

**Patient Predictors of Long-Term Survival After Hip Fracture: A Population-Based Study in Ontario**

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**Purpose:** This study aimed to describe long-term (10-year) survival in hip fracture patients requiring arthroplasty and to determine what patient factors are associated with 10-year survival.

**Methods:** We performed a retrospective cohort analysis of 19,659 patients over 60 years old who underwent arthroplasty for femoral neck fracture between 2002-2009 using routinely collected, validated health-care databases linked through ICES. We estimated the association between baseline variables and survival 10 years post-fracture using Poisson regression. Restricted cubic spline functions modeled the probability of 10-year survival by age and tested whether an inflection point existed after which survival decreased more rapidly. We computed marginal estimates to predict 10-year survival for different patient groups.

**Results:** 18% (n = 3564) of patients were alive at 10 years. Factors associated with higher likelihood of 10-year survival included: younger age, female sex (risk ratio [RR] 1.56, 95% confidence interval [CI] 1.46-1.68), lower American Society of Anesthesiologists (ASA) score (RR 1.96 ASA I/II versus IV/V, 95% CI 1.76-2.19), independent living status (RR 2.68, 95% CI 2.23-3.22), and fewer specific comorbidities. A threshold age of 73 years was the inflection point, after which 10-year survival decreased more rapidly in females. Estimated 10-year survival probabilities ranged from 79.0% (95% CI 75.5-82.5%) to 0.8% (95% CI 0.6-1.0%).

**Conclusion:** Approximately 1 in 6 patients with hip fracture live longer than 10 years following hip fracture. This study identifies independent baseline characteristics that are associated with survival greater than 10 years, including age <75 years, ASA I/II, and independent living status prior to hip fracture. Results can inform discussions around treatment choices, anticipated outcomes, and the natural history of hip fractures.