Penalizing Hospitals for Chronic Obstructive Pulmonary Disease Readmissions

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Abstract

In October 2014, the U.S. Centers for Medicare and Medicaid Services (CMS) will expand its Hospital Readmission Reduction Program (HRRP) to include chronic obstructive pulmonary disease (COPD). Under the new policy, hospitals with high risk-adjusted, 30-day all-cause unplanned readmission rates after an index hospitalization for a COPD exacerbation will be penalized with reduced reimbursement for the treatment of Medicare beneficiaries. In this perspective, we review the history of the HRRP, including the recent addition of COPD to the policy. We critically assess the use

of 30-day all-cause COPD readmissions as an accountability measure, discussing potential benefits and then highlighting the substantial drawbacks and potential unintended consequences of the measure that could adversely affect providers, hospitals, and patients with COPD. We conclude by emphasizing the need to place the 30-day COPD readmission measure in the context of a reconceived model for postdischarge quality and review several frameworks that could help guide this process.

Keywords: quality indicators; chronic obstructive pulmonary disease; patient readmission; Medicare

In October 2014, the U.S. Centers for Medicare and Medicaid Services (CMS) will begin penalizing hospitals with high risk-adjusted, 30-day all-cause unplanned readmission rates after an index hospitalization for an acute exacerbation of chronic obstructive pulmonary disease (AECOPD) (Table 1) (1). This policy is an extension of Medicare's Hospital Readmission Reduction Program (HRRP), which seeks to improve quality and reduce costs by creating financial incentives for hospitals to prevent readmissions and is part of the larger trend toward increased accountability in health care (2).

In an attempt to improve care quality, eliminate waste, and reduce costs, performance measures are increasingly used in public reporting, pay-for-performance, and accreditation. Yet, as suggested by the Joint Commission, when performance

measures are used for accountability, they should result in a health benefit for patients (3). In this perspective, we will discuss whether 30-day all-cause readmission rates after a hospitalization for AECOPD meet this criterion (1). As we highlight, the 30-day chronic obstructive pulmonary disease (COPD) readmission measure does not possess the characteristics of a high-quality accountability measure and may lead to unintended consequences that adversely affect patients with COPD.

Historical Perspective: The CMS Hospital Readmission Reduction Program

Beginning in 2007, citing concerns regarding the quality and coordination of

healthcare and healthcare costs, the Medicare Payment Advisory Commission (MedPAC) made several recommendations to Congress on overhauling the U.S. healthcare system (4, 5). In part, the objective was to financially incentivize the healthcare system to provide high-quality, patient-centered, and value-driven care by holding hospitals and physicians responsible for care quality and resource use (5). A key focus was the topic of 30-day hospital readmissions. Among Medicare beneficiaries discharged from the hospital in 2005, 17.6% were rehospitalized within 30 days, resulting in estimated annual expense of $17 billion (4, 6). Approximately 76% of these patients were rehospitalized for causes potentially related to poor quality of care (4). The report suggested that decreasing avoidable,

Table 1: Overview of U.S. Centers for Medicare and Medicaid Services 30-Day All-Cause, Risk-Standardized, Readmission Rate after Hospitalization for an Acute Exacerbation of Chronic Obstructive Pulmonary Disease Measure

Data source: Medicare claims data
Eligible readmissions:
 All <u>unplanned</u> readmissions to any inpatient acute care facility for any cause within 30 d of discharge after an index hospitalization for an AECOPD
Index hospitalization for an AECOPD:
 Inclusion criteria:
  Admissions among patients ≥65 yr of age for whom there is complete 12 mo of Medicare FFS enrollment before hospitalization
  ICD-9 discharge diagnoses:
   Primary diagnosis of COPD (ICD-9 codes: 491.21, 491.22, 491.8, 491.9, 492.8, 493.20, 493.21, 493.22, and 496)
   or
   Primary diagnosis of respiratory failure (ICD-9 codes: 518.81, 518.82, 518.84, 799.1) and a secondary diagnosis of AECOPD (ICD-9 codes: 491.21, 491.22, 493.21, 493.22)
 Exclusion criteria:
  Admissions among patients who:
   Die during the index hospitalization
   Are transferred to another acute care facility during the index hospitalization
   Are discharged against medical advice
   Are not enrolled for at least 30 d post discharge in Medicare FFS
Risk standardization:
 Hierarchical logistic modeling: adjust simultaneously for patient-level and hospital-level confounders
 Patient confounders:
  Age
  Patient comorbidities defined using hospital claims data for inpatient and outpatient visits in the 12 mo before, and including, the index COPD hospitalization
   Excludes conditions that are complications of index hospitalization
  Does not include race or socioeconomic status
Calculation of penalties*
 Excess readmission ratio: Uses 3 yr of discharge data to compare a hospital's readmission rates to the national average for specific diagnosis, after adjustment for patient case-mix:

