http://dx.doi.org/10.2106/JBJS.OA.17.00038

Appendix E-1: Regression Models

Logistic and Linear Regression Models Predicting Major Complications

$$\ln(complication) = -3.649 + 0.0754(ISS) + 0.0645(TP) + 0.0127(age) + 0.4804(NV) + 0.8236(compartment) - 0.5063(crush)$$

Eight variables were included in this regression analysis: (1) ISS, (2) age, (3) time to procedure (TP) in days, (4) presence of compartment syndrome (binary variable), (5) sex (binary variable), (6) presence of a neurovascular (NV) injury (binary variable), (7) presence of a crush injury (binary variable), and (8) hospital teaching status (tertiary variable with the following categories: community, nonteaching, and university). The presence of a crush injury (yes versus no) was included in the regression model but was not significant at p = 0.05. The p value for the Hosmer-Lemeshow model fit test was 0.09 for this logistic analysis.

Logistic Regression Model Predicting Reoperation

$$\ln(revision) = -0.9146 + 0.012(ISS) - 0.5874(community) - 0.9693(nonteach) + 0.3395(complication) + 0.2888(NV)$$

Nine variables were included in this regression analysis: (1) ISS, (2) age, (3) time to procedure in days, (4) presence of compartment syndrome (binary variable), (5) sex (binary variable), (6) presence of a neurovascular (NV) injury (binary variable), (7) presence of a crush injury (binary variable), (8) hospital teaching status (tertiary variable with the following categories: community, nonteaching, and university), and (9) presence of a major complication (binary variable). The p value for the Hosmer-Lemeshow model fit test was 0.11 for this logistic analysis.

Linear Regression Model Predicting Length of Stay (LOS)/Hospitalization

$$LOS = 1.80294 + 0.5196(ISS) + 0.5606(TP) + 0.03607(age) - 2.44097(community) - 2.74358(nonteaching) + 7.05023(Northeast) + 4.4111(compartment)$$

Eight variables were included in this regression analysis: (1) presence of compartment syndrome (binary variable), (2) sex (binary variable), (3) presence of a neurovascular injury (binary variable), (4) presence of a crush injury (binary variable), (5) fracture location (tertiary variable with the following categories: distal, shaft, and proximal), (6) hospital teaching status (tertiary variable with the following categories: community, nonteaching, and university), (7) American College of Surgeons (ACS) hospital trauma level (tertiary variable with the following categories: I, II, and III), and (8) hospital region (quaternary variable with the following categories: South, Northeast, Midwest, and West). The adjusted R-squared was 0.25 for this linear regression analysis.

http://dx.doi.org/10.2106/JBJS.OA.17.00038

Logistic Regression Model Predicting In-Hospital Mortality

$$\ln(mortality) = -5.1503 + 0.0588(ISS) + 0.0216(age) + 1.2214(compartment) + 0.4722(complication) - 0.7049(crush)$$

Nine variables were included in this regression analysis: (1) ISS, (2) age, (3) and time to procedure in days, (4) presence of compartment syndrome (binary variable), (5) sex (binary variable), (6) presence of neurovascular injury (binary variable), (7) presence of a crush injury (binary variable), (8) hospital teaching status (tertiary variable with the following categories: community, non-teaching, and university), and (9) presence of a major complication (binary variable). The presence of a major complication (yes versus no) and the presence of a crush injury (yes versus no) were included in the regression model but were not significant at p = 0.05. The p value for the Hosmer-Lemeshow model fit test was 0.87 for this logistic analysis.

Note: patient demographics, treating facility, and injury characteristics along with outcome variable covariates were selected if they were associated with an outcome variable in a bivariable logistic model with a p value of <0.2. They were retained if their respective p value did not exceed 0.25 with the addition of other variables. Major complications were considered individually and as a composite outcome variable for regression analyses. Model fit was assessed using the Hosmer-Lemeshow test[17].