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Long-term acute care hospital utilization after critical illness

Jeremy M. Kahn, MD, MSc[1,2,3], **Nicole M. Benson, BS**[2], **Dina Appleby, MS**[2], **Shannon S. Carson, MD**[4], and **Theodore J. Iwashyna, MD, PhD**[5]

[1] Division of Pulmonary, Allergy and Critical Care, University of Pennsylvania School of Medicine, Philadelphia, PA

[2] Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania School of Medicine, Philadelphia, PA

[3] Leonard Davis Institute of Health Economics, University of Pennsylvania, Philadelphia, PA

[4] Division of Pulmonary and Critical Care; University of North Carolina School of Medicine, Chapel Hill, NC

[5] Division of Pulmonary and Critical Care, University of Michigan School of Medicine, Ann Arbor, MI

Abstract

Context—Long-term acute care hospitals have emerged as a novel approach for the care of patients recovering from severe acute illness, but the extent and growth of their activity at the national level is unknown.

Objective—To examine temporal trends in long-term acute care hospital utilization after an episode of critical illness among fee-for-service Medicare beneficiaries ≥ 65 years of age.

Design, Setting and Patients—Retrospective cohort study using the Medicare Provider Analysis and Review files from 1997 to 2006. We included all Medicare hospitalizations involving admission to an intensive care unit of an acute-care, non-federal hospital within the continental United States.

Main outcome measures—Overall long-term acute care utilization, associated costs, and survival following transfer.

Results—The number of long-term acute care hospitals in the United States increased at a mean rate of 8.8% per year, from 192 in 1997 to 408 in 2006. During that time, the annual number of long-term acute care admissions after critical illness increased from 13,732 to 40,353, with annual costs increasing from $484 million to $1.325 billion. The age-standardized population incidence of long-term acute care utilization after critical illness increased from 38.1/100,000 in 1997 to 99.7/100,000 in 2006, with greater use among male individuals and black individuals in all time periods. Over time, transferred patients had higher numbers of comorbidities (5.0 in 1997–2000 versus 5.8 in 2004–2006, p<0.001), and were more likely to receive mechanical ventilation at the long-term acute care hospital (16.4% in 1997–2000 versus 29.8% in 2004–2006, p<0.001). One-year mortality after long-term acute care hospital admission was high throughout the study period: 50.7% in 1997–2000 and 52.2% in 2004–2006.

Contact: Jeremy M. Kahn, MD MSc, Assistant Professor of Medicine and Epidemiology, Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania School of Medicine, Blockley Hall 723, 423 Guardian Drive, Philadelphia, PA 19104, Phone: 215.573.7791, jmkahn@mail.med.upenn.edu.

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Conclusions—Long-term acute care hospital utilization after critical illness is common and increasing. Survival among Medicare beneficiaries transferred to long-term acute care after critical illness is poor.

INTRODUCTION

Approximately 10–20% of patients recovering from critical illness experience persistent organ failures necessitating complex care for a prolonged period of time.[1] Traditionally these patients spent their entire acute care episode in a general medical-surgical hospital. However, in recent years long-term acute care hospitals have emerged as a novel care model for patients recovering from severe acute illness.[2] Long-term acute care hospitals are defined by the Centers for Medicare and Medicaid Services (CMS) as acute care hospitals with a mean length of stay equal to or greater than 25 days.[3] Typically these hospitals provide care for patients who do not require all of the services of a short stay hospital but still have significant ongoing care needs. In the post-intensive care unit (ICU) setting, these hospitals act as specialized hospitals for patients requiring prolonged mechanical ventilation and those with other types of chronic critical illness.[4, 5]

With the aging of the population and advances in critical care, the incidence of chronic critical illness is expected to rise in the coming years.[6] Long-term acute care hospitals could play a particularly important role in caring for these patients. Yet despite their growing role, few population-based data exist on overall patterns of long-term acute care use, and little is known about how the characteristics of patients transferred into long-term acute care have evolved over time. The purpose of this study was to examine the epidemiology of long-term acute care hospital utilization after critical illness in the United States (US) using hospitalization data in fee-for-service Medicare beneficiaries. Such information can inform health policy and future planning with respect to these hospitals, as well as help policy makers understand how novel organizational structures impact health care as a whole.

