

MEASURING COSTS OF CARE: A PROMISING STRATEGY FOR EPISODE-BASED MEASUREMENT

The United States spends significantly more per person on health care than any other nation in the world. The cost of health care can vary significantly for a number of reasons — such as variations in spending by region and by provider, and also the severity of the condition or the patient’s treatment preferences. All of these factors can make it difficult not only to measure the costs of health care services, but also to understand the relationship between spending and clinical quality and outcomes. To gain a better understanding of these issues, health care costs and quality must be measured in a uniform manner.¹

This issue brief provides information on a new effort to develop a “starter set” of cost-of-care measures as part of the broader High-Value Health Care Project. The process of developing these measures builds on lessons from previous efforts to measure the costs of care.

MEASURING COSTS OF CARE: PER-CAPITA OR PER-EPISODE

A comprehensive, consensus-based, and nationally consistent method for measuring health care costs currently does not exist. While aggregate, system-level statistics are widely available, more granular and actionable metrics are less common.¹

Cost-of-care is presently measured in one of two ways: per-capita measurement and per-episode measurement. Per-capita measurement involves capturing all of the health care costs for a given population. Examples of per-capita measures include those that assess total costs

Getting to a System of High-Value Health Care

The High-Value Health Care (HVHC) Project — directed by the Engelberg Center for Health Care Reform at Brookings and supported by the Robert Wood Johnson Foundation — is working to make valid, timely, and consistent information about the quality and cost of health care widely available in the United States. As part of this effort, the Engelberg Center is developing strategies for combining clinical information with administrative data to provide more valid and comprehensive measures of the quality of care.

Three objectives for these new measures, which would address both internal and external uses of information, will be to:

- Enhance the use of performance measures for quality improvement programs, resulting in higher-quality care;
- Foster development of performance-based reimbursement for individual providers and institutions, providing financial incentives to encourage the best possible care; and
- Improve public transparency about the health care system, not only to allow patients to make better informed decisions about choice of providers or therapies, but also to result in more informed actions by policymakers and regulatory bodies.

per member per month (PMPM), or measures of service utilization per 1,000 people per year. These measures are useful because they can

provide valuable information in a straightforward way and can be calculated for large populations. However, it can be difficult to determine which providers should be held accountable for per-capita measures because they apply at the population level and because many patients see multiple providers for multiple conditions over any given year.² This lack of specificity also makes it more difficult to use the results from some of these measures to identify key opportunities for improving patient care.

Per-episode measurement quantifies the services involved in the diagnosis, management, and treatment of specific clinical conditions. Episode-of-care measures can be developed for the full range of acute and chronic conditions, including diabetes, congestive heart failure, acute myocardial infarction, asthma, low back pain, and many others. Because episodes of care can be defined more tightly and specifically around aspects of a given clinical condition, it may be easier to determine who should be held accountable based on per-episode than on per-capita measurement efforts. While the specificity of per-episode measures may make them less useful for supporting some high-level policy decisions — such as regarding the allocation of population-wide resources — they can be used to identify detailed opportunities for improvement and action. At the same time, the specificity of episode-based measures may limit the volume of patients for whom the results are pertinent, and the complexity of the measures can also make them more difficult to implement or interpret.

Several proprietary approaches for episode-based measures have been developed and implemented in different areas of the country to generate estimates of physician performance based on cost. However, early efforts to implement these tools have experienced limited success.³ Lack of transparency regarding the underlying methods

Measuring 12 High-Cost Conditions

- Acute Myocardial Infarction (AMI)
- Asthma
- Breast Cancer
- Chronic Obstructive Pulmonary Disease (COPD)
- Colon Cancer
- Congestive Heart Failure (CHF)
- Coronary Artery Disease (CAD)
- Diabetes
- Gastroesophageal Reflux Disease (GERD)
- Low Back Pain
- Pneumonia
- Sinusitis

has resulted in limited buy-in from physicians. As a result, the measures are not widely used.

Since the need to reliably measure and evaluate the costs of health care in the United States is undiminished, identifying suitable and valid measurement approaches remains critical. This was the impetus for the HVHC Project's effort to develop and conduct preliminary testing of a set of cost-of-care measures.

CHARACTERIZING EPISODES AND COSTS OF CARE

Over the past two years, the HVHC Project has directly addressed concerns about the transparency of cost-of-care measurement for 12 of the most prevalent and important acute and chronic conditions in the United States, as identified by the AQA.⁴ Through a project component called Characterizing Episodes and Costs of Care (C3), the American Board of Medical Specialties Research and Education Foundation, in conjunction with the Engelberg Center for Health Care Reform at Brookings, developed detailed specifications for 22 episode-based cost-of-care measures that can be calculated using administrative claims data. These measures were shaped by physician experts — who worked in collaboration with other stakeholders — and through a public comment process, making them

the most transparent measures available today for 12 high-cost conditions.

Measure Development Process

For each condition, an expert group of clinicians representing a wide range of relevant specialties and other stakeholders regularly convened to identify a conceptual definition of one or more cost-of-care measures. Key aspects of the definitions included:

- How to identify the target episodes of care using specific criteria;
- Which diagnosis codes, procedure codes, and other codes could be used to identify services that should be characterized as resource use related to the measure; and
- How to construct a testable model for identifying the providers or provider organizations that should be attributed to the episode.

