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Title

Development and validation of simple risk scores to predict hospitalization in outpatients with COVID-19 including Omicron

Priority 1 (Research Category)

COVID-19

Presenters

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Abstract

Context: Outpatient physicians need guidance to support decisions regarding hospitalization of COVID-19 patients and how closely to follow outpatients. Objective: To develop and validate simple risk scores to predict hospitalization for outpatients with COVID-19 that do not require laboratory testing or imaging, including during the Omicron wave. Study Design and Analysis: Derivation and validation of clinical prediction rules. Setting: Primary and urgent care clinics in a Pennsylvania health system. Population Studied: Patients 12 years and older presenting who had a positive polymerase chain reaction test for SARS-CoV-2. Outcome Measures: Classification accuracy (percent in each risk group hospitalized) and area under the receiver operating characteristic curve (AUC). Results: Overall, 4.0% of 5843 outpatients in the early derivation cohort (before 3/1/21), 4.2% of 3806 outpatients in the late validation cohort (3/1/21 to 9/30/21), and 1.2% in an Omicron cohort were hospitalized. The base risk score included age, dyspnea, and any comorbidity. Other scores added fever, respiratory rate and/or oxygen saturation. All had very good overall accuracy (AUC 0.85-0.87) and classified about half of patients into a low-risk group with < 1% hospitalization risk. Hospitalization rates in the Omicron cohort were 0.22%, 1.3% and 8.7% for the base score. Two externally derived risk scores identified more low risk patients, but with a higher overall risk of hospitalization than our novel risk scores. Conclusions: A simple risk score suitable for outpatient and telehealth settings can classify over half of COVID-19 outpatients into a very low risk group with a 0.22% hospitalization risk in the Omicron cohort. The Lehigh Outpatient COVID Hospitalization (LOCH) risk score is available online as a free app: <https://ebell-projects.shinyapps.io/LehighRiskScore/>.