METHODS

Study design and data

We performed a retrospective cohort study of long-term acute care utilization after critical illness in the United States from 1997 to 2006. We obtained patient-level hospitalization data from the CMS Medicare Provider Analysis and Review (MedPAR) files. MedPAR contains detailed demographic and clinical data on hospitalizations for fee-for-service Medicare beneficiaries.[7] Medicare is the payer for approximately 70% of long-term acute care hospitalizations and is the only national data source for these hospitalizations in the US.[8] Hospital characteristics were obtained from the CMS Healthcare Cost Report Information System (HCRIS).[9] Year-specific population estimates were obtained from the Centers for Disease Control and Prevention's National Center for Health Statistics (www.cdc.gov/nchs).

Patients and variables

We examined all MedPAR hospitalizations involving admission to an intensive care unit (ICU) in a general acute-care hospital, using ICU-specific resource utilization codes that included general ICUs, specialty ICUs and coronary care units but excluded intermediate care units.[10] General acute-care hospitals were defined using short-stay admission codes in MedPAR. We did not include hospitalizations that did not involve an ICU admission, even if the patient was subsequently transferred to a long-term acute care hospital. These patients are unlikely to be as medically complex as those transferred after an ICU stay, and the role of long-term acute care hospitals in their care is less well defined. We excluded hospitalizations in Alaska and Hawaii, since the unique geography of these states limits access to long-term acute care. We also excluded hospitalizations for patients aged <65 at the time of admission, since these patients are typically enrolled in Medicare due to disability or end-stage renal disease, and may not be representative of the elderly population as a whole.

Long-term acute care hospitals were identified using the HCRIS database (provider type = general long-term) and MedPAR provider numbers (provider type = long-term hospital). These fields are based on Medicare certification and can be used to differentiate long-stay hospitals from short-stay hospitals and skilled nursing facilities. For hospitals in which one but not both of these data sources indicated long-term acute care status (274 of 8,514; 3.2%) we performed internet searches and placed telephone calls to confirm the hospital type. We defined long-term acute care hospital transfers as temporally adjacent hospitalizations (i.e., discharge from the first hospital on day n and admission to the second hospital on day n or n +1), in which the first hospitalization is in a short-stay hospital and the second hospitalization is in a long-term acute care hospital.[11] For ICU admissions that did not result in a long-term acute care transfer, we used the MedPAR discharge location field to determine the patient's discharge status, excluding patients with unknown discharge status (0.04% of total) and patients discharged to another short stay hospital (8.0% of total).

Patient-level demographic and clinical data were obtained directly from the Medicare claims. Race was grouped into black, white and other.[12] Primary diagnoses, surgical status, co-morbid conditions, and use of mechanical ventilation were obtained from *International Classification of Diseases* diagnosis and procedure codes, as previously validated.[13–16] Patient-level hospital costs for both short-stay and long-term acute care hospitals were determined from the claims by multiplying individual departmental charges by department-specific cost-to-charge ratios obtained from HCRIS.[17] All costs were adjusted for inflation using the consumer price index and are reported in 2006 dollars. Post-discharge survival for each hospitalization was obtained from death dates reported in the Medicare Denominator file.

Analysis

Variables are reported as means and standard deviations, medians and interquartile ranges, or frequencies and percents. We tabulated long-term acute care transfer rates as a proportion of all ICU-related discharges over time. We separately examined transfer rates in the subgroup of patients requiring mechanical ventilation in the short-stay hospital, as we hypothesized that long-term acute care utilization would be especially high in this group. We graphed trends in the total number of long-term acute care hospitals, beds and total associated costs over time. We examined the age-standardized gender-and race-specific incidence of long-term acute care transfer over time using population data from the US Census. These subgroups were specified *a priori*. We tested the statistical significance of temporal trends using linear, logistic or Poisson regression, as appropriate. Year-specific differences in population-adjusted long-term acute care utilization between gender and racial groups were evaluated using a chi-square test. To evaluate whether changes in population-adjusted incidence over time differed between gender and racial groups, we fit interaction terms between groups and time in our regression models.

