

Is the Pit-Stop Trauma Transfer Hazardous to Health? An Analysis of 10,870 Patients Over 20 Years of Trauma Care

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Purpose: Controversy exists within the delivery of major trauma networks between direct transfer to a Level-I trauma center or pit-stopping in local Level-II units. The potential advantage of direct transfer is the availability of experienced trauma teams to deliver specialized care, whereas some patients may require the pit stop for initial resuscitation prior to transfer. The purpose of this study is to evaluate if receiving a pit stop at a Level-II unit results in higher 30-day mortality compared to direct transfer to a Level-I center in a single UK region over 20 years.

Methods: All major trauma patients who presented at a Level-I trauma center between August 3, 1994 and November 1, 2014 were included. Comparison of 30-day mortality between trauma pit stop and direct transfer was performed with a Cox proportional hazards model. 30-day mortality was adjusted for age, sex, and ISS. Secondary analysis was performed to analyze the impact of the introduction of the regional trauma network

Results: 10,870 patients presented to the Level-I center; 2406 patients had a trauma pit stop at a Level-II unit and 8464 were direct transfers. Patients who had a trauma pit stop were younger (mean age 39 vs 47 years), had a higher median ISS (20 vs 9), and had a higher proportion of males (75% vs 62%). Unadjusted hazard ratio for 30-day mortality was 1.56 (95% confidence interval [CI] 1.35-1.80) for patients who had a trauma pit stop. After adjustment, this decreased to 1.12 (95% CI 0.97-1.30, $P = 0.12$). 1928 patients were treated after introduction of the trauma network. There was a reduction in overall 30-day mortality from 9.3 to 3.7%, with an adjusted hazard ratio of 1.66 (95% CI 1.03-2.67, $P < 0.05$) for patients who received a trauma pit stop at a Level-II unit.

Conclusion: The results of this large cohort study confirm the improvement in 30-day mortality generated by establishing a regional trauma network. In the whole cohort, the 30-day mortality is higher in patients who needed a trauma pit stop, but this effect is lost when adjustment is made for age, sex, and injury severity. Following the introduction of the major trauma network, an increased risk of death within 30 days is seen for patients transferred from trauma units, although the overall mortality has reduced significantly. This may be due to increased survival of the most severely injured patients through the provision of more specialized care.