HEALTH CARE INCENTIVES IMPROVEMENT INSTITUTE®
Fair, Evidence-based Solutions. Real and Lasting Change.

The History of the development of the Prometheus Payment model-defined Potentially Avoidable Complications.

In 2006 the Prometheus Payment Design Team convened a series of meetings with physicians that had been organized in Clinical Working Groups. These Groups focused on Cancer, Cardiac, Chronic, Orthopedic and Preventive care. Their task was to select a starter set of episodes (Evidence-informed Case Rates or ECRs) that could be fully defined by the each group, which included:

- selecting clinical practice guidelines for those conditions;
- determining the natural boundaries of the ECR;
- providing a rigorous estimate of the base of the ECR, including the total units of service and the type of provider responsible for delivering those services;
- establishing a reasonable set of performance measures that should be used to evaluate the clinical performance of providers delivering the services included in the ECR;
- identifying routine complications that are prevalent for patients that don't receive optimal care;
- participating in and supervising the data modeling of the ECR to determine the extent to which the results were valid; and
- creating estimates for the warranted variation of services that should be added to the base.

The results of this work were summarized in a Commonwealth Fund report published in June 2007[1] and served as an input to the initial modeling work performed in 2007 and early 2008. Starting with AMI, Hip replacement, Knee replacement, and Diabetes, the objective was to analyze a large claims dataset in order to determine the amount of unexplainable variation in total costs of care that could reasonably be attributed to complications under the control of providers.

The Clinical working groups had acknowledged that there are increases in severity of patients over time that are not caused by provider action or omission, but rather by a

---

[1] See http://www.commonwealthfund.org/~/media/Files/Publications/Fund%20Report/2007/Apr/Evidence%20Informed%20Case%20Rates%20%20A%20New%20Health%20Care%20Payment%20Model/deBrantes_evidence%20informedcaserates_1022%20pdf.pdf

PROMETHEUS Payment®, Evidence-informed Case Rates™, ECR® are registered trademarks of the Health Care Incentives Improvement Institute, Inc. 2009-2010, all rights reserved.

natural deterioration of the organs. As Patrick O'Connor from HealthPartners put it: "Every patient with diabetes eventually dies".

In its work on determining a framework for efficiency, the National Quality Forum[2] also concluded that there are metabolic pathways for certain patients that will simply lead to increase severity of the condition while others will be stabilized. All these frameworks essentially acknowledge the same construct – there are typical sets of services that one expects to observe in the care of a patient at any given time, and these services will vary over time as the patient's condition changes; however there are also non-typical services that occur when "defects" in care occur. We initially termed the first type of variation warranted and the second unwarranted. Subsequently, and in deference to the model developed by Geisinger, we switched the terminology to typical services and services associated to potentially avoidable complications (PACs).

As the data modeling started to yield outputs, it became clear that the current coding practices in hospitals and physician offices allowed us to tag claims and events within a claim that were associated to PACs.

Our starting definition of a PAC was guided by the product of the Clinical Working Groups, and we subsequently used a rather large circle of collaborating organizations throughout the country with whom we interfaced continuously during the development of the methodology (see Appendix A).

At its core, the definition of a PAC is any event that negatively impacts the patient and is controllable by the providers. In its seminal report, To Err is Human, the Institute of Medicine highlighted a significant number of these negative events, including a host of hospital acquired conditions that have since become defined by the CMS[3]. In addition, the AHRQ has used the same research to base its Patient Safety Indicators[4] – any hit in the numerator of those measures is a negative event impacting a patient.

---

[2] See http://www.qualityforum.org/projects/efficiency.aspx
[3] See http://www.cms.hhs.gov/HospitalAcqCond/06_Hospital-Acquired_Conditions.asp#TopOfPage
[4] See http://www.qualityindicators.ahrq.gov/psi_overview.htm

PROMETHEUS Payment®, Evidence-informed Case Rates™, ECR® are registered trademarks of the Health Care Incentives Improvement Institute, Inc. 2009-2010, all rights reserved.