To examine patient demographics, clinical characteristics and outcomes between time periods we grouped years into three time periods, 1997–2000, 2001–2003, and 2004–2006. We tested differences between time-periods using chi-squared tests, analysis of variance, or Kruskal-Wallistests, as appropriate. However, due to the large sample size we evaluated differences between time periods based on clinical as well as statistical significance. One-year mortality after transfer to a long-term acute care hospital was evaluated using Kaplan-

Meier curves, both for all patients and patients categorized by mechanical ventilation use (none, ventilation at the originating hospital only, or ventilation at both the originating hospital and the long-term acute care hospital). This analysis is performed for 2006 only. Differences in the survival functions between ventilation groups were evaluated using the log-rank test. For the demographic and survival analyses we examined only the first transfer for each patient.

Statistical analyses were performed using SAS 9.1 (Cary, NC) and Stata 11.0 (College Station, TX). All tests are two-tailed, and a P value of ≤0.05 was considered significant. This project was approved by the University of Pennsylvania Institutional Review Board.

RESULTS

There were 18,690,469 eligible hospitalizations involving an ICU stay during the study period. The overall number of Medicare ICU admissions declined each year, from 1,901,630 in 1997 to 1,637,581 in 2006 (Table 1). Yet during that time, the absolute number of long-term acute care transfers, as well as long-term acute care transfers as a proportion of all ICU discharges, steadily increased. Critical care hospitalizations ending in a long-term acute care transfer increased from 13,732 (0.7%) in 1997 to 40,353 (2.5%) in 2006 ($p<0.001$). During that time, the percentage of critical care hospitalizations ending in transfer to skilled nursing or rehabilitation facility also increased, while the percentage of critical care hospitalizations ending in discharge to home fell. Mortality rates were relatively constant. Examining patients receiving invasive mechanical ventilation separately (n=2,380,881; 12.7% of total), ICU hospitalizations ending in a long-term acute care transfer increased from 7,126 of 217,514 critical care hospitalizations (3.3%) in 1997 to 19,781 of 227,152 critical care hospitalizations (8.7%) in 2006 ($p<0.001$). During that time period, the percentage of critical care hospitalizations involving mechanical ventilation ending in discharge to home fell, while other discharge dispositions (skilled nursing or rehabilitation facility, death) remained relatively constant.

The increase in the number of transfers was reflected in an increase in the number of long-term acute care hospitals, long-term acute care beds and long-term acute care-associated costs following critical illness (Figure 1). The number of long-term acute care hospitals increased at a mean rate of 8.8% per year, from 192 in 1997 to 408 in 2006 (p-value for linear trend <0.001). The number of long-term acute care hospital beds increased from 16,523 in 1997 to 27,623 in 2006 (mean rate of increase: 5.9% per year, $p<0.001$) while the total associated costs increased from $484 million in 1997 to $1.325 billion in 2006 (mean rate of increase: 12.1%, $p<0.001$).

We observed similar increases in the age-adjusted incidence of long-term acute care hospital transfer at the population level (Figure 3). Transfers after critical illness increased from 38.1 per 100,000 capita in 1997 to 99.7 per 100,000 capital in 2006 (Figure 3a, $p<0.001$). The age-adjusted incidence of transfers was higher for male individuals (Figure 3b) and black individuals (Figure 3c) in all time periods ($p <0.001$). Race differences were particularly large, with black individuals consistently experiencing over twice the transfer rate as white individuals. For example, in 2006 the age-adjusted transfer rate was 182.0 per 100,000 for black individuals compared to 89.6 per 100,000 for white individuals. The rate of increase was not different by gender (p-value for interaction term: 0.60) or race (p-value for interaction term: 0.10).

Patient characteristics over time are shown in Table 1. Age, gender, and racial distribution and length of stay prior to transfer varied little over the study period. However, the incidence of co-morbid conditions, the incidence of sepsis at the originating hospital, and the percentage of patients receiving mechanical ventilation at the long-term acute care hospital all increased. Additionally, the final discharge destination after transfer changed over time, with more patients discharged to a skilled nursing or rehabilitation facility (19.9% in 1997–2000, 34.9% in 2004–2006, p<0.001), and fewer patients discharged to home (32.3% in 1997–2000, 27.4% in 2004–2006, p<0.001). Nearly 20% of patients were transferred back to an acute care facility, a figure that decreased over time (19.6% in 1997–2000, 14.2% in 2004–2006, p<0.001).

One year mortality was poor, ranging from 48.2% to 52.2% over the study period. Compared to other patients, lower survival was observed for patients receiving mechanical ventilation at the long-term acute care hospital (Figure 4, data for 2006 only, n=38,423). One year mortality was 46.2% for patients never receiving mechanical ventilation (n=18,660), 48% for patients receiving mechanical ventilation in the short stay hospital only (n=8,068), and 69.1% for patients receiving mechanical ventilation in both the short stay hospital and the long-term acute care hospital (n=11,695) (p<0.001 using log-rank test).

