

Reconsidering Hospital Readmission Measures

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Current hospital readmission measures are part of the Centers for Medicare & Medicaid Services Five-Star Quality Rating System but are inadequate for reporting hospital quality. We review potential biases in the readmission measures and offer policy recommendations to address these biases. Hospital readmission rates are influenced by multiple sources of variation (eg, mix of patients served, bias in the performance measure); true differences in quality of care are often a much smaller source of this variation. Thus, variation from caring for large proportions

of socioeconomically disadvantaged or tertiary-care patients will bias a hospital's ratings. Ratings aside, readmission measures may indirectly harm patients because low readmission rates do not correlate with reduced mortality, yet the Five-Star Quality Rating System weighs readmission equally with mortality. We propose that hospital quality rankings not use readmission measures as currently constructed. *Journal of Hospital Medicine* 2017;12:1009-1011. Published online first August 23, 2017. © 2017 Society of Hospital Medicine

Hospital readmission rates are a consequential and contentious measure of hospital quality. Readmissions within 30 days of hospital discharge are part of the Centers for Medicare & Medicaid Services (CMS) Value-Based Purchasing Program and are publicly reported. Hospital-wide readmissions and condition-specific readmissions are heavily weighted by *US News & World Report* in its hospital rankings and in the new CMS Five-Star Quality Rating System.¹ However, clinicians and researchers question the construct validity of current readmission measures.^{2,3}

The focus on readmissions began in 2009 when Jencks et al.⁴ reported that 20% of Medicare patients were readmitted within 30 days after hospital discharge. Policy makers embraced readmission reduction, assuming that a hospital readmission so soon after discharge reflected poor quality of hospital care and that, with focused efforts, hospitals could reduce readmissions and save CMS money. In 2010, the Affordable Care Act introduced an initiative to reduce readmissions and, in 2012, the Hospital Readmission Reduction Program was implemented, financially penalizing hospitals with higher-than-expected readmission rates for patients hospitalized with principal diagnoses of heart failure, myocardial infarction, and pneumonia.⁵ Readmission measures have since proliferated and now include pay-for-performance metrics for hospitalizations for chronic obstructive pulmonary disease (COPD), coronary artery bypass grafting, and total hip or knee arthroplasty. Measures are also report-

ed for stroke patients and for "hospital-wide readmissions," a catch-all measure intended to capture readmission rates across most diagnoses, with various exclusions intended to prevent counting planned readmissions (eg, hospitalization for cholecystectomy following a hospitalization for cholecystitis). These measures use claims data to construct hierarchical regression models at the patient and hospital levels, assuming that variation among readmission rates are due to hospital quality effects. The goal of this approach is to level the playing field to avoid penalizing hospitals for caring for sicker patients who are at higher risk for readmission for reasons unrelated to hospital care. Yet hospital readmissions are influenced by a complex set of variables that go well beyond hospital care, some of which may be better captured by existing models than others. Below we review several potential biases in the hospital readmission measures and offer policy recommendations to improve the accuracy of these measures.

Variation in a quality measure is influenced by the quality of the underlying data, the mix of patients served, bias in the performance measure, and the degree of systemic or random error.⁶ Hospital readmission rates are subject to multiple sources of variation, and true differences in the quality of care are often a much smaller source of this variation. A recent analysis of patient readmissions following general surgery found that the majority were unrelated to suboptimal medical care.⁷ Consider 3 scenarios in which a patient with COPD is readmitted 22 days after discharge. In hospital 1, the patient was discharged without a prescription for a steroid inhaler. In hospital 2, the patient was discharged on a steroid inhaler, filled the prescription, and elected not to use it. In hospital 3, the patient was discharged on a steroid inhaler and was provided medical assistance to fill the prescription but still could not afford the \$15 copay. In all 3

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scenarios, the hospital would be equally culpable under the current readmission measures, suffering financial and reputational penalties.

Yet the hospitals in these scenarios are not equally culpable. Variation in the mix of patients and bias in the measure impacted performance. Hospital 1 should clearly be held accountable for the readmission. In the cases of hospitals 2 and 3, the situations are more nuanced. More education about COPD, financial investment by the hospital to cover a copay, or a different transitional care approach may have increased the likelihood of patient compliance, but, ultimately, hospitals 2 and 3 were impacted by personal health behaviors and access to public health services and financial assistance, and the readmissions were less within their control.⁸

To be valid, hospital readmission measures would need to ensure that all hospitals are similar in patient characteristics and in the need for an availability of public health services. Yet these factors vary among hospitals and cannot be accounted for by models that rely exclusively on patient-level variables, such as the nature and severity of illness. As a result, the existing readmission measures are biased against certain types of hospitals. Hospitals that treat a greater proportion of patients who are socioeconomically disadvantaged; who lack access to primary care, medical assistance, or public health programs; and who have substance abuse and mental health issues will have higher readmission rates. Hospitals that care for patients who fail initial treatments and require referral for complex care will also have higher readmission rates. These types of patients are not randomly distributed throughout our healthcare system. They are clustered at rural hospitals in underserved areas, certain urban health systems, safety net hospitals, and academic health centers. It is not surprising that readmission penalties have most severely impacted large academic hospitals that care for disadvantaged populations.² These penalties may have unintended consequences, reducing a hospital's willingness to care for disadvantaged populations.