$$\frac{\text{Risk-adjusted predicted readmissions after AECOPD (for hospital)}}{\text{Risk-adjusted expected readmissions after AECOPD (nation's performance with same case-mix)}}$$

Aggregate payments for excess readmissions: [sum of base operating DRG payments for COPD X (excess readmission ratio for COPD − 1)] + [sum of base operating DRG payments for AMI X (excess readmission ratio for AMI − 1)] + [sum of base operating DRG payments for CHF X (excess readmission ratio for CHF − 1)] + [sum of base operating DRG payments for PNA X (excess readmission ratio for PNA − 1)] + [sum of base operating DRG payments for THA/TKA X (excess readmission ratio for THA/TKA − 1)]

Aggregate payments for all discharges = sum of base operating DRG payments for all discharges

$$\textbf{Ratio} = 1 - \frac{\text{Aggregate payments for excess readmissions}}{\text{Aggregate payments for all discharges}}$$

Readmissions Adjustment Factor = For FY 2015, the higher of the ratio or 0.97 (3% reduction)

Definition of abbreviations: AECOPD = acute exacerbation of chronic obstructive pulmonary disease; AMI = acute myocardial infarction; CHF = congestive heart failure; CMS = Centers for Medicare & Medicaid Services; DRG = diagnosis-related group; FFS = fee-for-service; FY = fiscal year; ICD-9 = International Classification of Diseases, Ninth Revision; PNA = pneumonia; THA/TKA = total hip arthroplasty/total knee arthroplasty.
*Available at http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html

quality-driven readmissions could possibly save $12 billion dollars annually (4). MedPAC outlined a plan to financially penalize hospitals with higher-than-expected 30-day readmission rates for selected high-priority conditions (4). In theory, hospitals would respond to these financial penalties by implementing care strategies to reduce readmissions, such as better discharge planning and postdischarge follow-up.

This plan came to fruition in 2010 with the passing of the U.S. Patient Protection and Affordable Care Act (ACA), which identified preventable hospital

readmission as an important means for cost savings. Included within the ACA was legislation to support the HRRP, an initiative that ties Medicare reimbursement to hospitals with patient outcomes (2). Starting in October 2012, CMS began reducing payments by 1% (with plans to increase to a full 3% by October 2014) to hospitals with high rates of all-cause readmission for three conditions: acute myocardial infarction, congestive heart failure (CHF), and pneumonia (7). To date, more than 2,000 hospitals have been penalized nationwide, resulting in an

estimated $280 million dollars in penalties for fiscal year 2013 (8). In October 2014, CMS will expand the conditions to include all-cause unplanned readmissions after an index hospitalization for AECOPD (Table 1) (1).

Why Might a 30-Day All-Cause Readmission Policy Be Good for COPD Care?

Hospital-level, risk-standardized, 30-day all-cause readmission rate after a hospitalization for AECOPD is potentially

Table 2: 30-Day All-Cause Readmission Rates after Hospitalization for AECOPD as an Accountability Measure: Drawbacks and Potential Harms

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Lack of validation of ICD-9 codes used to identify index hospitalizations for AECOPD
Lack of evidence that decreasing readmissions leads to improved outcomes
Uncertainty regarding preventability of readmissions
Penalization of safety-net hospitals and potential to worsen health disparities
Limitations in risk-adjustment techniques
Lack of evidence on how to best prevent avoidable readmissions
Susceptibility to gaming