DISCUSSION

In the first national longitudinal study of long-term acute care hospital admissions, we found that these hospitals are an increasingly common discharge location following an episode of critical illness, even as overall Medicare ICU utilization decreases. The number of these hospitals doubled, and critical care hospitalizations ending in long-term acute care transfer and long-term acute care-related costs more than tripled in the 10 year study period. Over time transferred patients had higher numbers of comorbidities and were more likely to receive mechanical ventilation at the long-term acute care hospital, likely representing a trend toward sicker patients increasingly being transferred for ventilator weaning. Survival after transfer was generally poor, with the poorest outcomes among patients receiving mechanical ventilation at the long-term acute care hospital.

Despite this dramatic rise in long-term acute care utilization over the years there is surprisingly little clinical evidence in support of long-term acute care hospitals as a model of care for patients recovering from critical illness. Long-term acute care hospitals are only one of several available care models for these patients. For the most severely ill, these hospitals are an alternative to step-down units or continued care in an acute care ICU. For the less severely ill, they are an alternative to care in a skilled nursing or inpatient rehabilitation facility. Whether or not these hospitals meaningfully improve outcomes for either patient group is unknown. They might favorably impact outcomes by providing clinicians experienced in the care of the chronically critically ill,[18] or might negatively impact outcomes by offering less intense clinician staffing[19] and by fragmenting the episode of acute care.[20] To date, observational studies evaluating outcomes in long-term acute care hospitals demonstrate mixed results, in general suggesting that they do not improve long-term survival.[21, 22] Our findings highlight the need for additional research into the clinical effectiveness of long-term acute care hospitals. Observational studies and perhaps even randomized clinical trials are necessary to determine the potential clinical benefit of transfer.

In the absence of demonstrated efficacy, long-term acute care hospital expansion appears to be driven by financial incentives that favor out-of-hospital transfer after critical illness. Compared to short stay hospitals, long-term acute care hospitals operate with relatively high margins and are a profitable sector of the health care market.[23] Additionally, under prospective payment, short-stay hospitals financially benefit by discharging patients with severe acute illness early in their course.[24] Short stay hospitals may also financially benefit by freeing ICU beds for more profitable cases such as elective surgeries. Economic evaluations of long-term acute care hospital use generally show that transfers are cost-saving for short-stay hospitals.[21, 22] However, the overall economic impact to society is unknown.

These issues have important implications to health care beyond just long-term acute care hospitals themselves. Organizational innovations supported by unplanned financial incentives can dramatically change the health care system, even in the absence of demonstrated effectiveness. Other recent examples include physician-owned specialty hospitals, retail clinics and home health services.[25–27] In an era of constrained resources, it is important to recognize how our payment systems can drive the rapid growth of some health sectors, potentially increasing costs without favorably impacting quality. CMS acknowledged this tension in the long-term acute care sector by instituting a moratorium on new long-term acute care hospitals in 2007. However, this moratorium will expire in late 2010, bringing these issues to the policy forefront once again.

We observed significantly higher utilization among black patients compared to white patients at the population level. This finding may reflect a preference for more aggressive treatment at the end of life among black patients.[28] Black patients are less likely to have do not resuscitate orders in place at the time of hospitalization,[29] and are less likely to favor withdrawal of life sustaining measures in the ICU.[30] The possibility that long-term acute care hospitals are used as an alternative to withdrawal of support in the ICU among patients with poor prognoses warrants further study. There are other potential explanations for this finding, including a higher incidence of critical illness among black individuals[31] or a higher concentration of these hospitals in urban areas.

We also observed extremely poor one-year survival among Medicare beneficiaries transferred to long-term acute care hospitals. The mortality rates we observed are substantially higher than the general population of Medicare ICU survivors, in which one year survival is 21.5%.[32] Our findings confirm previous reports in smaller cohorts demonstrating one-year survival of patients requiring prolonged mechanical ventilation ranging from 49% to 77%.[33–38] Many patients transferred to long-term acute care hospitals for ventilator weaning do not successfully wean, and either become ventilator dependent or die in the acute care setting.[39] Yet data suggest that patients, families and physicians may not fully understand the extent of the poor prognosis of this population.[40] Strategies to improve both prognosis and communication about prognosis are needed to ensure that decision-makers do not have unreasonable expectations surrounding long-term acute care.

