

1088. Prediction Model to Identify Patients at Risk of 30-Day Treatment Failure in Patients With *Staphylococcus aureus* Bacteremia

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Background. Clinical or microbiological treatment failure and mortality from *Staphylococcus aureus* bacteremia (SAB) remains significant. A predictive model was developed to identify patients at increased risk of treatment failure in order to improve management strategies.

Methods. Adults with monomicrobial SAB from two prospective observational cohorts were included. Treatment failure was a composite of all-cause mortality, persistent bacteremia (≥ 7 days) and recurrent bacteremia within 30 days. Candidate variables were selected *a priori* based on clinical significance and prior literature, and a parsimonious model was derived using the Akaike Information Criteria with a complete case analysis. A sum score was derived for clinical use.

Predicted probability of treatment failure using sum score

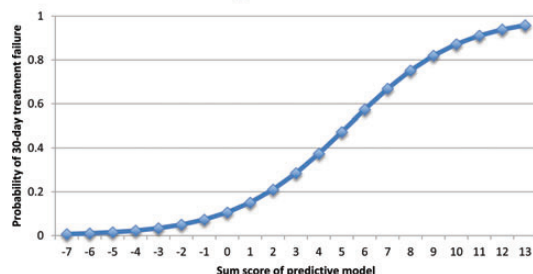


Figure 1. Predicted probability of 30-day treatment failure using sum score derived from parsimonious predictive model.

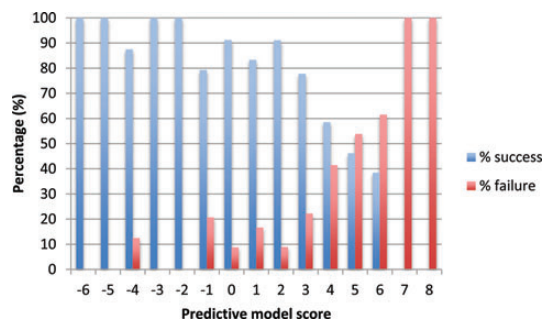


Figure 2. Performance of predictive model sum score versus observed 30-day treatment outcome.

Results. Complete data were available for 388 patients, and 20.6% experienced 30-day treatment failure. The parsimonious multivariable model identified severe sepsis, methicillin-resistant *S. aureus* (MRSA), patient age, and serum albumin as predictors of treatment failure. Model calibration (Hosmer-Lemeshow test, $p = 0.376$) and discrimination (c-statistic 0.752) indicated good performance. A prediction sum score was developed from this model (Table 1); Figure 1 shows the predicted probability of treatment failure and Figure 2 shows the sum score according to observed outcomes. The sum score performed well (c-statistic 0.750 compared with the multivariable model).

Conclusion. The combination of severe sepsis, MRSA, older patient age and lower serum albumin were predictors of 30-day treatment failure. Although some of these factors are non-modifiable, these are useful indicators for the clinician to ensure the patient receives early appropriate antibiotics and aggressive supportive care to improve clinical outcomes.

Table 1. Sum Score From Parsimonious Model to Predict Risk of 30-Day Treatment Failure

Variable	Model coefficient	Rounded coefficient	Score assigned*
Severe sepsis	1.29308	1.3	+3
MRSA	0.84871	0.8	+2
Age (per 10 year increment from age 18 years)	0.3843	0.4	+1
Albumin (per 5 g/L increment from 10 g/L)	-0.4144	-0.4	-1

*Possible range of score: -7 to +13

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