Definition of abbreviations: AECOPD = acute exacerbation of chronic obstructive pulmonary disease; ICD-9 = International Classification of Diseases, Ninth Revision.

an attractive quality metric for several reasons. First, the financial and public health importance of reducing readmissions is substantial. In the United States, COPD is responsible for more than 1.5 million emergency room visits and 725,000 hospitalizations annually, with resulting healthcare costs approaching $60 billion (9, 10). Among patients hospitalized for AECOPD, 34 to 40% do not receive recommended therapies (11, 12), whereas nearly half receive at least one inappropriate or potentially harmful therapy (11). Approximately 22.6% of patients discharged after AECOPD have an all-cause 30-day readmission, highlighting the significant impact to patients, payers, and healthcare systems (6). Second, measuring rates of rehospitalization is relatively easy using administrative and claims data, an important consideration when assessing the feasibility of a quality metric (13). Third, risk-standardized hospital-level readmission rates are at least theoretically comparable across healthcare settings, and significant variability has been shown in all-cause readmission rates for AECOPD (14). The COPD readmission measure is based on a similar risk-standardized measure of 30-day mortality among patients hospitalized for an AECOPD, which was shown to have good predictive and discriminative ability (15). Last, targeting hospital readmissions provides a discrete time interval to target potential interventions.

Drawbacks and Potential Unintended Harms

Despite these favorable attributes, there remain a number of reasons as to why 30-day risk-adjusted readmission rates, particularly among patients hospitalized with AECOPD, fall far short of being an ideal accountability measure. Hospital care quality is only one of several factors associated with the subsequent need for 30-day rehospitalization, with other determinants including factors such as access to high-quality outpatient services. Thirty-day hospital readmission rates also do not directly identify which components of hospital care need to be addressed. More importantly, the measure does not directly address patient well-being or overall health (16). We detail specific concerns below (Table 2) (16, 17).

Lack of Validated International Classification of Diseases, Ninth Revision Codes Used to Identify AECOPD
The CMS algorithm used to identify index hospitalizations for AECOPD includes either a primary International Classification of Diseases, Ninth Revision (ICD-9) COPD discharge diagnosis or a primary ICD-9 discharge diagnosis of respiratory failure with a secondary ICD-9 diagnosis of AECOPD (Table 1). This algorithm is one of several published definitions of AECOPD; none of these algorithms have been validated, and rates of hospitalization for AECOPD vary widely depending on which algorithm is used (18). Despite National Quality Forum endorsement, we remain concerned about the validity of the measure when used for accountability purposes.

Lack of Evidence That Decreasing Readmissions Results in Improved Outcomes
Although reducing hospital admissions could lead to savings, models such as the Institute for Healthcare Improvement's triple aim suggest that reduced healthcare costs need to be considered in the context of population health and patient healthcare experiences (19). Higher rates of readmission after hospitalization for exacerbations of some chronic diseases, such as CHF, are associated with lower, rather than higher, mortality (20, 21).

Given many common attributes between CHF and COPD, one might hypothesize a similar finding among patients hospitalized for AECOPD. An unintended consequence of implementing incompletely understood accountability measures is to potentially reduce overall patient health.

Uncertainty Regarding Preventability of Readmissions
The CMS HRRP assumes that the majority of readmissions occurring early in the postdischarge period are avoidable. However, the actual proportion of hospital readmissions that are preventable remains unknown. Although early studies suggested that patients receiving less than optimal care were at significantly increased risk for readmission (22, 23), more contemporary studies suggest that the association between quality of inpatient care and risk of readmission is weaker than previously suspected. A recent study examining hospital performance on two publically reported measures of discharge found only a small association between self-reported patient assessments of discharge planning and risk of 30-day readmission (24). Furthermore, in a metaanalysis of 34 studies, the median proportion of hospital readmissions defined as being "avoidable" was only 27.1%, nearly threefold lower than initially believed (4, 25). In the specific case of COPD, there is no direct link between quality of care and risk of 30-day hospital readmission. As a result, doubt remains as to the preventability of readmissions and the validity of the measure as a surrogate for hospital quality of care (16, 17).

