Evaluating the Efficiency of California Providers in Caring for Patients with Chronic Illness

John E. Wennberg, MD, MPH
Director, Center for the Evaluative Clinical Sciences
Dartmouth Medical School
(603) 650-1684
E-Mail: john.wennberg@Dartmouth.edu

Elliott S. Fisher, MD, MPH
Co-Director, VA Outcomes Group, White River Junction, VT
Professor of Medicine and of Community and Family Medicine
Dartmouth Medical School
(603) 650-1822
E-Mail: elliott.fisher@Dartmouth.edu

Laurence Baker, PhD
Associate Professor of Health Services Research and Policy
Stanford University School of Medicine
(650) 723-4098
E-Mail: laurence.baker@stanford.edu

Sandra M. Sharp, SM
Research Associate
Dartmouth Medical School
(603) 650-1250
E-Mail: sandra.sharp@dartmouth.edu

Kristen K. Bronner, MA
Research Associate
Dartmouth Medical School
(603) 650-1762
E-Mail: kristen.bronner@dartmouth.edu

September 30, 2005

[6,495 = 5,391 body text + 1,104 notes text]
Abstract (96 words)

In this paper, we compare the relative efficiency of health care providers in managing patients with severe chronic illness over fixed periods of time. To minimize the contribution of differences in severity of illness to differences in care management, we evaluate performance over fixed intervals prior to death for patients who died over a five-year period, 1999-2003. Medicare spending, hospital bed and FTE physician inputs and utilization vary extensively between regions, among hospitals located within a given region and among hospitals belonging to a given hospital system. The data point to important opportunities to improve efficiency.
Introduction

Widespread concern about the quality and cost of medical care has spurred public and private sector efforts to measure performance of individual physicians, medical groups, hospitals, nursing homes and health plans. Currently available performance measures, however, are limited in their scope. Most focus on the technical processes of care, in particular the underuse of effective care such as indicated screening tests in diabetics. Others include reports on patients’ experiences of care, structural indicators and outcome measures such as risk-adjusted mortality following AMI. Virtually none address on a per person basis the amount of money spent, resources used and services provided over fixed intervals of time for similarly ill patients. In the absence of such population-based measures, payer efforts to improve efficiency have been based on severity-adjusted unit price of services (for example, Medicare’s DRG-based payable inpatient stay charges). This is unfortunate because most of the more than two-fold difference across U.S. regions in per capita spending for Medicare enrollees is due to differences in resource inputs - physicians and hospital resources per capita - and associated use of services, in particular the per-person frequency of physician visits and use.
of the hospital as a site of care among patients with chronic illness.\(^1\)

Evidence at the regional level suggests that greater spending, more resource inputs and more frequent use of hospitals and physician services is not associated with either better performance on technical measures of the processes of care\(^2\) or improvements in survival, functional status or satisfaction with care\(^3\). A related study found no evidence that more care results in better quality or survival among patients cared for by academic medical centers.\(^4\) This research suggests that low spending/low resource/low utilization regions or hospitals are more efficient in managing chronic illness than those providing more care, and their longitudinal performance measures could serve as benchmarks for evaluating relative efficiency, provided that spending, resource input and utilization measures are adequately adjusted for case mix and disease severity and that available measures of quality are satisfactory.

We recently described a method of using Medicare claims data to create longitudinal performance measures for cohorts of patients with severe chronic illness according to the hospital (and associated physicians) from which they receive most of their care.\(^5\) The measures are population-based and include Medicare spending, resource inputs (hospital and ICU beds and FTE
physician labor) and frequency of use of hospitals, ICUs and physician services. In order to minimize the possibility that variation in performance could be explained by differences among patients, the measures were adjusted for age, sex, race and relative frequency of specific chronic illnesses. Moreover, the measures were restricted to six-month intervals over the two-year period prior to death, assuring that the populations assigned to hospitals had identical prognoses.

