on staff or create individualized treatment plans for each patient within 24 hours of admission.

Patient criteria

Patient-level criteria would identify specific clinical characteristics and treatments required by patients cared for in LTCHs. All of these criteria would be intended to ensure that the patients admitted to LTCHs require an intensive level of resources and have a good chance of improvement.

National admission and discharge criteria National admission criteria could be required for each of the major categories of patients treated in LTCHs, including respiratory, infectious disease, other medically complex, wound care, rehabilitation, ventilator-weaning, and cardiovascular or peripheral vascular patients. Because these criteria would be specific to each of the most common case types, they would need to be as detailed and clinically relevant as possible. Uniform criteria would ensure consistency in the types of patients being treated at LTCHs. Admission criteria currently exist, such as the InterQual® Long-Term Acute Care Criteria (McKesson Health Solutions 2004). A requirement that patients who do not meet the admission criteria be admitted to a different level of care could reinforce such criteria.

The admission criteria could include the following components:

- The clinical characteristics of the patients, such as specific heart, blood pressure, or respiratory insufficiency rates; open wounds; third degree or necrotic wounds; specific gastrointestinal or hematologic conditions that require frequent blood product replacement; or active infection requiring prolonged treatment. The clinical characteristics would vary by major patient category.
- The need for specific treatments, such as continuous or frequent intravenous fluid or medication administration; telemetry or pulmonary monitoring; pulse oximetry; total parenteral nutrition or enteral feeding; continuous gastrointestinal suction; complex wound care; chest tubes; or ventilator support. The treatments would also vary by major patient category.

Discharge criteria would ensure that patients are medically ready for discharge to less intensive and medically appropriate alternative care settings. For example, separate discharge criteria could be developed for each of the major categories of patients treated in LTCHs and be specific to the discharge destination. In developing these criteria, it would be necessary to ensure that they do not encourage unbundling of care that could be provided in LTCHs and that would create additional costs for Medicare.

Minimum staffing per patient per day A minimum staffing requirement would ensure that LTCHs provide an intensive level of care that is comparable to a step-down unit (from ICU-level care) in a hospital and would reinforce the notion that long-term care hospitals treat medically complex patients who cannot be treated in SNFs. For example, LTCHs could be required to admit only patients who need at least 6.5 hours per day of licensed nurse staffing. Another example might allow substitution of respiratory or physical therapy for licensed nurse hours. Nurse aides' and other unlicensed providers' hours would not be counted toward meeting a staffing requirement.

Patient mix and severity These criteria are directed toward ensuring that LTCHs treat only medically complex cases. For example, one requirement could be that a high share (for example, 85 percent) of a facility's patients must be classified into broad diagnosis categories—such as complex medical, complex respiratory, cardiovascular, ventilator-dependent, or extensive wound care—and that a large share (e.g., 85 percent) of an LTCH's patients demonstrate a high level of severity of illness at admission. When the criteria are first implemented, the shares of patients required to be in the diagnosis categories and required to have a high level of severity of illness might be lower than the proportions eventually envisioned. These lower shares would give LTCHs time to adjust and give CMS time to improve measurement. However, these criteria should become more aggressive over time. The objective is that facilities should be dominated by the treatment of patients appropriate for LTCHs as defined by the criteria. As the required share of severely ill patients increases, it will be necessary to take into consideration coding improvements that LTCHs are likely to make and compensate for them. Otherwise, changes in coding practices might be mistaken for increases in the share of severely ill patients that LTCHs treat.

Facilities that specialize (have a high percentage of patients) in rehabilitation or psychiatric care would not be

long-term care hospitals, but could be converted to rehabilitation or psychiatric facilities and be paid according to their respective PPSs. The Commission believes that a few LTCHs have unique circumstances that have arisen out of historical missions for their communities. These few LTCHs may require special treatment. However, we do not envision special treatment for any long-term care hospital entering the Medicare program.

The Commission's recommendation to better target the patients treated in long-term care hospitals, found below, should not be taken as a blanket endorsement of LTCHs and their role in the post-acute care continuum. The rapid growth in long-term care hospitals, the opportunities for profit, and the fact that patients get care in other settings in markets where LTCHs do not exist all raise concerns for the Commission. The growth and incentives of the LTCHs within hospitals are of particular concern. The Commission considered recommending a moratorium on long-term care hospitals within hospitals, but decided against it at this time. The Commission may reconsider this option in the future depending on continued expansion of this industry, analyses of payments and costs, as well as CMS's administrative actions.

