



The purpose of this study was to compare machine learning techniques for predicting central line-associated bloodstream infection (CLABSI) Parreco et al (2018).

Abstract:

**PURPOSE:** The purpose of this study was to compare machine learning techniques for predicting central line-associated bloodstream infection (CLABSI).

**MATERIALS AND METHODS:** The Multiparameter Intelligent Monitoring in Intensive Care III database was queried for all ICU admissions. The variables included six different severities of illness scores calculated on the first day of ICU admission with their components and comorbidities. The outcomes of interest were in-hospital mortality, central line placement, and CLABSI. Predictive models were created for these outcomes using classifiers with different algorithms: logistic regression, gradient boosted trees, and deep learning.

**RESULTS:** There were 57,786 total hospital admissions and the mortality rate was 10.1%. There were 38.4% patients with a central line and the rate of CLABSI was 1.5%. The classifiers using deep learning performed with the highest AUC for mortality,  $0.885 \pm 0.010$  ( $p < 0.01$ ) and central line placement,  $0.816 \pm 0.006$  ( $p < 0.01$ ). The classifier using logistic regression for predicting CLABSI performed with an AUC of  $0.722 \pm 0.048$  ( $p < 0.01$ ).

**CONCLUSIONS:** This study demonstrates models for identifying patients who will develop

CLABSI. Early identification of these patients has implications for quality, cost, and outcome improvements.

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Reference:

Parreco, J.P., Hidalgo, A.E., Badilla, A.D., Ilyas, O. and Rattan, R. (2018) Predicting central line-associated bloodstream infections and mortality using supervised machine learning. Journal of Critical Care. February 21st. .

doi: 10.1016/j.jcrc.2018.02.010.

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