

Proportion of Patients Hospitalized with AMI / Pneumonia / Stroke that have a Potentially Avoidable Complication (during the Index Stay or in the 30-day Post-Discharge Period)

Background:

As part of the development of the Prometheus Payment model, we have developed and published in several peer-reviewed papers¹⁻⁴ the impact of potentially avoidable complications (PACs) on total cost of care. We define PACs as events that may occur during the index stay or during the 30-day post-discharge period for patients hospitalized with an acute medical illness (AMI / Pneumonia / Stroke). PACs are indicators of health system failure that cause gaps in quality of care. They can be categorized into three types:

- PACs related to the index condition. This would include an event directly related to the acute medical illness either during the index stay or during a subsequent ED visit or readmission. An example would be respiratory failure during the index stay in a patient admitted with pneumonia, or during a readmission.
- PACs related to comorbidities. If one of the patient’s controlled comorbid conditions is exacerbated during the index stay or requires a subsequent ED visit or readmission. For example, an ED visit for an asthma attack in a patient discharged for pneumonia.
- PACs related to patient safety failures. If a patient with an acute medical illness has an event related to patient safety issues during the index stay or during a readmission. Examples are bed sores, line sepsis, adverse drug events, drug interactions etc.

Taken as a whole, PACs occur at a very high frequency in commercially insured populations. The table below illustrates the results of a claims-based analysis on over 3 million plan members under the age of 65.

DESCRIPTION	# of Patients	# of Patients with PACs	% of Patients w PACs
AMI	5,136	3,888	75.70%
Pneumonia	5,263	3,561	67.66%
Stroke	3,961	2,290	57.81%
Acute Medical Summary	14,360	9,739	67.82%

¹ 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.

²de Brantes, D’Andrea, Rosenthal: Should health care come with a warranty? Health Aff (Millwood). 2009 Jul-Aug; 28(4):w678-87. Epub 2009 Jun 16;

³Rastogi, Mohr, et al: Prometheus payment model: application to hip and knee replacement surgery. Clin Orthop Relat Res. 2009 Oct; 467(10):2587-97. Epub 2009 Jun 23;

⁴de Brantes, Rosenthal, Painter: Building a bridge from fragmentation to accountability--the Prometheus Payment model. N Engl J Med. 2009 Sep 10; 361(11):1033-6. Epub 2009 Aug 19.

Measure Purpose and Accountability:

The purpose of this measure is to account for the quantity of events that occur in patients with acute medical illnesses and that could potentially be avoided through better care coordination and disease management. There are many delivery system reform initiatives under way in the country to improve quality of care including the ACE demonstration project and accountable care organizations. Measuring PACs before, during and after these interventions would enable payers, providers and patients to better gauge the impact and success of the efforts.

Further, given the incidence of PACs, creating accountability around this measure would lead to a more systematic delivery system reform than what could be achieved by looking at more discrete measures. PAC rates for medical groups, health systems and health plans could help consumers differentiate the performance of these organizations.

Potential Impact:

In dollar terms, PACs for acute conditions consume 22 cents out of every dollar spent in care for that condition. In addition, there is considerable variation in PAC rates between states and within states. Some delivery systems have been able to achieve very low rates compared to others, indicating that there is significant potential to reduce PAC rates overall and generate significant savings for the nation in addition to better care for patients.

Severity-Adjusted PAC rates:

We have created a severity-adjustment model using resource use as a surrogate measure for the degree of patient comorbidities and severity. Each patient in the user’s database is scored for the presence of risk factors using the predicted log coefficients from the reference model (that are used as weights) to generate a patient-level severity score and, subsequently, the population-level average severity score. The average severity score is compared to the reference database severity score to calculate a severity index, and this in turn helps severity-adjust the PAC rates. The table below illustrates how severity-adjusted PAC rates could be used to compare the performance of three hypothetical hospitals admitting patients for AMI with different number of AMI admissions, different average patient-severity scores, but the same PAC rates:

AMI	Hospital 1	Hospital 2	Hospital 3
Number of Patients	100	50	500
Average Severity Score	6.1542	4.8486	7.5783
Reference Severity Score	6.2243	6.2243	6.2243
Severity Index	0.9887	0.7790	1.2175
PAC rates	75%	75%	75%
Severity Adjusted PAC rates	76%	96%	62%

While there are other measures of avoidable complications and readmissions, there is no other endorsed measure that takes such a comprehensive look at the overall gaps in quality at the patient level and centered around the patient. For more information on the Prometheus model and PACs, go to <http://www.hci3.org>.