Publication of this report coincides with the public release of these measures on the Dartmouth Atlas website for California hospitals over the five-year period from 1999-2003. In this paper, we provide an overview of our method, illustrate why longitudinal population-based, hospital-specific measures are important and use our data to evaluate the relative efficiency of selected California regions, hospitals and hospital systems.

Study Populations and Methods

The Database

The primary database is four CMS research files for traditional (fee-for-service) Medicare: the MedPAR file; the Medicare Part B
file (a 20% sample); the Outpatient file; and the Denominator file that contains demographic data and date of death.

Study Populations

We used claims data for Medicare beneficiaries who died over the five-year period from 1999-2003 and who were hospitalized at least once during the last two years of life. We further restricted the analysis to patients who had one or more of 12 chronic illnesses associated with a high probability of death. Claims data were used to assign each patient to the hospital the patient used most often during the last two years of life. In the case of a tie, patients were assigned to the hospital associated with the discharge closest to date of death. The assignment of patients to hospitals is robust because most patients with serious chronic illnesses use the same hospital for most of their care, as shown elsewhere. Population-based rates, however, were calculated based on the total experience of the population over the given period of time, not only from the care received at the assigned hospital or physicians associated with that hospital. The regional analyses include patients who were residents of a given region at the time of death; the hospital-specific analyses are restricted to hospitals with 400 or more deaths during the five-year study period. Data are
available for all hospitals with 80 or more deaths during the study period on the Dartmouth Atlas website.

Measures of Spending

Inpatient reimbursements were calculated by summing Medicare reimbursements from the MedPAR record and reflect total reimbursements, including indirect costs for medical education, disproportionate share payments and outlier payments. Part B payments were for all services included in the Part B Physician Supplier file. Inpatient reimbursements and Part B payments were measured as spending per decedent.

Measures of Resource Inputs

Measures of resource inputs include physician labor, hospital beds, ICU beds and Medicare program spending (reimbursements), presented here as summary measures over the last two years of life. Bed input rates were calculated by summing patient days and dividing by 365. Physician labor inputs were measured by summing the work relative value units (RVUs) on a specialty-specific basis and dividing by the average annual number of work RVUs produced by that specialty. The measure is used to estimate the standardized full-time equivalent (FTE) physician
labor input. Both bed and FTE physician resources are expressed as inputs per 1,000 decedents.

Measures of Utilization

The measures of utilization are for inpatient care and physician services. We calculated hospital days, intensive care unit days, and physician visits (overall and separately for primary care physicians and medical specialists) for each patient over the last six months of life. The measures of utilization — patient days in hospital, patient days in intensive care units and physician visits — are traditional epidemiologic, population-based rates of events occurring over a designated period of time. Although utilization rates were calculated on the total experience of the cohort, the proportion of total care provided by the assigned hospital is high, so the variations in utilization among hospital cohorts primarily reflect clinical choices made by the associated physicians.

Quality of Care Indicators

Two claims-based quality of care measures were used. The percent of patients seeing ten or more physicians is a measure
of the propensity to refer patients. The inverse correlation between this measure and use of effective care (e.g., beta-blockers after heart attacks) suggests that when many physicians become involved, care management becomes less effective. The percent of deaths occurring during a hospitalization that involved one or more stays in an ICU is an indicator of the aggressiveness with which terminal patients were treated. In light of the evidence that more aggressive care in managing patient populations with chronic illness does not lead to longer length of life or improved quality of life, higher scores on this measure can be viewed as an indicator of lower quality of death.

We also report quality measures regarding the processes of care, specifically the underuse of effective care derived from the consensus measure set of the Hospital Quality Alliance (HQA), the first initiative to routinely report data on U.S. hospitals nationally. Data are posted on the CMS website. We provide summary scores on five measures for managing acute myocardial infarction (AMI); two for congestive heart failure (CHF); and three for pneumonia, for all reporting hospitals located within each HRR. For individual hospitals, summary scores are based on measures for which there are 25 or more eligible patients.
To examine patient assessment of the quality of hospital care, we used results from the 2004 California Hospital Experience Survey. The survey asked 36,000 patients treated at 200 California hospitals to rate their hospital experience along several dimensions, including respect for patient preferences, coordination of care, and the involvement of family and friends. Scores on each dimension were then combined to develop an overall patient experience score and hospitals were rated as below average, average and above average, depending on how their scores compared to the California statewide average. For individual hospitals, we report this rating; for regions, we report the percent of hospitals located within that region that patients rated above and below average.  