Penalization of Safety-Net Hospitals and Potential to Worsen Health Disparities
Evidence suggests that the majority of readmissions are likely to due to nonmodifiable factors external to the hospital setting. For instance, among Medicare beneficiaries hospitalized for acute myocardial infarction, CHF, and pneumonia, being of black race and being cared for at a safety-net hospital were both independently associated with an increased risk of all-cause readmission within 30 days (26). Similarly, among patients hospitalized with AECOPD, readmission rates were 22% higher among patients living in the lowest income regions and higher among blacks compared with other

racial/ethnic groups (27). Current risk-stratification models used by CMS do not include race or socioeconomic status as adjustment variables. CMS provides several reasons for this lack of adjustment, including: (1) receipt of lower-quality care could be responsible for poorer health outcomes among patients of low socioeconomic status, (2) hospitals caring for disadvantaged patients should not be held to different standards, and (3) adjustment for socioeconomic status or race could hide differences in care or reduce motivation to improve outcomes among patients of low socioeconomic status (1). Nevertheless, these findings have raised concern that financial penalties incurred may worsen health disparities by penalizing safety-net hospitals and institutions with fewer resources (16, 17).

A recent report about hospital penalties supports these concerns (28). Among the more than 3,000 hospitals reporting in fiscal year 2012, large hospitals (≥400 beds), teaching hospitals, and those identified as safety-net facilities were most likely to incur high penalties and least likely to receive no penalties. COPD disproportionately affects patient of lower socioeconomic status (29). We might expect that penalties for AECOPD will be levied against those hospitals that are the least able to absorb the cuts and have the potential unintended effect of limiting resources to the exact population they intend to serve.

Additional Limitations in Risk-Adjustment Techniques

Race and socioeconomic status are only two of several nonmodifiable risk factors that are not accounted for within the current CMS risk-stratification system. Like most other risk-prediction models, the CMS risk-stratification system adjusts for medical comorbidity and age, yet does not account for other measures of general health and functional ability (such as health-related quality of life or cognitive impairment), severity of acute illness, or "social determinants of health," such as health literacy, caregiver support, and access to care (30). Although difficult to measure using administrative or claims data, these patient-specific factors are known to be important predictors of hospital readmission and health outcomes (31–33) and may explain in part why current risk prediction models

have been shown to have poor discriminative ability and lead to disproportionate over-penalization (30).

Lack of Evidence on How Best to Prevent Avoidable Readmissions

Based on the evidence discussed above, it is likely that only a minority of early hospital readmissions after an index hospitalization for AECOPD are potentially modifiable. Nevertheless, given the prevalence of COPD and high costs associated with AECOPD hospitalizations, some would argue that any decrease in rates of readmission could lead to substantial savings. For this to be true, however, evidence-based interventions must first be identified for implementation by hospitals and healthcare providers. Unfortunately, despite intensive study in this area, to date no intervention has been shown to be

reproducibly effective in reducing all-cause readmission risk (34). Although project Better Outcomes for Older adults through Safe Transitions (BOOST) reported a marginal benefit to hospital readmission using a multidimensional approach, only 11 of 30 enrollment sites reported outcome data, raising concern about inferences that can be drawn (35). Among patients with AECOPD, few studies have addressed interventions to reduce hospital readmissions. Those that have been performed have revealed conflicting results, including one recent study of a disease self-management intervention that had no effect on hospital readmission but tripled the rate of mortality (36). This lack of a strong evidence base has led some to suggest that until effective interventions are found, planned penalties under the HRRP should be reconsidered and further expansion to other conditions postponed (34).

Table 3: Framework for "Ideal" Care Transition from Hospital to Community Setting Proposed by Burke and Colleagues