The definitions were subsequently tested and refined through analysis of developed algorithms in a data set representing approximately 15 million patients per year over two years. In developing the measures, it was necessary to address several key challenges related to cost-of-care measurement, including defining accountability, accounting for differences in patient severity, and defining episode-related services.

Defining Accountability. So far it has been difficult to define accountability for episode-based measures in a way that is widely accepted. When quality measures focus only on a particular service, such as whether or not a recommended preventive service was performed, assigning accountability can be relatively straightforward — for example, to the physician(s) with the opportunity to provide that particular service. However, many episodes of

acute and chronic care are defined to track a wide variety of services across different care settings, rendered by multiple providers, and occurring across extended time periods. Therefore, it is not always immediately intuitive how, or to whom, accountability should be assigned.

Table 1 details the 22 measures across 12 conditions that were generated over the course of the project.⁵ It also shows the different levels of accountability — such as individual physician, physician practice group, integrated delivery system, or region — that the clinician work groups recommended.

The clinician work groups generally agreed that individual physician-level accountability appeared justified for many of the conditions. The acute AMI episode and the breast and colon cancer treatment episodes were exceptions. For example, work group members argued that attempting to identify an individual physician responsible for the acute AMI episode would be both technically difficult and not representative of care delivery in acute-care settings. The episode is triggered by a hospital stay for AMI; most hospitals employ large physician teams and any one physician on the team could see a patient on any given day.⁶

Accounting for Differences in Patient Severity.

When confronted with cost-of-care measurement results showing higher than average resource use, physicians might doubt the validity of the results by suggesting, “My patients are sicker.” In order for measures to be accepted by the provider community, physicians must feel confident that the measures adjust for differences in underlying patient severity and risk. C3 project staff accounted for patient severity in two distinct ways.

First, as Table 1 illustrates, two episodes of care were typically developed for each condition.

These two episodes were generally characterized as the stable management of the condition and as an exacerbation or more clinically significant intervention. In this way, patients can be categorized into one of two sub-groups based on the severity of their condition. By both accounting for the total numbers of episodes generated and linking appropriate quality of care measures to episode-of-care measures, it is also possible to better understand, for example, whether the patient's condition worsened because optimal care was not provided.

Second, the number and scope of an individual's co-morbid conditions can also influence costs for any given condition. To adjust for this, project staff developed condition-specific versions of the Centers for Medicare & Medicaid Services' Hierarchical Classification of Conditions (HCC) risk adjustment model in collaboration with clinician work groups. This allowed for the unique relationships between co-morbid conditions, basic patient demographic characteristics, and condition-specific costs for the population evaluated — in this case, a large population of commercially-insured patients.

Defining Episode-Related Costs. For each episode, having identified that the patients in the episode denominator were relatively homogeneous and representative of typical patients experiencing that condition, the clinician work group identified all diagnosis codes, procedure codes, and other codes that might be used in billing for treatment. Throughout the process of empirically testing the measures, clinicians were shown detailed analyses of the composition of each episode by type of service — such as, what proportion of episode costs were associated with inpatient hospital care, outpatient care, ambulatory care, procedures, imaging, tests, and prescription drugs. They were then asked to assess whether the distributions were in line with their clinical expectations for

the condition's treatment. Further, clinicians were presented with diagnosis- and procedure-level details related to each episode in order to ensure that the appropriate services were being captured and grouped to the episodes.

Stakeholder Support Through Transparency. These measures have been developed with significant, detailed input from practicing physicians who represent a range of specialties relevant to each condition. The measure development process involved a series of deliberate steps where participating physicians took into account existing best practices for a condition before carefully considering how best to use administrative claims data to identify individuals with that condition.

Additionally, at all stages of the measure development process, project staff kept key stakeholder groups informed through the Quality Alliance Steering Committee (QASC), providing regular updates and soliciting feedback from a QASC work group, including physicians and representatives from hospitals, health plans, employers, consumers and others.⁷ An advisory team of methodologists, statisticians, economists, and others experts also informed the construction of each episode. Finally, measure specifications were made available online for all interested parties to review.⁵ This level of transparency can bolster multiple stakeholders' confidence in the usefulness of these measures.

CONCLUSION & NEXT STEPS

Until only very recently, tools available to analyze and interpret patterns of resource use and quality of health care were very few and broad, only rarely offering insights into what drives the costs in health care. The HVHC C3 project has demonstrated that it is possible to fill this gap by developing reliable and valid episode-based cost-of-care measures through transparent and collaborative processes.

The 22 measures emerging from this effort represent an important step forward in measuring costs-of-care in a uniform manner, which is critical for successfully identifying and addressing potential sources of unwarranted cost variations.