Statistical methods

We compared measures of Medicare spending, resource inputs, utilization and quality at fixed intervals prior to death among geographic regions and among hospitals in California. All spending, resource input and utilization measures were further adjusted for differences in age, sex, race and the relative predominance of the 12 chronic conditions, using ordinary least squares for Medicare spending variables and over-dispersed
Poisson regression models for all other variables; 95th percentile confidence limits were calculated for all variables. The HQA technical process quality of care measures were not adjusted for differences in case mix among hospitals, as they are specifically restricted to those patients eligible for the specific treatment and do not, therefore, need adjustment. The patient experience measures were adjusted for case mix differences, as described elsewhere.\textsuperscript{10}

Results

The Importance of Longitudinal Population-Based, Hospital-Specific Performance Measures

\textbf{Per capita Medicare spending} The per capita cost of medical care over time is a function of the per capita volume and the per unit price of care: cost per capita = units of care per capita X cost per unit of care. In the absence of population-based information on volume, the evaluation of efficiency has had to rely on cost per unit of care. The importance of taking both per capita volume and the unit price of care into account is underscored in Exhibit 1. The exhibit examines the association between reimbursements per person over time for inpatient care
and the volume of hospital care provided during the same time period, measured by hospital days per person. Among the 226 California hospitals with more than 400 deaths, per person spending in the last two years of life ranged from less than $20,000 to almost $90,000. Two-thirds of the variation in per person spending, measured by the R² statistic, was associated with variation in hospital days per person. Only 39% of the variation was associated with price per day (data not shown).¹¹

The hospital level of population aggregation Exhibit 2 illustrates the importance of aggregating chronically ill patient populations according to the hospital they most often use. Age, race, sex, socioeconomic status and medical condition are associated to a varying degree with the hospitalization rate; on average, during the last six months of life, younger Medicare patients spent 1.49 times more days in hospital than older patients; blacks 1.20 times more than non-blacks; males 1.07 times more days than females; patients with lower economic status (indicated by Medicaid buy-in) 1.06 times more than all others; and congestive heart failure patients slightly more (1.02 times) than cancer patients. However, the range of variation according to hospital most often used is substantially greater for each subgroup. For example, while younger patients
are hospitalized 1.49 times more often than older patients, patient day rates for both groups vary more than three-fold among the hospitals; moreover, the rates for older and younger patients are highly correlated ($R^2 = .78$), indicating that the relative variation associated with hospital is consistent across age categories. While on average, blacks spent 1.20 times more days in hospital, patient day rates for both black and non-black patients varied substantially. Blacks using the highest-rate hospital spent 2.66 times more days in hospitals than they did in the lowest rate hospital; for non-blacks, the ratio was 2.40. Again, hospitals with high rates for blacks had high rates for non-blacks (and vice versa) as evidenced by the high $R^2$ (.79). Similar patterns are evident for subgroups defined by sex, economic status and medical condition.

Exhibit 2 also provides evidence that the hospital effect is independent of severity of illness. During the last six months of life (when acuity of illness for the cohort was extreme), patients spent on average 5.32 times as many days in hospital than they did during the 19th - 24th months prior to death (when acuity was less). However, during each interval of time prior to death, days in hospital varied almost four-fold; and the rates were highly correlated ($R^2 = .74$). Similar effects were seen for physician visits (data not shown).
Benchmarking Relative Efficiency in Managing Chronic Illness

Among selected California regions

This section compares Medicare spending, resource input utilization and quality measures for Medicare decedents with chronic illness in four California regions: Los Angeles, San Francisco, San Diego and Sacramento (Exhibit 3). On the basis of its lower spending, lower resource inputs and utilization rates, and relatively satisfactory quality measures, we selected the Sacramento region as the regional benchmark for relative efficiency.