In contrast to increasing long-term acute care hospital utilization, we found that overall Medicare ICU admissions are decreasing over time. This finding is likely due to a decrease in the number of US hospitals providing critical care with a subsequent centralization of ICU sevices.[41] As critical care becomes more centralized, moderate severity patients in small hospitals may receive care on hospital wards rather than in ICUs. Our findings reflect those of a previous study showing that Medicare accounts for a smaller proportion of US critical care as a whole.[41]

Our work has several limitations. First, we studied only data on fee-for-service Medicare beneficiaries. Although this means that we missed some long-term acute care hospital transfers, Medicare is the payer for approximately 70% of all long-term acute care discharges.[8] Additionally, MedPAR is the only national dataset of these discharges. Any all-payer study would necessarily be limited to specific regions and may not fully capture national trends. Nonetheless our analyses may underestimate long-term acute care utilization and costs. Second, we studied only transfers after an episode of critical illness. Many patients are transferred after hospitalizations that do not involve an ICU stay. We chose to focus on post-ICU utilization since these patients are of high acuity compared to other hospitalized patients and therefore may be most likely to benefit from a long-term acute care stay. The role of these hospitals in the care of patients with low severity of illness warrants additional study.

The clinical and economic burden of patients with chronic critical illness is significant, and likely to expand with the aging of the population and advances in critical care that increase patient survival. Long-term outcomes of the chronically critically ill are poor, with substantial need for new approaches to their care. We demonstrate that long-term acute care hospitals play an increasingly important role in patients with chronic critical illness, despite scant data to guide decision-making about transfer or inform policy decisions about whether to support or restrict this rapidly growing cost center. Our results underscore the surprising flexibility of the medical system in adopting new organizational innovations, and highlight the need for a diverse program of comparative effectiveness research to determine the optimal organization of care for patients recovering from critical illness, including the best way to maximize survival and control costs for this high-risk patient group.

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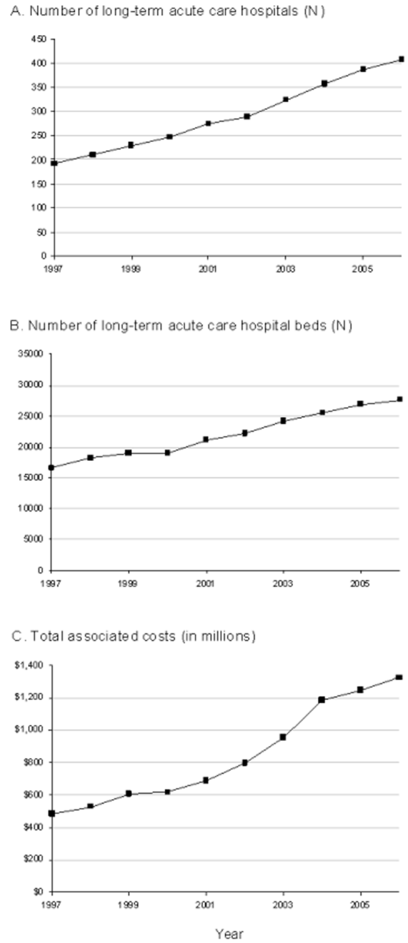

Figure 1.

Temporal trends in long-term acute care hospitals (panel A), long-term acute care beds (panel B) and long-term acute care -associated costs after critical illness (panel C).[a]

[a] P-values for linear trends <0.001 for all panels.

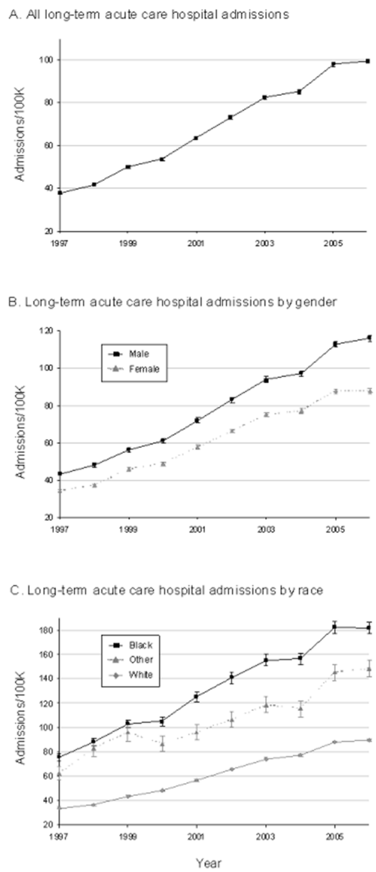

Figure 2.