RECOMMENDATION 5A

The Congress and the Secretary should define long-term care hospitals by facility and patient criteria that ensure that patients admitted to these facilities are medically complex and have a good chance of improvement.

- **Facility-level criteria should characterize this level of care by features such as staffing, patient evaluation and review processes, and mix of patients.**
- **Patient-level criteria should identify specific clinical characteristics and treatment modalities.**

RATIONALE 5A

LTCHs are currently defined only by a Medicare average length of stay greater than 25 days. We found that when LTCHs' admissions are not targeted, their patients cost Medicare more than similar patients cared for in alternative settings. The rapid growth in the number of long-term care hospitals, the uneven distribution of LTCHs, and the opportunity for LTCHs to profit from admitting patients with lower severity of illness means that, to be a prudent purchaser, Medicare needs to better define LTCHs and patients appropriate for LTCH care.

IMPLICATIONS 5A

Spending

- The specific spending implications of this recommendation are unknown. CMS will need to develop and implement specific criteria. If the criteria are stringent, Medicare spending for LTCHs will likely decrease.

Beneficiary and provider

- If the criteria are stringent, LTCHs would target their services to more clinically appropriate patients. This may result in some beneficiaries being treated in alternative settings. In areas with high numbers of LTCH beds per beneficiary, some facilities may close. It could also result in LTCHs admitting patients from a larger group of acute hospitals and from a broader geographic area (i.e., expanding their catchment areas).

Compliance issues

The Secretary will need to monitor the compliance of LTCHs with facility- and patient-level criteria. Currently, long-term care hospitals that are out of compliance with the Medicare 25-day average LOS requirement lose their LTCH status and are paid as an acute care hospital. Data submitted to the fiscal intermediaries (cost reports or LOS data supplied by LTCHs that are out of compliance) are used to monitor the LOS requirement. In addition, the Quality Improvement Organizations (QIOs) examine 116 long-term care hospital cases a month to assess medical necessity and to confirm coding.

One option for monitoring compliance with LTCH criteria would be for CMS to require the QIOs to review all LTCH admissions for medical necessity. Another option would be to expand the monthly QIO review to include a statistically representative sample of medical records from each LTCH. Data from such a sample would yield timely information at less cost than a full review. Regardless of the option selected to conduct these reviews, the QIOs will either need additional funds or a change in their scope of work. In addition, CMS will need to develop policies for the treatment of LTCHs out of compliance with the criteria. CMS will need to establish policies about the timing and process by which it will determine that a facility will no longer be paid under the LTCH PPS, as well as the opportunities and processes for appeals.

RECOMMENDATION 5B

The Secretary should require the Quality Improvement Organizations to review long-term care hospital admissions for medical necessity and monitor that these facilities are in compliance with defining criteria.

RATIONALE 5B

LTCHs' compliance with the new criteria will need to be monitored. QIOs are already reviewing LTCH claims for medical necessity and having them monitor compliance would be an appropriate expansion of their role. The QIOs may need either additional funding or a change in their scope of work to appropriately accomplish these tasks.

IMPLICATIONS 5B

Spending

- We expect Medicare spending for QIOs to increase unless there is a change in their scope of work.

Related policy considerations

Refinements to the LTCH payment policies should be consistent with Medicare's longer-term goals for payment policy. These goals include improving quality and promoting patient care in the most appropriate and cost-effective setting.

Quality

In the future, consistent with Medicare's goals for all settings, payments should be tied to improvements in quality of care and maintenance of high quality of care (MedPAC 2004). For example, the Secretary could develop quality indicators for LTCHs, including those that measure improvement in health status from admission to discharge, and require facilities to report their performance on these indicators to CMS. Measures might include rates of ventilator weaning, wound healing, endocarditis cures, emergency department use, avoidable readmissions to short-term acute care hospitals, and mortality, as well as patient safety indicators.

For example, ventilator weaning success rates could serve as a quality indicator. Weaning success rates would reinforce the idea that LTCHs should work aggressively with patients to wean them off ventilator support. A study would be needed to determine how such an outcome should be measured, reported by facilities, and tracked by QIOs. Weaning success rates might be appropriate for tying payments for long-term care hospitals to quality incentives.