Medicare spending Spending for physician services over the last two years of life was 1.74 times greater in the Los Angeles region; 1.09 times greater in San Francisco; and 1.29 times greater in San Diego than Sacramento. Inpatient reimbursements were 1.67, 1.39 and 1.16 times greater than the Sacramento benchmark, respectively. By contrast, inpatient reimbursements per day in hospital were about the same in the Los Angeles, San Diego and Sacramento regions, while in the San Francisco region reimbursements per day exceeded Sacramento by a factor of 1.16.
Resource inputs Providers serving the Sacramento region used consistently fewer resource inputs for hospital and intensive care beds and FTE physicians per 1,000 than Los Angeles, San Francisco and San Diego. The greatest contrast was with the Los Angeles region whose providers used 1.61 times more hospital beds, 2.28 times more ICU beds and 1.89 times more physicians in caring for chronically ill patients during the last two years of life.

Utilization During the last six months of life, patients living in Los Angeles spent 1.62 times more days in hospital and 2.31 times more days in intensive care units, and visited their physicians 2.34 times more often than their counterparts living in Sacramento. Rates for these services were also higher in San Francisco and San Diego than Sacramento. Residents of Los Angeles were much more likely to experience a “high tech” death: 33% of decedents died during a hospitalization that included a stay in ICU, compared to 19% of decedents in Sacramento. During the last six months of life, those who resided in Los Angeles were much more likely to be referred to other physicians, with 43.1% seeing ten or more physicians, while only 26.4% of those in Sacramento saw that many different physicians.
Quality The CMS quality measures indicated relatively lower scores for hospitals serving the Los Angeles and San Diego region than for Sacramento and San Francisco; 57% of surveyed hospitals located in the Los Angeles region were rated as below average by the patients using them, compared to 13% and 9% of hospitals in the Sacramento and San Francisco regions, respectively.

Among Los Angeles hospitals

Although the Los Angeles region is noted for high intensity care, there was considerable variation among Los Angeles hospitals in their management of patients with chronic illness and the quality of care (Exhibits 4, 5 and 6). However, per person Medicare spending, resource inputs and utilization in every Los Angeles hospital listed in the exhibits exceeded the Sacramento regional benchmark, with the exception of the inpatient price variable (average reimbursements per day in hospital).

Medicare Spending Among the 28 hospitals listed in Exhibit 4, Medicare spending during the last two years of life varied by a
factor of 2.76, from $38,567 at Foothill Presbyterian Hospital to $106,254 at Garfield Medical Center. While every Los Angeles hospital exceed the Sacramento benchmark for inpatient reimbursements per decedent, unit price (measured by reimbursements per day in hospital) exceeded the benchmark in only nine of the 28 hospitals. The spending profiles of these hospitals further illustrate the importance of taking both volume and price into account. For example, inpatient spending rates at the most costly hospital, Garfield Medical Center, exceeded the Sacramento benchmark by a factor of 3.40, achieved because reimbursements per day were 1.68 times higher and patient day rates (data not shown) were 2.02 times higher than the benchmark. By contrast, price per day at Saint Mary Medical Center was lower than the benchmark (0.91), even though per capita spending was 1.78 times higher because of high volume; over the last two years of life, patient days per decedent were 1.96 times that of the Sacramento region.

Resource inputs While Los Angeles hospitals used more hospital and intensive care beds and more physicians per 1,000 decedents than the Sacramento benchmark, there was striking variation among the 28 hospitals listed in Exhibit 4. Hospital bed inputs varied from 62.0 to 110.6 per 1,000; ICU beds from 17.5 to 50.4
per 1,000 and FTE physician labor inputs from 27.7 per 1,000 to 57.6 per 1,000.

