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Original Study

Variation in 30-Day Readmission Rates Among Medically Complex Patients at Inpatient Rehabilitation Facilities and Contributing Factors

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A B S T R A C T

Objective: Few studies have focused on 30-day readmission rates in inpatient rehabilitation facilities (IRFs) and factors that contribute to this. The purpose of this study was to examine the variation in 30-day readmission rates among medically complex patients at IRFs nationally and explore how patient and facility characteristics are associated with this variation.
Design: Retrospective review of an administrative database.
Setting: IRFs throughout the United States.
Participants: Patients from the medically complex impairment group treated at IRFs nationwide represented in the Uniform Data System for Medical Rehabilitation (UDS_{MR}) from 2002 to 2011.
Measurements: Using multilevel logistic regression analysis, 16 patient and facility characteristics were examined to identify and adjust for variables with a significant effect on readmission rates. Unadjusted and adjusted readmission rates were plotted by facility rank. Facilities were grouped by decile, based on readmission rates, and the mean unadjusted and adjusted rates for the lowest and highest deciles were compared to quantify the variation due to adjustment. Patient and facility characteristics for the highest and lowest deciles were compared.
Results: A total of 117,156 medically complex patients from 682 IRFs nationwide were included. Patients were 46% male and 84% white with an average age of 71.5 years. Nine of 16 characteristics were identified that significantly increased the odds of readmission, including older age, male gender, poorer admission motor function, longer duration of impairment, higher Elixhauser comorbidity index, unemployed or retired status, larger facility size, lower mean facility admission motor function, and eastern or western geographic area.
The average unadjusted and adjusted readmission rates for all facilities were 15.63% and 15.86%, respectively. The unadjusted readmission rates for the lowest and highest deciles were 6.71% and 26.48%, respectively. After adjustment, this narrowed to 10.33% and 21.91%, respectively. Patient and facility characteristics accounted for 41% of the variation seen in the readmission rates for these groups.
Facilities with the highest readmission rates (highest decile) more commonly cared for patients at highest risk for readmission: unemployed, male patients with higher comorbidity index and poorer motor function on admission.
Conclusion: This study shows significant variation in readmission rates for medically complex patients across IRFs. However, nearly half (41.4%) of this variation was attributed to 9 patient and facility characteristics, suggesting the need for risk adjustment if readmission rates are to be used as a quality indicator for IRFs.

Up to 20% of Medicare beneficiaries[1] and between 8.6% and 13.9% of patients with other primary payers[2] require acute-care readmission within 30 days of discharge from US hospitals. In 2011, this totaled 3.3 million patients costing more than $41 billion.[3] Readmission rates for

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specific diagnoses have shown substantial variation among acute-care hospitals (ACHs),[4] highlighting an area of potential improvement in care delivery.

For this reason, the Hospital Readmissions Reduction Program was implemented in 2012 as part of the Affordable Care Act, aiming to reduce readmissions by lowering payments to hospitals that have excess readmissions. Currently, ACHs with higher-than-expected 30-day readmission rates are penalized by reducing their annual reimbursement for all patients by up to 3%, totaling $428 million in fines to 2610 hospitals in 2014.[5] Readmission rate calculations are made based on Medicare patients treated for 6 specified diagnoses: heart failure, acute myocardial infarction, pneumonia, chronic obstructive pulmonary disease, total hip arthroplasty (THA), and knee replacement (TKR).

Many argue that readmission rates should not be used for reimbursement purposes, as they are not a good quality indicator and penalize health care facilities for caring for older, sicker patients at higher risk of readmission. Readmissions are frequently not preventable,[6] and a significant amount of the variation seen in ACH readmission rates has been linked to nonmodifiable patient characteristics.[7,8] The Centers for Medicare and Medicaid Services (CMS) does adjust for age, discharge diagnosis, and recent diagnoses when determining expected readmission rates, but it does not factor in other patient characteristics shown to increase readmission risk, including socioeconomic status, functional status, or social support.