To Err is Human also pointed out that the lack of care coordination for patients with chronic conditions led to a significant number of unnecessary hospitalizations. Work by Wagner and colleagues showed how extensively these hospitalizations could be reduced when care for these patients was optimized. More recently, Jencks[5] and colleagues highlighted the significant number of readmissions that occur post discharge that could be reduced with better transitions in the care of patients.

All these negative events are included in our definitions of Potentially Avoidable Complications. In fact, we have used the specific AHRQ and CMS definitions. Readmissions are easy to account for in an episode when the window of that episode is appropriately set, and we count readmissions as PACs. We summarized our initial modeling work in a Commonwealth Fund report published in June 2008[6]. Subsequently, under a Robert Wood Johnson Foundation grant, we continued to model an increasing number of ECRs through 2008 and 2009, stabilizing the rules and models. At each step we used the circle of clinical advisers to inform the models and validate the findings. Further, our field work in four pilot sites provided us an opportunity to work directly with physicians and hospitals to get input in and feedback on our definitions of PACs.

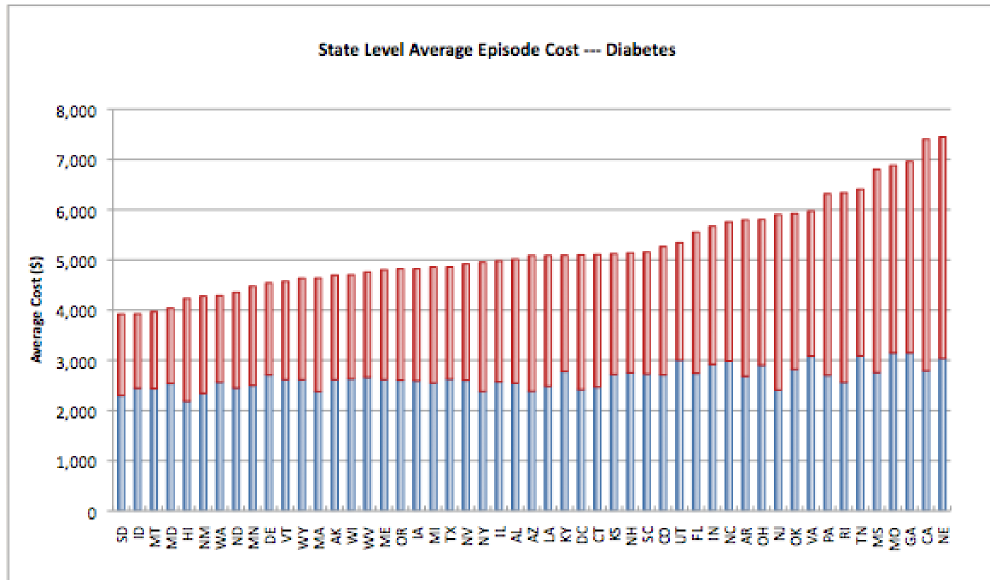
There are essentially two important concepts associated to PACs that providers have wrestled with initially. The first is the tendency for providers to think in absolutes and reject the very notion of personal failure. However, the IOM report cited above taught all of us that to err is indeed human, and that even great people surrounded by great systems will occasionally fail. As such, the purpose of measuring PACs and holding providers accountable for reducing them is not an exercise in reaching zero defects, rather than an exercise in significantly reducing them.[7] The chart below illustrates the extent of the variation that exists in PAC rates across the country (the blue bars represent typical costs