Utilization of care  The contrasting patterns of care between the Sacramento benchmark and Los Angeles hospitals are quite striking. In managing chronic illness at the end of life, providers serving Los Angeles rely much more on inpatient care, on aggressive use of intensive care units and medical specialists, and frequent referrals; while care in the Sacramento region is characterized by greater reliance on primary care, parsimonious use of inpatient care, physician visits and referrals. Yet there is considerable variation among Los Angeles hospitals in care intensity (Exhibit 5). During the last six months, patient days per decedent varied by a factor of 1.85 (12.7 to 23.5 days), and days spent in intensive care unit per decedent varied by a factor of 2.84 (4.0 to 11.4); the frequency of physician visits varied by a factor of 2.34 (39.7 to 92.8 per decedent). Our measure of propensity for multiple referrals, the percent of patients who saw ten or more physicians, varied by a factor of 2.06, from 28.0% to 57.7% of decedents. Finally, the percent of patients who died during a hospitalization that included an admission to intensive care
(our measure of relative aggressiveness of terminal care) varied by a factor of 2.32, from 21.6% to 50% of decedents.

Evaluating Performance Within California Hospital Systems

Over the past decade or so, many U.S. hospitals have merged, been purchased or otherwise become associated with multiple hospitals to form “hospital systems”. Many of these systems describe themselves as integrated health care systems. These hospital networks seem a logical place to seek accountability for resource allocation and for developing and implementing population-based approaches for managing chronic illness.

Among large systems In California, we found considerable within system variation. Appendix Figure 1 illustrates variation among the three hospital systems with more than 20 hospitals in California. Medicare inpatient spending over the last two years of life varied by a factor of 2.17 among hospitals belonging to the Sutter Health system; by a factor of 2.72 among Catholic Healthcare West; and by a factor of 3.54 among Tenet hospitals located in California. The system-wide average for Sutter was $30,814; $29,802 for Catholic Healthcare West; and $46,323 for
the Tenet hospital system. Appendix Figure 1 shows that variation was also great for hospital days, days in intensive care and physician visits per decedent.

Among the University of California Hospital System The hospitals within the University of California system enjoy strong reputations for high quality of care. For example, on the 2001 US News & World Report list of hospitals with excellence in geriatric care, UCLA ranked first in the nation and UCSF ranked 18th. Exhibit 7 provides estimates of Medicare spending and resource inputs over the last two years of life according to hospital cohort. Medicare spending for inpatient care varied from $42,600 per decedent at UCSD to $57,700 at UCLA; Part B payments varied from $7,300 per decedent at UC Davis to $14,200 at UCLA. UC Davis used the fewest acute care beds (54.9 beds per 1,000); UCLA used the most (93.5). UCSF used the fewest ICU beds (12.2); UCLA used the most (50.4). Physician labor input varied both in per capita amounts and in the mix between primary care and medical specialists, reflecting the specialty-oriented practices at UCLA and UC Irvine and the primary care orientation at UCSF and UC Davis.

Exhibit 7 also compares utilization rates during the last six months of life. The most striking differences are those between
UCSF and UCLA. UCLA, like many other hospitals in the Los Angeles region, managed chronic illness aggressively: compared to UCSF, the population receiving care from UCLA spent 45% more days in acute care hospitals, used 3.49 times more days in intensive care and were 1.53 times more likely to have a terminal ICU stay. They experienced 1.71 times more physician visits and more frequent referrals (the percent of decedents seeing ten or more physicians was 1.37 times greater). The ratio of medical specialist visits to primary care visits was 2.86; by contrast, UCSF's ratio was 0.68. While the two hospitals have similar scores on technical processes of care, UCSF is rated above average by its patients, while UCLA is rated average.