Although extensive research into readmission rate variation has occurred in ACHs, little or no research has assessed the variability of 30-day readmission rates for patients treated at inpatient rehabilitation facilities (IRFs). Up to 5% of US patients are transferred from ACHs to IRFs on discharge, totaling nearly 500,000 patients yearly.[9] IRFs often care for patients at high risk for readmission[10] and also commonly care for those diagnostic groups by which ACH readmission rates are judged, following THA and TKR. IRFs are also financially penalized, albeit indirectly, for high readmission rates under the current Medicare interrupted stay policy. In addition, the National Quality Forum recently identified 30-day readmission rates as a quality indicator for IRFs. As of October 1, 2016, IRF readmission rates will be published publicly as a performance measure.[11] Furthermore, as reimbursement methods evolve to include bundled payments and outcome-based measures, a better understanding of readmission rates may lead to more appropriate reimbursement models. For example, as of April 1, 2016, a bundled payment system for Medicare patients has been mandated across 800 hospitals nationwide. Under this model, high readmission rates from IRFs will result in diminishing returns to both ACHs and IRFs. Last, numerous reports have attributed large variations in health care costs to post-acute care,[12] emphasizing this to be an area of large potential health care savings. For these reasons, it is critical to better understand readmission rate variation across IRFs and what factors contribute to this variability.

The purpose of this study is to (1) determine the mean readmission rate for medically complex patients treated at IRFs nationwide, (2) quantify the variation in readmission rates among IRFs, and (3) explore how nonmodifiable patient and facility characteristics affect this variation. Based on similar studies performed in ACHs, the hypothesis is that significant variation will be seen across IRFs nationwide, but a large portion of this variation will be attributed to patient and facility characteristics.

Methods

Study Design

Retrospective review of administrative data.

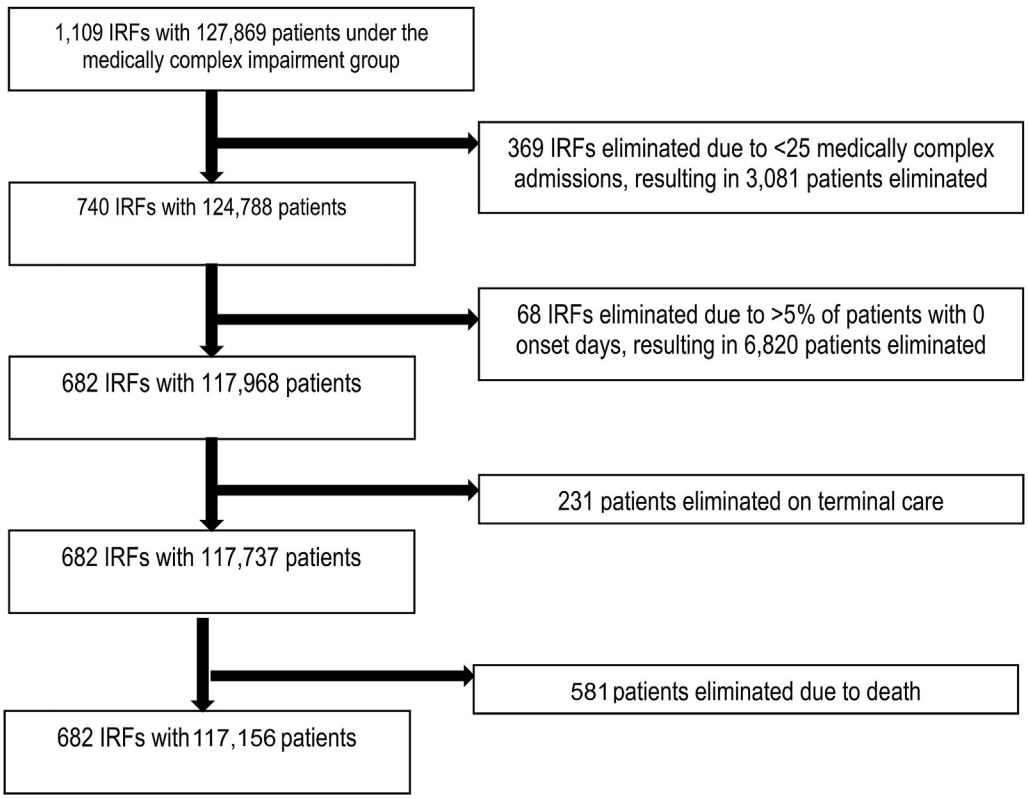

Fig. 1. Inclusion and exclusion criteria.