Payments for SNFs and acute hospitals

Long-term care hospital payment policies cannot be considered in isolation. Although criteria may ensure that LTCHs treat patients requiring a higher level of care, they would not address shortcomings in other payment systems that likely have encouraged the growth in the number of LTCHs. The classification systems currently used in the SNF and acute hospital PPSs may result in LTCHs treating patients who could be more appropriately treated in these other, less expensive settings. Refinements to the payment policies for SNFs and acute hospitals could ensure that payments more accurately reflect patients' resource needs, thereby encouraging providers to make placement decisions based on the clinical characteristics of the patient, rather than financial considerations.

MedPAC has already recommended that CMS develop a new classification system for SNFs (MedPAC 2004). A new SNF PPS classification system could better target payments to medically complex patients in SNFs and away from the provision of therapy services. Such refinements could make SNFs financially neutral to treating medically complex patients who could be appropriately treated in this lower-cost setting (e.g., wound care, AIDS, ventilator-dependent patients.)

Further study will be needed to determine how the acute hospital PPS contributes to the growth of LTCHs and what changes could be made to better align the incentives. For example, a classification system for acute hospitals that reflects the severity of patients within DRGs might improve the accuracy of payments and make these hospitals more financially neutral to keeping patients longer in this setting. Not only could a more accurate classification system increase payments for the most severely ill patients and decrease the likelihood of care being unbundled to LTCHs, it might lower the number of outliers. Furthermore, acute hospitals that receive increased payments for the sickest patients might establish ICU step-down units that could effectively treat these cases. One result could be slower growth of LTCHs.

Other characteristics of the acute hospital PPS may also have encouraged the development of LTCHs. The current outlier policy—both the fixed losses (\$30,150 beginning April 2004) imposed on every outlier case and the share above the fixed-loss threshold Medicare pays—may encourage those hospitals with an LTCH nearby to transfer cases that are likely to become outliers.

Conversely, the policy may disadvantage hospitals that do not have an LTCH nearby. Adjusting the outlier threshold or the share above the threshold that Medicare pays might make hospitals less inclined to transfer cases they could appropriately treat themselves.

The transfer policy may also need refinement to more accurately reflect the types of patients most frequently transferred to LTCHs. Our analysis indicates that, of the 11 DRGs most frequently transferred to LTCHs, 5 are not included in the current transfer policy.

LTCHs within hospitals

The interrelated nature of the payment policies for acute and long-term care hospitals is most evident in the increasing number of LTCHs within hospitals (see text box). Since implementation of the PPS, the number of LTCHs has increased by almost 50 percent (CMS 2004). Virtually all of these new facilities are LTCHs within hospitals. CMS maintains that these LTCHs may increase their host hospitals' ability to profit from the acute hospital PPS. The acute hospital can simply shorten the stays of certain patients (who could have remained in the acute hospital under the original DRG payment) and transfer them to its in-house LTCH, thus generating two discharges and increasing Medicare's costs (CMS 2003e). CMS plans to issue new regulations to prohibit such practices. We agree with the concerns expressed by CMS and look forward to publication of the new regulations, which we will review.

Technical methodology section

In this section we present more information about our methods. In creating the data set, we constructed 5.5 million episodes—100 percent of the episodes for beneficiaries admitted to acute hospitals in the first six months of 2001. After exclusions, we had a data set of 4.3 million episodes. We excluded 1.2 million patients who were unlikely to be transferred to an LTCH because they had a very short LOS, defined as less than or equal to the 10th percentile of the LOS for their all patient refined DRG (APR-DRG). About 100,000 additional episodes were excluded because of missing data.

We defined two subpopulations and performed separate analyses on them. The first subpopulation consists of individuals in the top 5 percent probability of using an

More on long-term care hospitals within hospitals

The number of long-term care hospitals (LTCHs) located within acute hospitals has grown at almost three times the rate of long-term care hospitals in general—35 percent per year between 1993 and 2003 compared with 12 percent. By 2004, LTCHs within hospitals made up one-half of all long-term care hospitals. The growth of these long-term care hospitals is important for several reasons. First, our analyses suggest that admission to an acute hospital that hosts an LTCH within it is a very strong predictor of long-term care hospital use. Second, CMS maintains that LTCHs within hospitals may increase the host hospitals' ability to profit from the acute hospital prospective payment system by shortening the length of stay (LOS) and profiting from a per case payment based on a longer LOS. Host hospitals may more quickly transfer patients to LTCHs within hospitals and increase Medicare's costs by generating two discharges. In the absence of LTCHs within hospitals, these patients might have remained in the acute hospital under the original diagnosis related group payments.

