

## Does Payment by Performance Reduce Mortality After Sustaining a Hip Fracture?

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**Purpose:** Poor national outcomes after hip fracture led to the introduction of a financial incentive in English hospitals in April 2010. Additional funding was awarded for meeting all of a set of defined process measures, known as the best practice tariff (BPT). These criteria were based on national guidelines and expert opinion. On the introduction of the BPT, the base tariff (paid irrespective of whether the criteria were met) was reduced by £110 per patient. However, if all the criteria were met, an additional payment of £445 was made. Subsequent changes increased the price differential to £1335. It was expected that with this incentive, patient outcomes would improve following a hip fracture. The purpose of this study is to assess the impact of "payment by performance" in the form of the introduction of the best practice tariff on mortality after hip fracture.

**Methods:** Data on all hip fracture admissions aged 65 years or over between April 1, 2010 and March 31, 2018 were analyzed from a local prospectively collected hip fracture database, based on the Standardised Audit of Hip Fractures in Europe. All analysis was undertaken using SPSS v24. Independent t and  $\chi^2$  tests were used to measure differences between groups. Kaplan-Meier curves were created for survival analysis, with significant difference between curves tested using the log-rank test.  $P < 0.05$  was considered statistically significant. Binomial regression analysis was performed on the baseline data to establish predictors of mortality. Baseline admission characteristics and comorbidities were used to generate propensity match scores for each patient with complete data using the FUZZY extension for SPSS. Patients who met the BPT were matched to patients who did not meet BPT in a 1:1 ratio. This is in line with previously described and published methods for propensity score matching in large medical cohort datasets. Further analysis was performed on the propensity score matched cohort.

**Results:** 5265 patients were analysed of whom 3,206 (61%) were identified as meeting the BPT criteria. Of those that did not meet BPT criteria, 1376 (67%) had a delay greater than 36 hours from admission to surgery. After propensity score matching, 2059 patients who met BPT were compared to 2059 patients who did not meet BPT. After matching, no differences in demographics persisted. Patients who did not meet the BPT were more likely to die at 30 days (7% vs 9%,  $P = 0.004$ ) and 1 year post-injury (26% vs 29%,  $P = 0.04$ ). Kaplan-Meier analysis of both baseline and propensity score matched cohorts shows significantly increased mortality in the cohort who did not meet BPT (log rank  $P = 0.001$  and  $P = 0.02$ , respectively).

**Conclusion:** Meeting the best practice tariff, particularly having surgery within 36 hours, significantly reduces 30-day and 1-year mortality in hip fracture patients. Our study demonstrates that "payment by performance" appears to improve hip fracture care.