Efforts are underway to carry out additional, large-scale testing to ensure these measures can be widely used to assess physician performance in tandem with quality measures. Plans call for these measures to be submitted by August 2010 to the National Quality Forum (NQF) for endorsement, which will work to further increase acceptance of cost-of-care measurement efforts among key stakeholder groups.⁸ Further testing should provide insights to additional issues such as:

- Obtaining reliable scores (e.g., ensuring sufficient sample size for the intended unit of accountability);

- Testing how well suggested patient attribution methodologies — that may be characterized by different ways of organizing and delivering care — work in different areas around the country; and
- Refining the proposed risk adjustment model.

Communities interested in testing the measures themselves using local data may obtain the specifications on the QASC website and can begin familiarizing their stakeholders with these measurement concepts. Once cost-of-care and quality measurement together become a key component of health system analysis — within these communities and nationally — we will be able to better understand the growth of health care spending and more effectively target efforts to curtail it.

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 2. Care Patterns in Medicare and Their Implications for Pay for Performance Hoangmai H. Pham, Deborah Schrag, Ann S. O'Malley, Beny Wu, M.S., and Peter B. Bach. The New England Journal of Medicine, Volume 356: 1130-1139, March 15, 2007, Number 11
 3. Lake, T., Colby M., and Peterson, S. Health Plans Use of Physician Resource Use and Quality Measures. Mathematica Policy Research. <http://www.medpac.gov/documents/6355%20MedPAC%20Final%20Report%20with%20Appendices%201-24-08.pdf>. Accessed January 29, 2010.
 4. AQA Alliance. Cost of Care Measures Related to Specific Conditions or Procedures: Proposed “Starter” Set of Conditions and Procedures. Revised June 2009. <http://www.aqaalliance.org/files/CandidateListofConditionsforCostofCareMeasurementApproved.pdf>.
 5. More information, including detailed measure specifications can be found at <http://www.healthqualityalliance.org/hvhc-project/cost-care-measurement-development>.
 6. The breast cancer clinician work group argued that, since the episode of breast cancer treatment would be measured using administrative claims data only (and thus could not rely on clinical indicators the stage of patients' cancers) and because of relatively small sample sizes for this condition, it would be unrealistic to assume that the distribution of cancer stages seen would be comparable across large health care systems, let alone physician groups or individual physicians. The colon cancer work group noted that it would be appropriate to modify the model of attribution depending on the care path followed, since different specialties become more intimately involved and responsible for a patient's care depending on the patient's choice of treatment. For example, following a colectomy, a radiation oncologist may become increasingly involved in a particular patient's care if afterward the patient elects to undergo radiation therapy. As a result, this work group defined a dynamic model of accountability for the colon cancer treatment episode.
 7. Examples of these analyses are available online: <http://www.healthqualityalliance.org/node/191>.
 8. More information on the NQF process for endorsing efficiency measures can be found here: <http://www.qualityforum.org/projects/efficiency.aspx>.

Table 1: Characterizing Episodes and Costs-of-Care (C3) Project: Episode-Based Measures Under Development

#	Condition	Episode-of-Care Measure Name	Level of Accountability
1	Acute Myocardial Infarction	30 Days Following Onset	Hospital
2	Acute Myocardial Infarction	Post-Acute Period (Days 31-365 Days Post-Event)	Individual Physician
3	Asthma	Patients with Asthma over a One-Year Period	Individual Physician
4	Breast Cancer	60-Day Period Preceding Breast Biopsy	Region ⁶
5	Breast Cancer	Treatment in Newly Diagnosed Cases of Breast Cancer over a 15-month Period	Region ⁶
6	Chronic Obstructive Pulmonary Disease (COPD)	Patients with Stable COPD Over a One-Year Period	Individual Physician
7	Chronic Obstructive Pulmonary Disease	Patients with Unstable COPD over a One-Year Period	Individual Physician
8	Colon Cancer	21-Day Period Around Colonoscopy	Individual Physician
9	Colon Cancer	Treatment of Localized Colon Cancer	Up to Two Physicians ⁶
10	Congestive Heart Failure (CHF)	Chronic Management of CHF Over One-Year Period	Individual Physician
11	Congestive Heart Failure	Post Hospitalization Management of CHF over 4-Month Period	Individual Physician
12	Coronary Artery Disease (CAD)	Chronic Management of CAD Over One-Year Period	Individual Physician
13	Coronary Artery Disease	Management of CAD Post Revascularization Over a One-Year Period	Individual Physician
14	Diabetes	Diabetes Over a One-Year Period	Individual Physician
15	Gastroesophageal Reflux Disease (GERD)	12-Month Period of GERD Treatment	Individual Physician
16	Gastroesophageal Reflux Disease	12-Month Period of Hiatal Hernia Treatment	Individual Physician
17	Low Back Pain	Acute/Sub-Acute Lumbar Radiculopathy With or Without Lower Back Pain	Individual Physician
18	Low Back Pain	Simple Non-Specific Lower Back Pain (Acute and Sub-Acute)	Individual Physician
19	Pneumonia	Community-Acquired Pneumonia Hospitalization	Hospital
20	Pneumonia	Ambulatory Pneumonia Episode	Individual Physician
21	Sinusitis	Ambulatory Management Episode of Acute/Acute-Recurrent Sinusitis	Individual Physician
22	Sinusitis	Chronic Sinusitis	Individual Physician