---

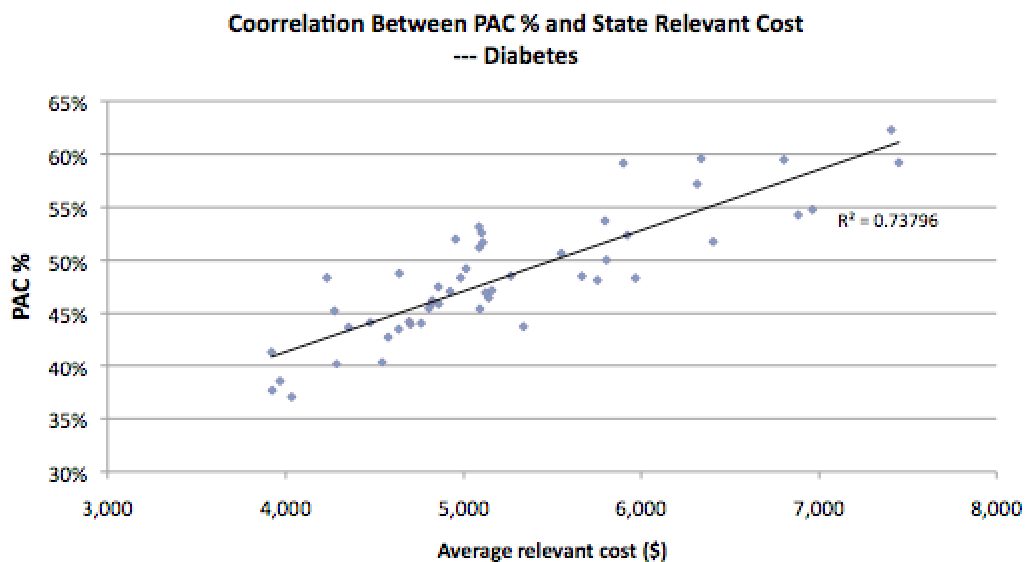
[5] See http://nejm.highwire.org/cgi/content/abstract/360/14/1418
[6] See http://www.commonwealthfund.org/Content/Publications/Issue-Briefs/2008/Jun/Evidence-Informed-Case-Rates--Paying-for-Safer--More-Reliable-Care.aspx
[7] François de Brantes, M.S., M.B.A., Amita Rastogi, M.D., M.H.A., and Michael Painter, J.D., M.D. Reducing Potentially Avoidable Complications in Patients with Chronic Diseases: The Prometheus Payment Approach. Health Services Research Journal, published online July 20 2010 DOI 10.1111/j. 1475-6773.2010.01136.x.

PROMETHEUS Payment®, Evidence-informed Case Rates™, ECR® are registered trademarks of
the Health Care Incentives Improvement Institute, Inc. 2009-2010, all rights reserved.

and the red bars PAC costs), but it also illustrates that some are doing a far better job at managing PACs than others.



And our analysis also suggests that the majority of the variation in total costs can be explained by the variation in PACs. The balance is explainable by the difference in the relative severity of the patients. These two findings are highly consistent with the NQF Framework on Efficiency aforementioned, but also with the findings in the IOM's follow-up report, Crossing the Quality Chasm – defects occur often and they are caused by gaps in the system of care as well as gaps in provider competence.



The second point that individual physicians or hospitals bristle at is the notion that they might be held accountable for failures by providers other than themselves, and yet, fixing that issue was the central theme of Crossing the Quality Chasm, and the purpose of our measurement of PACs across the system that affect the patient is simply an actualization of that report's recommendations on payment policies which stipulated:

> *Aligning payment policies with quality improvement.* Although payment is not the only factor that influences provider and patient behavior, it is an important one. The committee calls for all purchasers, both public and private, to carefully reexamine their payment policies to remove barriers that impede quality improvement and build in stronger incentives for quality enhancement. Clinicians should be adequately compensated for taking good care of all types of patients, neither gaining nor losing financially for caring for sicker patients or those with more complicated conditions. Payment methods also should provide an opportunity for providers to share in the benefits of quality improvement, provide an opportunity for consumers and purchasers to recognize quality differences in health care and direct their decisions accordingly, align financial incentives with the implementation of care processes based on best practices and the achievement of better patient outcomes, and enable providers to coordinate care for patients across settings and over time.[8]

