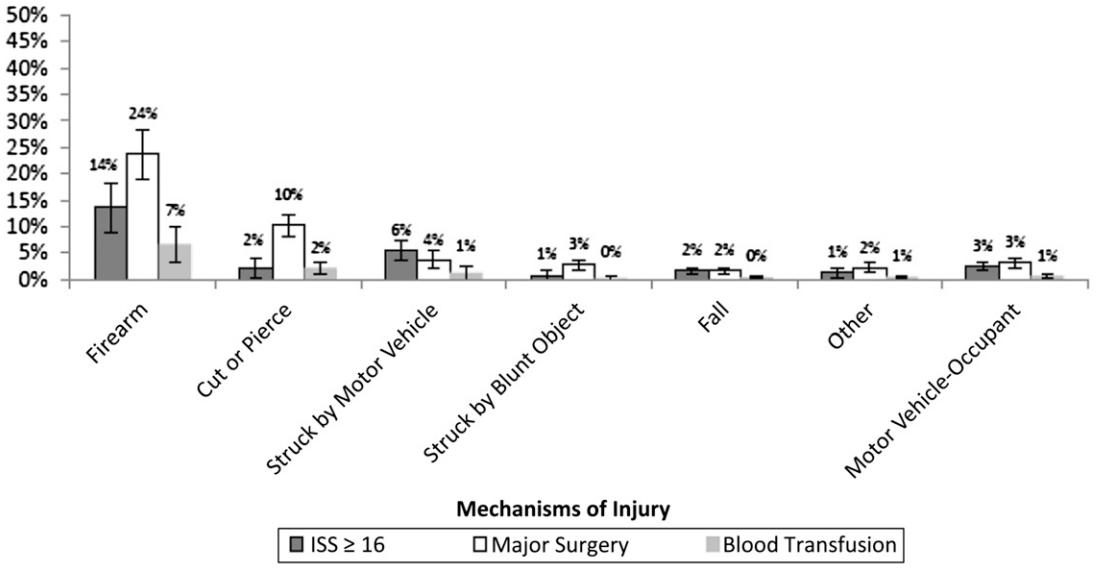
Supplemental Information

Calculation of Acute Care Costs

The average per-patient acute care costs were generated from 4 potential expenses: scene EMS transport, initial ED care (non-admitted patients), interhospital EMS transport (for patients transported to another hospital after the initial ED evaluation), and hospitalization (for admitted patients). We estimated the per-unit costs of scene and interhospital EMS transport by using median values from a sample of injured Medicare fee-for-service patients in Oregon and Washington. To estimate ED costs for non-admitted patients, we used the median facility costs from another WESTRN site (Salt Lake City, UT) for injured children (costs were not available for ED visits at other sites); these cost estimates were also compared with ED costs from Medicare patients. We converted patient-level hospital facility charges to costs by using hospital- and year-specific cost-to-charge ratios.[45,46] We estimated professional fees from facility costs by applying a conversion factor (1.27) previously calculated for injured patients by using the MarketScan database.[47] We adjusted all costs to 2008 US dollars by using a region-specific medical consumer price index.[48] We did not evaluate costs beyond the acute care period.

