

## Introduction

Acute traumatic space-occupying intracranial hemorrhage is a significant source of morbidity and mortality. In-hospital mortality risk stratification of these patients is critical for guiding aggressiveness of interventions.

## Methods

2242 patients with acute subdural or intraparenchymal hemorrhage were identified through our institution's trauma registry between 2005 and 2013. 1793 (80%) patients were randomly selected to create a training data set. Success of randomization was evaluated using difference-of-mean testing for each variable. The variables age, sex, systolic blood pressure, blood alcohol concentration, anticoagulant/antiplatelet use, hemorrhage type, presence of additional intracranial hemorrhage, Glasgow Coma Score (GCS), and injury severity score (ISS) were considered. The logistic regression containing at most 5 variables with lowest corrected Akaike Information Criterion score was selected. The remaining test set of 449 (20%) patients were stratified using this model into low (<5%), intermediate (5-30%), and high (>30%) mortality risk cohorts. The actual mortality of each cohort with 95% confidence intervals and overall concordance were calculated.

## Results

Data were successfully randomized with no significant differences found between the training and test sets. Sex, systolic blood pressure, blood alcohol concentration, and hemorrhage type were excluded. Age, anticoagulant/antiplatelet use, additional intracranial hemorrhage, and ISS were positively correlated with mortality, while GCS was negatively correlated. Mortality rates were 2.3% (0.0% - 4.4%), 11.5% (6.9% - 16.1%), and 60.2% (50.0% - 70.5%) for the low, intermediate, and high risk groups, respectively (C-statistic = 0.89).

## Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of accurate mortality prediction in space-occupying hemorrhage, 2) Discuss, in small groups, the lack of affect hemorrhage type has on mortality, 3) Identify key factors associated with mortality in space-occupying hemorrhage.

## Conclusions

This study provides a strong model for mortality risk stratification in patients with traumatic space-occupying intracranial hemorrhage as demonstrated by split-sample validation.