On average, LTCHs within hospitals are smaller than freestanding long-term care hospitals—36 beds compared with 111 beds. They also have stronger relationships with one acute hospital—LTCHs within hospitals received 61 percent of cases from their most frequent referrer compared with freestanding LTCHs' 42 percent of cases received from one acute hospital.

LTCHs within hospitals are subject to few restrictions. They are required to have a separate governing body, chief financial officer, chief medical officer, and medical staff. In addition, they currently must meet one of the following three criteria:

- perform basic functions independently from the host hospital,
- incur no more than 15 percent of total inpatient operating costs for items and services supplied by the host hospital, or
- have an inpatient load of which at least 75 percent of patients are admitted from sources other than the host hospital.

CMS requires that LTCHs within hospitals report to their fiscal intermediaries that they are co-located with acute hospitals. However, these long-term care hospitals currently are not required to report the provider number, name, or address of the co-located acute hospital. Such a reporting requirement would help CMS and researchers monitor these facilities to understand referral patterns and patient mix, especially if the reporting were recorded in the Provider of Services file. ■

LTCH (between 3.4 and 33 percent). The cutoff value (3.4 percent) represents the 95th percentile of predicted probabilities (most observations have predicted probabilities below 1 percent). The second subpopulation consists of individuals assigned to the tracheostomy APR-DRG (004, defined as tracheostomy with ventilator for 96 or more hours or primary diagnosis except for face, mouth, or neck diagnoses).

Post-acute spending includes payments for all care in SNFs, IRFs, LTCHs, and for home health services during the episode. Total spending includes payments to acute hospitals in addition to post-acute spending. Spending for

readmissions to the acute hospital are not included in the total episode spending, nor is any spending for physician or outpatient services. All spending is standardized for the effects of the wage indexes.

To control for clinical characteristics, we assigned patients to APR-DRGs using acute hospital diagnoses and derived severity of illness and risk of mortality scores (3M 1998). We combined these with other clinical variables—age, prior hospitalization, critical care unit (CCU) days, and ICU days—to determine the probability of LTCH use. Patients in the top 5 percent are much more likely than the general population to have high severity levels (3 or 4),

high mortality risk scores (3 or 4), ICU use, prior hospitalizations, and the following diagnoses: tracheostomy, amputation, endocarditis, skin graft, skin ulcers, or osteomyelitis.

We defined patients' proximity to an LTCH according to the Dartmouth Atlas (Wennberg et al. 1999).

Beneficiaries' zip codes link patients to hospital service areas (HSAs) and hospital referral regions (HRRs) (Center for the Evaluative Clinical Sciences 2003). There are 3,253 HSAs without LTCHs and 183 with LTCHs. To control for supply of post-acute care services, we also calculated SNF and IRF beds per acute hospital discharge by HSA.

To control for patients' socioeconomic status, we used the following variables by patients' county of residence from the 2001 Area Resource File (HRSA 2001): five-year infant mortality rate, percentage of persons with four years of college, percentage of persons with income below federal poverty level, and per capita income. To control for different rates of Medicare service use, we calculated a ratio of per capita total service use by county (MedPAC 2001a). This index includes all types of Medicare spending and is a measure of general practice patterns. Characteristics of acute hospitals include ownership, ratio of interns and residents to beds, and presence of an SNF, IRF, or LTCH within the hospital.

We used an instrumental variable approach to control for unmeasured severity of illness (selection bias) (McClellan et al. 1994). This approach consists of constructing a proxy for LTCH use that represents the odds of using an LTCH. We modeled these odds as a function of patient characteristics and instruments that are thought to be correlated with using an LTCH but not correlated with the severity of illness variables. The instruments include whether:

- an LTCH operates in the beneficiary's HSA,
- an LTCH operates in the beneficiary's HRR, and
- the patient is discharged from an acute hospital that has an LTCH within the hospital.

The intuitive idea of these instrumental variables is that patients in close proximity to a long-term care hospital will have a higher probability of using an LTCH. We then test whether patients with a high probability of using LTCH services because an LTCH is nearby have different outcomes than those who have a very low probability of using LTCHs because they are farther away.

We used two-stage least squares to estimate the instrumental variable model. Most episodes had predicted probabilities below 1 percent. The predicted probability of LTCH use was calculated for all observations using a logit model that includes clinical factors (i.e., APR-DRGs, APR-DRG severity level code, APR-DRG mortality risk code, prior hospitalization, ICU use, and CCU use) and demographic factors (age group and sex). The coefficients were calculated among individuals living in hospital service areas with LTCHs.

