Comparison of Two Comorbidity Indices and a Hospital Risk Score in Prediction of Early & Late Rehospitalization

Deborah Lekan,* PhD, RN-BC, Thomas P. McCoy,* PhD, PStat, Prashanti Manda,** PhD, Somya Mohanty,** PhD, Rohit Gulia,** BS, Marjorie Jenkins,*** PhD, RN, NEA-BC, FACHE

INTRODUCTION
The challenges presented by the complex health care requirements and diverse needs of hospitalized older adults highlight the importance of understanding risk in this population. Comorbid illness has been used to differentiate risk for adverse outcomes in older adults (Charlson et al., 1987; Elixhauser et al., 1998). Considering that comorbid illness may not capture all of the relevant risks, other scores have been developed using demographic and administrative data from electronic health records (EHR).

PURPOSE
To determine the influence of 1) demographic variables, 2) the Charlson and Elixhauser Comorbidity Index, constructed from International Classification of Disease and Related Health Problems (ICD) codes for medical conditions present on admission, and 3) a hospitalization risk score, in the prediction of early (3-7 day) and late (30-day) rehospitalization.

BACKGROUND
Rehospitalizations are associated with negative patient outcomes and high health care costs. It is estimated that nearly 20% of Medicare patients are readmitted within 30 days. Rehospitalization within 30 days may be due to patient factors, as well as factors associated with the healthcare system such as the quality of care, care coordination, and discharge planning. The Medicare Payment Advisory Commission has estimated that 12% of rehospitalizations are potentially avoidable, thus reducing rehospitalization has been made a national priority. Patient with greater comorbidity are more medically complex and require greater attention to inpatient care delivery and post-discharge planning. The presence of certain medical conditions may signal potential risk, however comorbidity risk indices that aggregate medical conditions into risk scores may offer advantages in more precisely estimating risk. Since there is evidence that different factors may be associated with early and late rehospitalization, understanding patient-related factors will help inform future prevention efforts.

METHOD
This is a big data analysis of EHRs from adults ≥50 years who had at least one hospitalization in a health system in the Southeastern U.S. from 2013-2017. Descriptive statistics and data visualizations for the comorbidity indices and the hospitalization risk score will be assessed. The primary outcomes are all-cause rehospitalization within 3, 7, and 8-30 days after hospital discharge.

RESULTS
Table 1. Multivariable Logistic Modeling of 30-day Rehospitalization

CONCLUSIONS
Patient comorbidity is an important aspect in risk prediction. To help reduce the rate of rehospitalization, health care providers may need to pay more attention to factors including comorbidities to identify high-risk patients for rehospitalization. Factors associated with early (within 7 days) and late (8-30 days) rehospitalization may differ; tailored approaches to address these factors can guide strategies for better patient outcomes.

References

*School of Nursing; **Computer Science; ***Nurse Practitioner