THE CERTAINTY OF UNCERTAINTY: HEART FAILURE RISK MODELS CAN RARELY IDENTIFY PATIENTS WHO WILL DIE IN THE NEXT YEAR

Poster Contributions
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Background: Guidelines recommend the use of validated risk models in patients with heart failure (HF) to inform medical decisions. Yet, application of population-based estimates to individual patients is problematic.

Methods: Probability of survival was calculated by the Seattle Heart Failure Model (SHFM) in patients with HF 2005-2008 from 3 integrated health systems. Model covariates were collected at or before cohort enrollment; missing covariates were imputed to the median. Actual survival was determined in follow up. A resampling approach produced prediction intervals of survival function from Cox modeling.

Results: Among 10,930 patients with HF, median age was 77 years and 48% were female. NYHA, lymphocyte percent, and uric acid were not available; all remaining SHFM covariates were available for 44.8% of patients. Discrimination and calibration at 1 year were typical of HF risk modeling: c-statistic 0.66; predicted survival 89.3%, actual 84.1%. SHFM identified only 2 patients (0.02%) with >=50% probability of dying within 6 months (N=4 if NYHA set to 4) and 10 patients (0.09%) with >=50% probability of dying within 1 year (N=68 if NYHA set to 4); yet, 1,661 patients (15.2%) actually died in the year after cohort enrollment. Individual 95% prediction intervals were much wider than confidence intervals (Figure).

Conclusion: Objective risk models help refine expectations for the future, but leave wide uncertainty for individual patients and rarely identify patients with very short life expectancy.