We used a second method for controlling for selection bias (unmeasured severity) (Heckman 1979). Rather than avoid the sample selection problem by using a proxy for LTCH use, this method creates a new variable that is used to adjust for unmeasured severity. The model has strong untestable assumptions regarding the distribution of the error terms and should be used with great caution (Duan et al. 1983). We use the Heckman model as a second check on our instrumental variable approach. We also conduct ordinary least-squares regressions. ■

References

- 3M Health Information Systems. 1998. *All patient refined diagnosis related groups (APR-DRGs), version 15: Definitions manual*. Wallingford, CT: 3M.
- Center for the Evaluative Clinical Sciences at Dartmouth Medical School. 2003. *Zip code to HSA to HRR Crosswalk File*. Hanover, NH: Center for the Evaluative Clinical Sciences at Dartmouth Medical School.
- Centers for Medicare & Medicaid Services, Department of Health and Human Services. 2004. Medicare Program; prospective payment system for long-term care hospitals; proposed annual payment rate updates and policy changes; proposed rule. *Federal Register* 69, no. 20 (January 30): 4754–4817.
- Centers for Medicare & Medicaid Services, Department of Health and Human Services. 2003a. Medicare and Medicaid; skilled nursing facilities; prospective payment system and consolidated billing; update. *Federal Register* 68, no. 149 (August 4): 45823–45825.
- Centers for Medicare & Medicaid Services, Department of Health and Human Services. 2003b. Medicare; hospital inpatient prospective payment system and 2004 fiscal year rates. *Federal Register* 68, no. 148 (August 1): 45345–45672.
- Centers for Medicare & Medicaid Services, Department of Health and Human Services. 2003c. Medicare and Medicaid program; hospital inpatient rehabilitation facilities prospective payment system and 2004 fiscal year rates. *Federal Register* 68, no. 148 (August 1): 45673–45728.
- Centers for Medicare & Medicaid Services, Department of Health and Human Services. 2003d. Medicare program; change in methodology for determining payment for extraordinarily high-cost cases (cost outliers) under the acute care hospitals inpatient and long-term care hospital prospective payment systems. *Federal Register* 68, no. 110 (June 9): 34494–34515.
- Centers for Medicare & Medicaid Services, Department of Health and Human Services. 2003e. Medicare program; prospective payment system for long-term care hospitals: proposed annual payment rate updates and policy changes; proposed rule. *Federal Register* 68, no. 45 (March 7): 11234–11292.
- Duan, N., W. G. Manning, C. N. Morris, et al. 1983. Comparison of alternative models for the demand of medical care. *Journal of Business & Economic Statistics* 1, no. 2 (April): 115–126.
- Health Resources and Services Administration, Department of Health and Human Services. 2001. *User documentation for the area resource file*. Rockville, MD: Bureau of Health Professions, HRSA.
- Heckman, J. J. 1979. Sample selection bias as a specification error. *Econometrica* 47, no. 1 (January): 153–162.
- Knaus, W. A., D. P. Wagner, E. A. Draper, et al. 1991. The APACHE III prognostic system: Risk prediction of hospital mortality for critically ill hospitalized adults. *Chest* 100, no. 6 (December): 1619–1636.
- Liu, K., C. Baseggio, D. Wissoker, et al. 2001. Long-term care hospitals under Medicare: Facility-level characteristics. *Health Care Financing Review* 23, no. 2 (Winter): 1–18.
- McClellan M., B. J. McNeil, and J. P. Newhouse. 1994. Does more intensive treatment of acute myocardial infarction reduce mortality? Analysis using instrumental variables. *Journal of the American Medical Association* 272, no. 11 (September 21): 859–866.
- McKesson Health Solutions, LLC. 2004. *InterQual® Long-Term Acute Care Criteria, 2004*. Copyright 2004 McKesson Corporation and/or one of its subsidiaries. All Rights Reserved; Newton, MA: McKesson.
- Medicare Payment Advisory Commission. 2004. *Report to the Congress: Medicare payment policy*. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2003. *Report to the Congress: Variation and innovation in Medicare*. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2001a. *Report to the Congress: Medicare in rural America*. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2001b. *Report to the Congress: Medicare payment policy*. Washington, DC: MedPAC.
- Wennberg J. E., M. M. A. Cooper, J. D. Birkmeyer, et al. 1999. *The Dartmouth atlas of health care in the United States*. Hanover, NH: Dartmouth Medical School.