While these biases may unfairly harm hospitals caring for disadvantaged patients, the readmission measures may also indirectly harm patients. Low hospital readmission rates are not associated with reduced mortality and, in some instances, track with higher mortality.⁹⁻¹¹ This may result from measurement factors (patients who die cannot be readmitted), from neighborhood socioeconomic status (SES) factors that may impact readmissions more,¹² or from actual patient harm (some patients need acute care following discharge and may have worse outcomes if that care is delayed).¹¹ Doctors have long recognized this potential risk; empiric evidence now supports them. While mortality measures may also be impacted by sociodemographic variables,¹³ whether to adjust for SES should be defined by the purpose of the measure. If the measure is meant to evaluate hospital quality (or utilization in the case of readmissions), adjusting for SES is appropriate because it is unrealistic to expect a health system to reduce income inequality and provide safe housing. Failure to adjust for SES, which has a large impact on outcomes, may mask a quality of care issue. Conversely, if the

purpose of a measure is for a community to improve population health, then it should not be adjusted for SES because the community could adjust for income inequality.

Despite the complex ethical challenges created by the efforts to reduce readmissions, there has been virtually no public dialogue with patients, physicians, and policy makers regarding how to balance the trade-offs between reducing readmission and maintaining safety. Patients would likely value increased survival more than reduced readmissions, yet the current CMS Five-Star Rating System for hospital quality weighs readmissions equally with mortality in its hospital rankings, potentially misinforming patients. For example, many well-known academic medical centers score well (4 or 5 stars) on mortality and poorly (1 or 2 stars) on readmissions, resulting in a low or average overall score, calling into question face validity and confounding consumers struggling to make decisions about where to seek care. The Medicare Payment Advisory Commission's Report to the Congress¹⁴ highlights the multiple significant systematic and random errors with the hospital readmission data.

REVISITING THE HOSPITAL READMISSION MEASURES

Given significant bias in the hospital readmission measures and the ethical challenges imposed by reducing readmissions, potentially at the expense of survival, we believe CMS needs to take action to remedy the problem. First, CMS should drop hospital readmissions as a quality measure from its hospital rankings. Other hospital-rating groups and insurers should do the same. When included in payment schemes, readmissions should not be construed as a quality measure but as a utilization measure, like length of stay.

Second, the Department of Health & Human Services (HHS) should invest in maturing the hospital readmission measures to ensure construct, content, and criterion validity and reliability. No doubt the risk adjustment is complex and may be inherently limited using Medicare claims data. In the case of SES adjustment, for example, limited numbers of SES measures can be constructed from current data sources.^{8,13} There are other approaches to address this recommendation. For example, HHS could define a preventable readmission as one linked to some process or outcome of hospital care, such as whether the patient was discharged on an inhaler. The National Quality Forum used this approach to define a preventable venous thromboembolic event as one occurring when a patient did not receive appropriate prophylaxis. In this way, only hospital 1 in the 3 scenarios for the patient with COPD would be penalized. However, we recognize that it is not always simple to define specific process measures (eg, prescribing an inhaler) that link to readmission outcomes and that there may be other important yet hard-to-measure interventions (eg, patient and family education) that are important components of patient-centered care and readmission prevention. This is why readmissions are so challenging as a quality measure. If experts cannot define clinician behaviors that have a strong theory of change or are causally related to re-

duced readmissions, it is hard to call readmissions a modifiable quality measure. Another potential strategy to level the playing field would be to compare readmission rates across peer institutions only. For instance, tertiary-care safety net hospitals would be compared to one another and rural community hospitals would be compared to one another.¹⁴ Lastly, new data sources could be added to account for the social, community-level, public health, and personal health factors that heavily influence a patient's risk for readmission, in addition to hospital-level factors. Appropriate methods will be needed to develop statistical models for risk adjustment; however, this is a complex topic and beyond the scope of the current paper.

Third, HHS could continue to use the current readmission measures as population health measures while supporting multistakeholder teams to better understand how people and their communities, public health agencies, insurers, and healthcare providers can collaborate to help patients thrive and avoid readmissions by addressing true defects in care and care coordination.

While it is understandable why policy makers chose to focus on hospital readmissions, and while we recognize that concerns about the measures were unknown when they were created, emerging evidence demonstrates that the current

readmission measures (particularly when used as a quality metric) lack construct validity, contain significant bias and systematic errors, and create ethical tension by rewarding hospitals both financially and reputationally for turning away sick and socially disadvantaged patients who may, consequently, have adverse outcomes. Current readmission measures need to be reconsidered.

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