California Hospitals and Hospital Referral Regions

Performance measures for California HRRs (including 95th percentile confidence intervals) are available on the Dartmouth Atlas website.¹³ Inpatient measures are reported for hospitals with more than 80 deaths; physician measures are available for hospitals with at least 400 deaths.
Discussion

In this article we used Medicare claims data to develop population-based, hospital-specific measures of Medicare spending, resource inputs and utilization of care over fixed intervals of time for patients with severe chronic illness. The importance of population-based measures was illustrated by showing that per person spending over the last two years of life is determined more by the volume of services (patient days per decedent) than by the price per unit of service (average reimbursements per day in hospital). We also demonstrated the importance of comparing performance at the hospital level of population aggregation. The hospital effect on utilization among California hospitals is ubiquitous across demographic factors, socioeconomic status, category of illness and severity of illness (the latter illustrated by the striking correlations between utilization rates for the last six months of life and rates for the 19th-24th months prior to death).

Our concept of evaluating relative efficiency is based upon the notion of benchmarking: a comparison across regions and hospitals based on spending, resource input and utilization measures and available quality measures. In the example presented here, we first compared population-based measures at
the regional level; on the basis of its pattern of low spending/low resource use/low utilization and relatively high quality measures, we selected Sacramento region as the benchmark for evaluating three other California regions, including the high spending/high resource use/high utilization and relatively low quality Los Angeles region. We then applied the Sacramento regional benchmark to evaluate selected Angeles hospitals. With the exception of inpatient price of care, each hospital exceeded the Sacramento benchmark for every spending, resource input and utilization measure, even while there were wide variations among the hospitals. Although some might argue that evidence-based specification of the proper processes of care is required to identify efficient practices, scientifically valid, detailed evidence defining efficient clinical pathways – for example, whom to hospitalize, when to schedule a revisit, or when to refer to a medical specialist, home health agency or hospice – simply doesn’t exist. It will take a long time and a major reorientation of the academic research agenda to provide such clinical evidence, if indeed it is ever possible to do so. In the meantime, we argue that the results of natural experiments – population-based studies comparing overall quality and outcomes for similarly ill patients exposed to different levels of care intensity – be used to establish benchmarks of relative
efficiency. So far, these studies indicate no marginal gain from greater resource use across the range of practice observed within the United States. For this reason, we believe that the Sacramento region provides a fair benchmark for evaluating performance.

Our evaluation of performance involves three categories: relative spending, resource inputs and utilization. While some may prefer the bottom line per person spending over fixed intervals of time as the gold standard, per capita spending involves price and price does not necessarily correspond to a hospital’s actual cost of producing care. Cost shifting between service lines and among payers, variations among hospitals in proportion of patients with “outlier” payment status, and Medicare policies related to subsidies for indirect medical education and “disproportionate share” payments\textsuperscript{14} distort price as an accurate summary measure for resource inputs per unit of care or per person over time. By contrast, (in the absence of fraudulent billing) the claims-based measures of resource inputs – hospital beds, ICU beds, and FTE physicians per capita – estimate real differences in the amount of resources allocated to care for similarly ill patients among hospitals (as well as regions). Our measures of FTE physician by specialty also address a different aspect of the efficiency problem, namely the
number allocated and the mix among specialties. Our measures of utilization allow for the characterization of relative intensity of specific forms of care, including treatment of the terminally ill and the propensity to refer. Taken together, the measures provide a useful characterization of hospital-specific efficiency. For example, while per person spending for inpatient and Part B care over the last two years of life among patients receiving most of their care from UCLA hospital was only 1.26 times greater than for UCSF, UCLA used many more “real” resources in managing care: 1.66 times more physicians and 4.14 times more ICU beds per capita. Clinicians associated with UCLA also treated their chronically ill patients much more aggressively: 35% of deaths involved a stay in an ICU compared to 23% for UCSF. The UCLA pattern of practice depended much more on medical specialty care than UCSF, which emphasized primary care (Exhibit 7).