In and of themselves, PACs don't accomplish all the goals in the policy stated above, however, the Prometheus Payment model does by creating an allowance for PACs and adding it to a severity-adjusted typical budget for a patient's medical episode of care. In June 2009[9] we published a paper that showed how severity-adjusting ECRs and adding a PAC allowance (which is also severity-adjusted) creates an incentive to care for sicker patients and enables clinicians that reduce PACs (improve quality) to financially benefit from that improvement.

---

[8] See www.nap.edu/html/**quality_chasm**/reportbrief.pdf
[9] See http://content.healthaffairs.org/cgi/content/full/28/4/w678?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=de+brantes&andorexactfulltext=and&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT

PROMETHEUS Payment®, Evidence-informed Case Rates™, ECR® are registered trademarks of the Health Care Incentives Improvement Institute, Inc. 2009-2010, all rights reserved.

As we continued to review the outputs from modeling ECRs, and refining the models themselves, we created a categorization of PACs by type of ECR which is described below:

Acute medical ECRs – inpatient-based PACs which include HACs and PSIs, and readmissions within 30 days of discharge for the same and related reasons as the initial admission and relevant to the patient's condition. This definition is core to understanding both the intent and function of PACs. In our view (and that of the IOM's and many health care services researchers), a patient with Diabetes that is admitted to the hospital for an AMI, stroke or pneumonia should get treatment and follow-up care not simply for the reason they were admitted, but for anything else that ails them. Today's health care non-system is not accountable for defects that go slightly beyond the scope of the tight intervention. There is no financial downside for the providers when the defects occur, and there are to-date no quality measures that create accountability. Therefore, if a patient with Diabetes who had an AMI is readmitted within 30 days for hypo or hyper-glycema, we consider that a potentially avoidable complication. While the hospital and cardiac surgeons might disagree, any virtual or real system of care would have to agree since they are supposed to be "accountable care organizations" not just around what they do in a tight scope, but in what happens to the patient overall. Our definitions of PACs create the right level of accountability for organizations that would pretend to be ACOs.

Inpatient and outpatient procedures – similar to acute medical events, procedures can lead to two types of potentially avoidable complications, those that occur during the procedure (or during the stay for inpatient procedures) and those that occur post-discharge. In August 2009 we published a paper that summarizes the definitions of PACs for hip and knee replacements[10].

Chronic conditions – generally, any hospitalization related to the patient's core chronic condition or any co-morbidity is considered a potentially avoidable complication, unless that hospitalization is considered to be a typical service for that patient.

---

[10] See Prometheus Payment Model: Application to Hip and Knee Replacement Surgery, Clinical Orthopaedics and Related Research®: Volume 467, Issue 10 (2009), Page 2587

PROMETHEUS Payment®, Evidence-informed Case Rates™, ECR® are registered trademarks of the Health Care Incentives Improvement Institute, Inc. 2009-2010, all rights reserved.

To-date, we have modeled our ECRs in over twenty different databases of national and regional health plans and employers. We have discovered a great consistency in the nature, frequency and costs associated to PACs. More importantly, we have found that when physicians and hospitals understand that (a) the goal is not zero defects but an improvement on the current level, and (b) the payment model will reward the reduction in PACs, the objections to the definitions of PACs disappear.

We make no excuses for having a broad view of accountability around events that harm patients, quite the contrary. It is only by looking at system failures and care defects from the patient's eyes that we can create a patient-centered health care system, and counting PACs will help us understand the magnitude of the problems that the Institute of Medicine highlighted a decade ago and that still plague the health care system today.

PROMETHEUS Payment®, Evidence-informed Case Rates™, ECR® are registered trademarks of
the Health Care Incentives Improvement Institute, Inc. 2009-2010, all rights reserved.