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Penalizing Readmissions after Sepsis could do more Harm than Good

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In the past few years, we have learned much about the epidemiology of hospital readmission in sepsis survivors. Post-sepsis readmissions are common and costly¹; many may be preventable²; and they account for a greater proportion of all readmissions than any other index hospitalization diagnoses³.

In this edition of *Critical Care Medicine*, Norman and colleagues show that readmission rates after sepsis also vary widely across US hospitals⁴. In the study, they measured all-cause 30-day readmissions after sepsis using a 100% sample of Medicare beneficiaries spanning three years. Following the methods used by Centers for Medicare and Medicaid Services (CMS)⁵ for other conditions, they adjusted for demographics and co-morbidity burden in order to generate a “risk-standardized” readmission rate (RSRR) for each hospital. The mean RSRR after sepsis was 29.2%, similar to prior studies². However, the RSRR varied widely across hospitals, from 22.2% for a 5th percentile hospital to 37.8% for a 95th percentile hospital.

So, what must be done to tackle this pesky problem? Some have argued that sepsis hospitalizations should be included in the CMS Hospital Readmission Reduction Program (HRRP)³. In this scenario, hospitals with greater than expected readmission rates after sepsis would face financial penalties. In 2017, total CMS penalties for readmissions following conditions already included in the HRRP will increase to a record high of \$528 million⁶. But, as we know from clinical practice, some treatments are worse than the disease they are intended to treat, so the decision to add sepsis to the list of penalized conditions should not be made lightly.

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Norman and colleagues provide important information about which type hospitals would fare poorly under such a readmission penalty. Hospitals with higher RSRRs were more likely to be teaching institutions and to care for a greater proportion of underserved patients. Furthermore, hospitals with higher RSRRs had better overall quality, as measured by a composite quality score that incorporated a variety of metrics (process measures, outcomes measures, and patient experience scores) reported on CMS's Hospital Compare website. Hospitals in the top quartile of hospital quality by this composite score had a RSRR of 32%—significantly worse than bottom quartile hospitals (27.5%). Thus, as has been seen for other conditions⁷, hospitals who are delivering high-quality medical care by other measures, and caring more under-served patients, would be disproportionately affected by a sepsis readmission penalty.

There are several potential explanations for the wide variation in readmission rates and the counter-intuitive relationship between RSRR and hospital quality. One possible explanation is residual confounding. Recent studies suggest a variety of factors beyond demographics and comorbidities are important for predicting a patient's readmission risk—but are not available in claims data⁸. Furthermore, even the very best models built on robust clinical data extracted from the electronic health record still struggle to predict readmissions with high accuracy^{8,9}. Current studies are now incorporating qualitative data, such as patient interviews, in hopes of finding better readmission predictors¹⁰. In the meantime, because we cannot predict risk of readmission with sufficient accuracy using claims data, much of the observed variation in RSRRs may be due to unmeasured factors, not differences in the quality of medical care. In short, the wide variation may be due to noise, rather than signal.

Based on differences in characteristics between hospitals with available quality data and those without (approximately 40% of hospitals in the current study), it is also possible that including institutions which are often excluded from hospital-level analyses would result in different associations. Overall, we must develop more robust approaches for validating readmission metrics, identify processes of care or effective interventions for reducing sepsis readmissions that could be used as performance measures, and clarify the real-world consequences of incorporating these metrics in reimbursement penalties.

In summary, we believe that penalizing outlier hospitals with high RSRRs after sepsis would be premature. While readmissions are common, costly, and widely variable across institutions, we cannot determine from claims data which readmissions could or should have been avoided. We cannot conclude that institutions with higher RSRRs provide worse care. Therefore, incorporating sepsis readmission metrics into CMS reimbursement penalties may result in unwanted downstream effects.

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