Certain limitations of our measures need to be mentioned. Our utilization measures only cover experience during the last six months of life. This is by design: we believe that variations during this period of time periods are not likely explained by differences in severity of illness. Moreover, the hospital-specific performance documented during this period of life is indicative of relative performance in managing chronic illness
over longer periods of time, as shown by the high correlation with utilization rates observed in previous periods for the same patient cohort (Exhibit 2). Certain limitations related to the availability of claims data also need to be recognized: the measures of physician performance are based on a 20% sample of physician claims and there is an 18-month time delay between date of utilization and availability of the research claims for analysis. These limitations could be reduced by change in CMS policy.

Finally, our measures do not address what is happening to patients under 65 years of age. There is evidence that the variation in hospitalization rates seen for Medicare is highly correlated with variation for other insured populations for chronic medical conditions. There is also evidence that volume of care accounts for most of the regional variation in cost per capita among commercial populations.\textsuperscript{15} However, a hospital’s ranking in terms of per capita spending may vary substantially for commercial payers based on market-negotiated (rather than CMS-set) unit prices and the greater spending on non-chronic conditions such as pregnancy. We therefore cannot be confident that the association between per capita reimbursements and unit price of care seen in Medicare will accurately predict the relationships among other payers. The best strategy for
addressing these limitations would be for all payers and self-insured employers to work together to produce resource input and utilization data for cohorts across Medicare, Medicaid and commercially insured patients. The recently announced partnership between CalPERS and the Pacific Business Group on Health to build stakeholder consensus on a standard set of metrics for evaluating hospital efficiency of California hospitals is a very encouraging development.

The availability of information on relative efficiency in managing chronic illness by specific providers could stimulate major employers and payers to use data to direct their chronic disease populations away from high cost, high utilization hospitals to those that spend less and use less resources. The information should promote the profitability of those health plans participating in Medicare Advantage that can redirect their patients to physician groups using hospitals with spending levels below the regional reimbursement average CMS uses to calculate payment to health plans. After commercial insurers and self-insured employers have substituted commercially negotiated unit prices into such analysis, changes in provider network composition and/or incentives for chronically ill patients to choose efficient providers should result in net savings for employers and payers. The potential savings in some
markets are quite large. For example, over the five-year period of this study, had the per person level of Medicare spending during the last two years of life for inpatient care and Part B in Los Angeles been equal to the amount predicted by the Sacramento benchmark, Medicare would have saved 1.7 billion dollars.\textsuperscript{16}

Simply steering patients to low cost providers, however, would result in little improvement in quality or system efficiency beyond that achieved by reduction in overuse of supply-sensitive care among those who change providers. Ironically, traditional Medicare, unless it too can join in directing patients to efficient providers, stands to lose; if Medicare Advantage Plans, other commercial payers and self-insured employers steer patients away from high resource/high volume providers, the populations loyal to high cost providers will shrink, but the available resources will not, presumably resulting in yet higher utilization rates and higher costs and possible worse outcomes among those chronically ill patients who remain loyal to such providers.

Chronically ill Americans need a fundamental redesign of care, shifting resources from the overused acute care sector to the now underfunded infrastructures of care for the management of
patient populations. But achieving a significant redesign requires new economic arrangements that pay for performance that actually (demonstrably) improves system-wide efficiency – that reward, rather than penalize, provider organizations that successfully reduce over-reliance on acute hospital care and develop population-based strategies for managing their patients with chronic illness. Under current fee-for-service – and most forms of primary care capitation – the savings generated by effective population-based management of chronic care are returned to the payer, not to the provider. Under these financial arrangements, health care providers that implement “best practice” models lose twice; important aspects of the infrastructure of care go uncompensated, and reductions in acute inpatient care result in loss of revenue. What is needed is a financial plan that would share savings among payers and providers, after paying for the real costs of reducing capacity (for example, the loss of revenue targeted to amortize debt) and the cost of care under the population-based model for managing chronic illness.

