



Tracking Improvement in the Care of Chronically Ill Patients:

A Dartmouth Atlas Brief on Medicare Beneficiaries Near the End of Life

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For Medicare beneficiaries with chronic illness near the end of life, quality, outcomes, and cost vary markedly across regions and hospitals. The health care delivered to these patients frequently falls short of the care they need and want. These differences are invisible to patients and providers, but have been revealed in a series of reports by the Dartmouth Atlas of Health Care.^{1,2} The problem shown in these analyses is now well recognized: the quality and efficiency of the care patients receive is often determined by the accident of where they live and seek care.

While the Dartmouth Atlas has shown that care has improved since the 1990s,^{2,3} further progress is needed. In early 2012, the Institute of Medicine issued a landmark report on the quality of health care in the United States, *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America*.⁴ The committee found that health care in the U.S. continues to fail on the "...basic dimensions of quality, outcomes, costs, and equity," and advanced the concept of a continuously learning and adaptable health care system.

This Dartmouth Atlas brief and accompanying data release (www.dartmouthatlas.org) demonstrate that improvements in care have occurred rapidly for Medicare patients in their last six months of life. Overall, patients spent fewer days in the hospital and

Table. National trends in selected measures of the care of chronically ill patients near the end of life

Measure	2007	2010	Percent change, 2007 to 2010
Number of deaths among chronically ill patients*	1,159,850	1,107,702	-4.5%
Total Medicare spending (Parts A & B) per patient, last two years of life	\$60,694	\$69,947	15.2%
Hospital utilization, last six months of life			
All hospital days per patient	10.9	9.9	-9.5%
ICU days per patient	3.8	3.9	0.2%
Percent of deaths occurring in hospital	28.1	25.0	-11.0%
Percent of deaths that included an ICU admission	17.6	16.7	-5.5%
Physician utilization, last six months of life			
All physician visits per patient	29.6	29.1	-1.8%
Medical specialist visits per patient	15.1	14.8	-1.7%
Primary care physician visits per patient	12.4	12.2	-1.5%
Percent seeing 10 or more physicians	36.1	42.0	16.5%
Palliative care, last six months of life			
Percent enrolled in hospice	41.9	47.5	13.3%
Hospice days per patient	18.3	21.0	15.0%

*The estimate for 2007 is extrapolated from a 20% sample.

more received hospice services in 2010 compared to 2007. These changes reflect the preferences of most patients to spend their last weeks and months in a home-like environment whenever possible, avoiding procedures that have little chance of improving the quality or length of their lives. But the pace of change varied across hospitals, with some experiencing rapid change while other health systems showed little improvement.

Overall change in care near the end of life

In just three years (2007 to 2010), the use of hospital services in the last six months of life fell significantly (see table), with a 9.5% decrease in hospital days per patient (10.9 to 9.9 days) and an 11% decrease in deaths occurring in the hospital (28.1% to 25.0% of deaths). The percentage of patients enrolled in hospice increased by 13.3% (41.9% to 47.5%) and the average number of hospice days rose by 15% (18.3 to 21 days). The number of days patients spent in intensive care units changed little (3.8 to 3.9 days), but this reflects a leveling off of the rising ICU use seen prior to 2007. Similarly, the number of physician visits was stable (29.6 to 29.1 visits), although these visits were spread over a greater number of doctors. Forty-two percent of patients dying in 2010 saw ten or more different physicians in their last six months of life compared to 36.1% in 2007, a 16.5% increase. Despite the trend toward less hospital care, Medicare spending per patient in the last two years of life rose from \$60,694 to \$69,947, a 15.2% increase during a period when the consumer price index rose only 5.3%.

Change in care near the end of life across academic medical centers

Academic medical centers (AMCs) represent some of the finest health care systems in the country, as measured by reputation, innovation, and teaching. Previous analyses have shown that AMCs differ widely in the patterns of care provided for patients of all ages, including Medicare beneficiaries. Striking variations in end-of-life care have also been described, but that care is changing quickly in many centers. For example, while patients cared for by New York University's Langone Medical Center who died in 2007 spent a relatively high number of days in the hospital in the last six months of life, NYU led AMCs with a 29% decrease (26.9 to 19.1 days) by 2010. Some hospitals with a relatively low number of hospital days reduced them even further; for example, the number of days per patient at Fletcher Allen Health Care in Burlington, Vermont fell about 22%, from 11.0 to 8.6 days. In other AMCs, the number of patient days rose, sometimes dramatically. The number of days increased by 30.8% at the University of California, Irvine, 30.1% at Oregon Health & Science University in Portland, and 28.7% at Parkland Health & Hospital System in Dallas.

The increase in hospice use also occurred unevenly across academic medical centers. The average number of hospice days per patient increased more than 40% in 12 AMCs, including a 55% increase at the Hospital of the University of Pennsylvania in Philadelphia and 50% at Johns Hopkins Hospital in Baltimore. Patients

at six AMCs experienced a more than 20% decline in hospice days, including the University of Mississippi Medical Center in Jackson (-42.7%), Hahnemann University Medical Center in Philadelphia (-34.9%), the University of Arkansas for Medical Sciences in Little Rock (-26.5%), Montefiore Medical Center in the Bronx, New York (-25.9%), the University of Texas Medical Branch Hospitals at Galveston (-22.3%), and Upstate Medical University in Syracuse, New York (-20.5%).

What can we learn from end-of-life care?

For over a decade, Dartmouth Atlas analyses have shown that care for a relatively homogenous population (chronically ill patients near the end of life) varies significantly across regions and hospitals. This report shows rapid improvement in many places, although patients in some hospitals continue to receive more aggressive and less palliative care than others. The reasons for the differences in the pace of change are not well understood. Still, tracking care helps inform health systems, patients, and policymakers about patterns of care that can be invisible “on the ground.”

Often the care that patients receive, both at the end of life and when less ill, is not the care that informed patients and families would choose.⁵ Documenting patterns of care helps to keep the spotlight on health care systems that need to change, and those that are changing, but with varying degrees of speed and success.

End-of-life care analyses also reveal important information about the relative efficiency of care. The care that patients with chronic illness receive in a particular region or hospital correlates with the care provided generally for Medicare beneficiaries.⁶ Studies show that more spending, more days in the hospital, and more physician visits are not always associated with better outcomes or with the care that patients want.^{7,8} Less intensive and expensive care can both save money and improve quality, satisfaction, and outcomes for many Medicare beneficiaries.



The Dartmouth Atlas Project works to accurately describe how medical resources are distributed and used in the United States. The project offers comprehensive information and analysis about national, regional, and local markets, as well as individual hospitals and their affiliated physicians, in order to provide a basis for improving health and health systems. Through this analysis, the project has demonstrated glaring variations in how health care is delivered across the United States.

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The Dartmouth Atlas

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