

Most hospital readmission prediction models perform poorly

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A review and analysis of 26 validated hospital readmission risk prediction models finds that most, whether for hospital comparison or clinical purposes, have poor predictive ability, according to an article in the October 19 issue of *JAMA*.

"An increasing body of literature attempts to describe and validate hospital readmission [risk prediction](#) tools," according to background information in the article. "Predicting hospital readmission risk is of great interest to identify which patients would benefit most from care transition interventions, as well as to risk-adjust [readmission rates](#) for the purposes of hospital comparison."

Devan Kansagara, M.D., M.C.R., of Portland Veterans Affairs Medical Center and Oregon Health and Science University, Portland, and colleagues conducted a systematic review of studies on validated readmission risk prediction models to examine their performance and assess their suitability for clinical or administrative use. Of 7,843 citations reviewed, 30 studies of 26 unique models across a broad variety of settings and patient populations met the inclusion criteria. Total sample size ranged from 173 patients to more than 2.7 million patients.

Among the models, the outcome of 30-day readmission was reported most commonly, although some models used other follow-up intervals ranging from 14 days to 4 years. Fourteen models were based on retrospective administrative data and could potentially be used for hospital comparison purposes. Most of these included variables for

medical comorbidity and use of prior medical services. Of these models, 9 were tested in large U.S. populations and had poor discriminative ability.

"Seven models could potentially be used to identify high-risk patients for intervention early during a hospitalization, and 5 could be used at [hospital discharge](#). Six studies compared different models in the same population and 2 of these found that functional and social variables improved model discrimination. Although most models incorporated variables for medical comorbidity and use of prior medical services, few examined variables associated with overall health and function, illness severity, or social determinants of health," the researchers write.

"... the poor discriminative ability of most of the administrative models we examined raises concerns about the ability to standardize risk across hospitals to fairly compare hospital performance. Until risk prediction and risk adjustment become more accurate, it seems inappropriate to compare hospitals in this way and reimburse (or penalize) them on the basis of risk-standardized readmission rates."

The authors add that additional research is needed to assess the true preventability of readmissions in U.S. health systems. "Given the broad variety of factors that may contribute to preventable readmission risk, models that include factors obtained through medical record review or patient report may be valuable. Innovations to collect broader variable types for inclusion in administrative data sets should be considered. Future studies should assess the relative contributions of different types of patient data (e.g., psychosocial factors) to readmission risk prediction by comparing the performance of models with and without these variables in a given population. These models should ideally be based on population-specific conceptual frameworks of risk."

The researchers conclude that most models created to date, whether for

hospital comparison or clinical purposes, have poor predictive ability. "Although in certain settings such models may prove useful, better approaches are needed to assess [hospital](#) performance in discharging patients, as well as to identify patients at greater risk of avoidable readmission."

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