

Appendix Table

Model	Derivation Population / Data Source	Model Derivation	How applied to HealthFacts Data
Premier, Premier+	Premier Data Warehouse, administrative and billing database with over 300 hospitals (no laboratory data, no vital signs). Selected patients identified by ICD-9 discharge code for HF plus at least one HF therapy in first 2 days.	GEE models with logit link for in-hospital mortality.	Applied intercept and parameter estimates from derivation models to compute predicted probability of mortality for each patient.
LAPS2	EHR data from Kaiser hospitals. Score derivation included all hospitalized patients (not restricted to HF).	Multi-stage algorithm using laboratory tests and vital signs to develop score used to predict in-hospital mortality.	Computed LAPS2 score for each patient and then fit GEE model including score, age, sex, race and comorbidities. Used this model to estimate a predicted probability of in-hospital mortality for each patient.
ADHERE	At 263 participating hospitals, identified patients with a primary or secondary discharge diagnosis of heart failure and abstracted medical history, management, treatments, and health outcomes.	CART method to develop decision tree for in-hospital mortality for use at the bedside. Developed a logistic regression model for use in other settings.	Applied intercept and parameter estimates from logistic regression model to compute predicted probability of in-hospital mortality for each patient.
EFFECT	Data obtained from 34 hospitals in Ontario, Canada, and Canadian Institutes of Health. Authors used principal discharge diagnosis of heart failure to identify patients. Record abstraction used to obtain vital signs and laboratory values.	Developed GEE logit models for 30-day and 1-year mortality. From models developed risk scores with points assigned for age, selected vital signs, and laboratory values.	Computed 30-day mortality risk score for each patient. Fit GEE logit model for in-hospital mortality using risk score as the predictor to compute predicted probability of in-hospital mortality.
GWTG-HF Peterson	GWTG-HF registry – participating hospitals collect and enter clinical data on HF patients. Treating physician’s diagnosis identified patients.	Multivariable logistic regression using GEE identified predictors of in-hospital mortality. Developed risk score from model.	Computed in-hospital mortality risk score for each patient. Fit GEE logit model using risk score as predictor.
GWTG-HF Eapen	Again used GWTG-HF registry data, but linked it to CMS claims data to add information on comorbidities.	Developed logistic regression model for 30-day mortality.	Fit GEE logit model for in-hospital mortality using variables included in their 30-day mortality model.