CMS is already moving to develop new strategies for promoting improved management of chronic illness. The Medicare Modernization Act directs CMS to pay all hospitals based on resources needed for “efficient care”. We believe our measures
of spending, resource input and utilization may be of use in pursuing this goal. Potentially the most flexible and innovative approach from the provider perspective is Medicare’s Health Care Quality Demonstration Programs (HCQDP) authorized under Section 646 of the Medicare Modernization Act. Regardless of the approach taken to address the overuse of care in managing chronic illness and the deficiencies in quality apparent in the delivery system, reducing excess acute care capacity carries some risks as well as benefits. The potential adverse consequences include loss of employment in health care, lowered hospital revenues that could affect both bond and equity markets17 and worsening of access to care for the uninsured if safety net hospitals are not protected. They could also include worse health outcomes, if the reductions in inpatient care are not associated with improvements that reduce the underuse of effective care and if there is no coordination and integration of care among other sectors of care involved in managing chronic illness --for example home health and hospice care. Every community will have its own set of problems and its own potential for creative redesign. This is why flexibility in the methods of financing is so critical to genuine reform. These concerns also underscore the importance of ongoing performance monitoring of the health care system as change is implemented.
Only then will we be able to learn what approaches to reform are most effective.
ENDNOTES


The five performance measures for acute myocardial infarction are the percent of eligible patients receiving (1) aspirin at time of admission; (2) aspirin at time of discharge; (3) ACE inhibitor for left ventricular dysfunction; (4) beta blocker at admission; and (5) beta blocker at discharge. The two congestive heart failure measures are percent of patients with (1) assessment of left ventricular function and (2) ACE inhibitor for left ventricular dysfunction. For pneumonia, the three measures are percent of patients with (1) oxygenation assessment; (2) pneumococcal vaccination; and (3) timing of initial antibiotic therapy. The summary scores are equally weighted average for the items in each category. Hospital-specific summary scores are given only for those hospitals for which 4 of the 5 heart attack and all of the congestive heart failure and pneumonia measures were based on 25 or more patients. See A.K. Jha, Z. Li, E.J. Orav, and A.M. Epstein, “Care in U.S. Hospitals--the Hospital Quality Alliance program”,

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Regional scores in this study are based on the average for each measure, obtained by summing numerator and denominator information across all reporting hospitals.


For each hospital, we computed the implied price per day by dividing total reimbursements by total days spent in hospital.

The differences in inpatient spending among the regions are not explained by differences in hourly wages for hospital workers. For example, the average hourly wage index (2003-2005) in Los Angeles was $33.0239; in San Diego, Sacramento and San Francisco it was $31,940, $36,361 and $41,933, respectively.


For example, among the five University of California hospitals, outlier payments varied substantially as a percent of total payments: from 8% of total at UC San Diego to 27% at UC Davis. Supplements for indirect medical education (IME) varied from 10% at UC Irvine to 20% at UCSF. The disproportionate share (DS) supplement varied from 9% at UCLA to 16% at UC Irvine; net inpatient reimbursements per decedent over the last 2 years of life (total - disproportionate share + IME) for 1999-2003 at UC San Diego was $30,600; at UCSF, $32,100; at UC Davis $33,300; at UC-Irvine $38,000 and at UCLA, $42,700.

To estimate potential savings, we first multiplied the spending rate in Sacramento for inpatient and Part B services (Exhibit 3) by the number of deaths occurring in Los Angeles to predict total spending for Los Angeles if the Sacramento
benchmark had applied; savings were then calculated by subtracting predicted spending from actual spending.

17 The evidence for over capacity in acute sector care resources, more so in some hospitals and communities than in others, has yet to be taken into account by Wall Street in evaluating the financial prospects of hospitals. The situation in Los Angeles is particularly interesting because of the requirement that existing hospitals be rebuilt or otherwise reconstructed to meet new standards for withstanding earthquakes. The recovery of investments to rebuild Los Angeles hospitals at their present level of capacity will depend in a significant way on the willingness of Medicare to continue to subsidize current inefficiencies in high resourced-high utilization hospitals and regions. Recent CMS initiatives to promote efficiency in chronic disease management suggest a changing posture.