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## Quadrимodal Distribution of Death after Trauma: Predictors of Death in the Fourth Peak


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## **Quadrимodal Distribution of Death after Trauma: Predictors of Death in the Fourth Peak**

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### **Introduction**

Patterns of death after trauma are changing due to diagnostic and treatment advances. We examined mortality in critically injured patients at risk of death after discharge.

### **Methods**

We reviewed all critically injured (Injury Severity Score $\geq$ 25 AND death in Emergency Room, death within 24hrs, OR ICU admission $>$ 24hrs) adults (age $\geq$ 18) admitted to a Level 1 trauma center (01/01/2000-12/31/2010) and determined death post-discharge (Social Security Death Index) of patients discharged alive. We compared demographics, injury data, and critical care resource utilization between those who died during follow-up and survivors using univariate tests and Cox proportional hazards models.

### **Results**

Of 1,695 critically injured patients, 1135 (67%) were discharged alive. As of 05/1/2012, 977 (58%) index survivors were alive (median follow-up 62mos (IQR35,96)). Of 158 deaths post-discharge, 75 (47%) occurred within the first year. Patients who died post-discharge had longer hospital (24dys (IQR13,38) vs. 17dys (IQR10,27)) and ICU LOS (17dys (IQR6,29) vs. 8dys (IQR4,19)) and were more likely to undergo tracheostomies (36.1% vs. 15.6%,  $p<0.0001$ ) and gastrostomies (39.2% vs. 16.0%,  $p<0.0001$ ) and be discharged to rehabilitation (75.7% vs. 62.5%,  $p=0.0001$ ) or skilled nursing (13.1% vs. 5.8%,  $p=0.001$ ) than survivors. In multivariable models, male sex, increasing age, and increasing ICU LOS predicted 1-year and overall mortality. ICU LOS $>$ 16dys increased risk of death at one year (HR1.94 (1.22,3.06)) and by the end of follow-up (HR2.19 (1.58,3.04)) compared to shorter ICU stays.

### **Conclusion**

We propose the first year after discharge as the fourth peak of trauma related mortality. Duration of ICU LOS during index hospitalization is associated with post-discharge mortality.

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