Population-adjusted incidence of long-term acute care hospital transfer after critical illness over time, for entire United States population (panel A), population by gender (panel B) and population by race (panel C). [a]

[a] P-values for linear trends <0.001 for all panels.

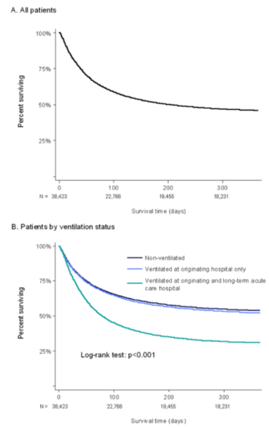

Figure 3.
Kaplan-Meier curves for one-year survival after transfer to a long-term acute care hospital, both for all patients (panel A) and for patients by ventilation status at originating hospital and long-term acute care hospital (panel B).

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Table 1

Temporal trends in discharge location after critical illness, both for all patients and for patients receiving invasive mechanical ventilation.

	Discharge location[a]				Total
	Home	SNF/Rehab	Long-term acute care	Dead	
All patients					
1997	1,325,275 (69.7%)	317,681 (16.7%)	13,732 (0.7%)	244,942 (12.9%)	1,901,630
1998	1,234,958 (68.1%)	326,772 (18.0%)	15,338 (0.8%)	237,224 (13.1%)	1,814,292
1999	1,172,409 (67.1%)	318,650 (18.2%)	18,562 (1.1%)	238,739 (13.7%)	1,748,360
2000	1,139,055 (66.9%)	310,245 (18.2%)	20,324 (1.2%)	233,206 (13.7%)	1,702,830
2001	1,119,163 (66.0%)	315,560 (18.6%)	24,169 (1.4%)	236,278 (13.9%)	1,695,170
2002	1,097,505 (63.6%)	354,663 (20.5%)	28,082 (1.6%)	246,340 (14.3%)	1,726,590
2003	1,064,288 (61.6%)	381,806 (22.1%)	31,879 (1.8%)	249,050 (14.4%)	1,727,023
2004	959,712 (60.3%)	373,677 (23.5%)	33,331 (2.1%)	224,556 (14.1%)	1,591,276
2005	968,053 (58.6%)	393,045 (23.8%)	39,202 (2.4%)	250,977 (15.2%)	1,651,277
2006	944,601 (57.7%)	402,126 (24.6%)	40,353 (2.5%)	250,501 (15.3%)	1,637,581
Mechanically ventilated patients					
1997	66,970 (30.8%)	43,867 (20.2%)	7,126 (3.3%)	99,551 (45.8%)	217,514
1998	63,577 (29.4%)	46,537 (21.5%)	7,954 (3.7%)	98,091 (45.4%)	216,159
1999	61,156 (28.3%)	45,252 (20.9%)	9,439 (4.4%)	100,628 (46.5%)	216,475
2000	58,101 (27.5%)	43,899 (20.8%)	10,048 (4.8%)	98,902 (46.9%)	210,950
2001	56,296 (26.4%)	44,897 (21.1%)	11,574 (5.4%)	100,455 (47.1%)	213,222
2002	55,474 (24.6%)	51,032 (22.7%)	13,214 (5.9%)	105,390 (46.8%)	225,110
2003	54,294 (23.6%)	54,732 (23.8%)	14,887 (6.5%)	105,884 (46.1%)	229,797
2004	49,708 (23.1%)	54,813 (25.4%)	15,970 (7.4%)	94,906 (44.1%)	215,397
2005	49,638 (21.3%)	58,085 (24.9%)	19,093 (8.2%)	10,6190 (45.6%)	233,006
2006	46,757 (20.6%)	56,918 (25.1%)	19,781 (8.7%)	103,696 (45.7%)	227,152

[a]Values are frequency and row percents. Percentages may not add to 100 due to rounding. P-value <0.001 for increasing long-term acute care hospital utilization across years

SNF/rehab = skilled nursing facility/rehabilitation hospital.