Predischarge planning
Involvement of multidisciplinary teams collaborating with PCP
Timely outpatient appointments arranged that account for patient/caregiver needs and preferences
Communication of information pertaining to recent admission to outpatient providers
Details about hospital course and functional status at discharge
Subspecialty clinician recommendations
Abnormal test results that need follow-up; pending tests
Follow-up appointments arranged or need to be scheduled, etc.
Information relayed is timely, organized, and easily accessible
Use of structured templates for discharge summaries
Verbal communication with outpatient providers
Medication safety
Accurate medication history obtained
Reconciliation with preadmission medications performed at discharge; changes clarified
Patient education to promote self-management
Targeted discharge counseling
Consistent education by staff using "teach-back" methods
Written instructions
Use of transition coaches for "high-risk" patients
Engaging community support
Home services
Caregivers
Advance care planning
Goals of care discussion
Identify surrogate decision maker
Palliative care and hospice consultation as appropriate
Care coordination between inpatient and outpatient providers
Formal handoffs
Communication with all team members (nurses, clinicians, etc.).
Symptom treatment and assessment after discharge
Postdischarge phone calls, home visits, and clinic visits
Hotline for patients
Outpatient follow-up
Shortly after discharge with PCP and specialists as needed
Incorporation of multidisciplinary teams

Definition of abbreviation: PCP = primary care physician.
Summary of framework presented in Reference 37.

Susceptibility to Gaming

Hospital readmission might seem difficult to game, but with the measure comes an incentive to develop "creative solutions" to reduce the impact of high readmission rates. For instance, by admitting patients to hospital who might otherwise be discharged from emergency room settings, hospitals could benefit by enriching their admitted population with patients at lower risk of readmission. Alternatively, hospitals could extend holding areas, where patients receive hospital-level care without being actually admitted to hospital, making them ineligible for readmission penalties. A third method would be to avoid coding for AECOPD or selectively code for COPD among patients who are suspected to do well after discharge. We suspect that if presented with sufficient incentives, the healthcare system will find ways of avoiding penalties without directly improving health or healthcare delivery.

Moving Forward: Improving Quality of Care and Outcomes among Patients Hospitalized with COPD

Despite the number of criticisms that have been raised regarding the use of 30-day all-cause readmission rates as an accountability metric, CMS has elected to expand the HRRP. Healthcare systems are now faced with how best to effect change in the absence of a strong evidence base to reduce rates of hospital readmission. Rather than focusing on the measure itself, a reconceived model for postdischarge quality is likely needed, incorporating readmission as a function of overall health that is influenced by care processes not only within the hospital but also in the patient's home/outpatient environment. Several frameworks have been suggested to help guide this process, two of which are reviewed here.

Burke and colleagues state that the current concerns regarding the use of hospital readmissions as a quality metric are in part due to a lack of evidence regarding the "state of the science of transitional care" and "future efforts in this area will be hindered without a clear vision of an ideal transition in care" (37). They go on to describe "an ideal framework" for care transitions including 10 specific domains that span from discharge after an index hospitalization to follow-up within the community, summarized in Table 3. The authors suggest that a potential implication of the model is that hospitals that are highly incentivized to reduce readmissions should be motivated to improve relationships with, and invest in, the network of providers in the outpatient setting from which their inpatients arise.

An additional framework suggested by Kangovi and Grande contains similar themes as those proposed by Burke and colleagues and includes a broad set of concepts including healthcare policy, patient access to inpatient and outpatient care, and patient health and socioeconomic status (38). Within this framework of hospital readmissions, investment in communities is necessary to help address the socioeconomic limitations and improve access to quality care. In the end, this is consistent with the overall goals of the healthcare system overhaul endorsed by the ACA, and is supported by the 5-year, $500 million CMS "Community-based Care Transition Program" created under an additional provision of the ACA.

Conclusions

Intuitively, incentivizing hospitals, either by reward or penalty, to provide high-quality care makes sense when the care provided is insufficient and contributes to hospital readmissions. Although the HRRP has elected to proceed with implementation of the new AECOPD readmission accountability measure, we believe that, at best, there is insufficient evidence to support the use of the measure for accountability purposes. Given the evidence that hospitals are unlikely to be able reduce readmission without significant community- and outpatient-based involvement, a reasonable interpretation of the purpose of this measure is to reduce cost, independent of quality. There is no doubt that healthcare costs need to be contained, but reducing cost in absence of understanding the effect on patient health makes little sense. Given the state of the current evidence, CMS might consider, in lieu of potentially creating greater disparities, providing hospitals additional funds to promote patient well-being through efforts such as the Community-based Care Transition Program designed to improve transitions to outpatient and home environments. ∎

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