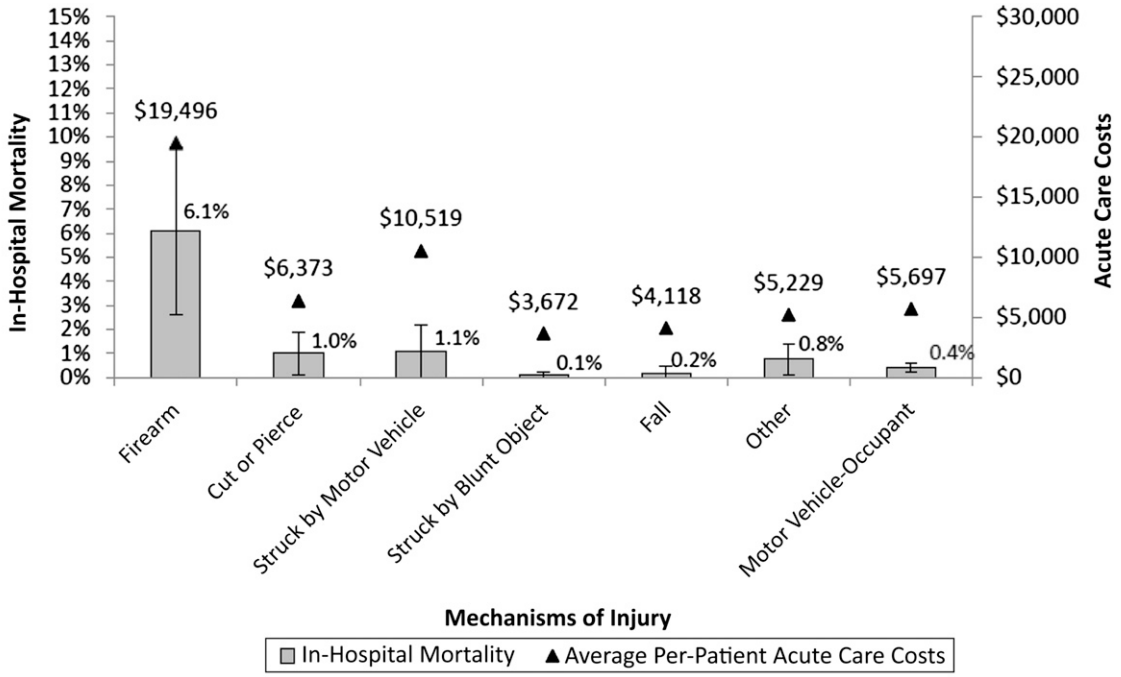
Missing Values and the Use of Multiple Imputation

We used multiple imputation[28] to handle missing values for important out-of-hospital variables. These variables included mechanism of injury (13% missing), physiologic measures (16%–29% missing), and EMS procedures (3%–8% missing). We have previously demonstrated the validity of multiple imputation for imputing missing out-of-hospital values and trauma data under a variety of conditions[43,44] and have thoroughly evaluated the use and benefit of multiple imputation in this sample.[18] We included 56 variables in the multiple imputation model, including key variables of interest and many auxiliary variables to assist in the imputation process. We then used flexible chains regression models for multiple imputation (IVEware, Survey Methodology Program, Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, MI)[49] with generation of 10 multiply imputed data sets, each analyzed independently and combined using Rubin's rules to appropriately account for variance within and between data sets.[28]



*The n = 36,644 includes all children transported by ground or air ambulance to an acute care hospital, excluding transports to a non-hospital setting (n = 500) or by law enforcement (n = 236).

SUPPLEMENTAL FIGURE 4
Injury severity and major hospital interventions among all children transported by EMS (n = 36 644).



*The n = 36,644 includes all children transported by ground or air ambulance to an acute care hospital, excluding transports to a non-hospital setting (n = 500) or by law enforcement (n = 236).

SUPPLEMENTAL FIGURE 5

In-hospital mortality and total acute care costs among all injured children transported by EMS (n = 36 644).

Owing to the importance of the mechanism of injury (MOI) variable, we conducted several additional analyses regarding handling of missing values in this term. We compared the distribution of imputed MOI values versus observed MOI values. Then we recalculated all estimates for injury severity, hospital measures, mortality, and costs by using multiple imputation to handle missing MOI values versus placing all patients' missing MOI into a separate "unknown" category. These results suggested that estimates were more conservative (lower) by using multiple imputation to handle missing MOI, so these results were retained for the primary analysis.

Sensitivity Analyses

We regenerated Supplemental Figs 4 and 5 from the primary analysis using all children transported by EMS (both matched and non-matched to a hospital record) and multiple imputation to handle missing hospital values.