Table 2

Characteristics of patients transferred to long-term acute care hospitals after critical illness.

Variable	1997 – 2000 (n=63,414)	2001 – 2003 (n=77,721)	2004 – 2006 (n=103,486)
Age	76.9 ± 7.3	77.0 ± 7.3	76.8 ± 7.5
Female gender (%)	33,850 (53.4%)	41,176 (53.0%)	53,595 (51.8%)
Race (%)			
White	50,077 (79.0%)	61,757 (79.5%)	81,968 (79.2%)
Black	10,606 (16.7%)	12,612 (16.2%)	16,394 (15.8%)
Other	2,731 (4.3%)	3,352 (4.3%)	5,124 (5.0%)
Primary diagnosis at originating hospital (%)			
Medical			
Respiratory	15,778 (24.9%)	15,930 (20.5%)	21,223 (20.5%)
Cardiac	6,634 (10.5%)	8,423 (10.8%)	8,394 (8.1%)
Neurological	5,331 (8.4%)	6,489 (8.4%)	7,004 (6.8%)
Other	8,451 (13.3%)	11,923 (15.3%)	18,874 (18.2%)
Surgical			
General	17,118 (27.0%)	22,571 (29.0%)	32,565 (31.5%)
Cardiac	7,380 (11.6%)	9,171 (11.8%)	11,159 (10.8%)
Neurological	2,722 (4.3%)	3,214 (4.1%)	4,267 (4.1%)
Count of Charlson comorbidities (#)	5.0 ± 2.6	5.5 ± 2.7	5.8 ± 2.8
Select comorbidities[a] (%)			
CHF	27,849 (43.9%)	35,119 (45.2%)	47,978 (46.4%)
COPD	30,166 (47.6%)	37,260 (47.9%)	51,318 (49.6%)
Diabetes	19,527 (30.8%)	26,072 (33.6%)	36,479 (35.3%)
Cancer	7,979 (12.6%)	10,709 (13.8%)	14,838 (14.3%)
Mechanical ventilation (%)			
None	30,095 (47.5%)	39,856 (51.3%)	50,859 (49.2%)
At originating hospital only	22,930 (36.2%)	21,881 (28.2%)	21,750 (21.0%)
Both hospitals	10,389 (16.4%)	15,984 (20.6%)	30,877 (29.8%)
Sepsis at the originating hospital (%)	24,835 (39.2%)	31,503 (40.5%)	48,081 (46.5%)
ICU length of stay (days)	11 [4–21]	11 [4–22]	11 [5–21]
Hospital length of stay (days)			
Originating hospital	17 [10–28]	17 [10–28]	17 [10–27]
Long-term acute care hospital	24 [13–42]	24 [13–39]	25 [15–35]
Total	45 [29–69]	44 [29–65]	43 [31–60]
Costs (thousands $)[b]			
Originating hospital	29.2 [15.4–53.3]	29.6 [16.1–53.2]	31.5 [17.6–55.3]
Long-term acute care hospital	21.2 [10.0–42.4]	20.4 [10.3–37.0]	23.7 [13.4–40.5]
Total	56.3 [33.2–97.2]	54.9 [34.0–90.4]	60.0 [38.3–95.7]
Long-term acute care outcomes (%)[c]			
Home	20,492 (32.3%)	25,247 (32.5%)	28,340 (27.4%)
SNF/rehab	12,597 (19.9%)	18,956 (24.4%)	36,116 (34.9%)

Variable	**1997 – 2000 (n=63,414)**	**2001 – 2003 (n=77,721)**	**2004 – 2006 (n=103,486)**
Acute care	12,436 (19.6%)	14,839 (19.1%)	14,723 (14.2%)
Dead	17,889 (28.2%)	18,408 (23.7%)	23,773 (23.0%)
One year mortality (%)	32,181 (50.7%)	37,480 (48.2%)	103,486 (52.2%)

Values are mean ± SD, median [IQR] or frequency (percent). Percentages may not add to 100 due to rounding. P-values examining temporal trends <0.001 for all variables in the table.

[a]Comorbidities are not mutually exclusive

[b]All costs are in 2006 dollars.

[c]Excludes patients with unknown discharge destination (n=805, 0.3% of total).

CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; SNF/rehab = skilled nursing facility/rehabilitation hospital.