

## **Economic Analysis of Bisphosphonate Use After Distal Radius Fracture for Prevention of Hip Fracture: Does It Make Financial Sense?**

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**Background/Purpose:** Osteoporosis is a common condition among the elderly population, and is associated with an increased risk of fracture. One of the most common fragility fractures involved the distal radius, and prior fracture of the distal radius is associated with risk of subsequent fragility fracture. Early initiation of treatment with bisphosphonates after fragility fracture has been suggested as a means of population hip fracture burden reduction. However, there have been no prior economic evaluations of the routine treatment of distal radius fracture patients with bisphosphonates, and the implications on hip fracture rate reduction.

**Methods:** Age-specific distal radius fracture incidence, age-specific hip fracture rates after distal radius fracture with and without risendronate treatment, cost of risendronate treatment, and risk of atypical femur fracture with bisphosphonate treatment were obtained from the literature. The direct costs of hip fracture management were from the average reimbursements for DRG (Diagnosis-Related Group) 482 and CPT 27245 obtained from public Medicare databases, and anesthesia reimbursements for CPT 01230 for a 1-hour case from the Medicare pricer. A unique stochastic Markov chain decision tree model was constructed from derived estimates. The tree was analyzed with a modified Monte Carlo simulation of a cohort of women 65 and older based of 2012 US population estimates. The results were evaluated with comparative statistics, and a one-way threshold analysis performed to identify the breakeven cost of bisphosphonate treatment.

**Results:** Routine treatment of the current population of all women over the age of 65 suffering a distal radius fracture with bisphosphonates would avoid 94,888 lifetime hip fractures at the cost of 19,464 atypical femur fractures and \$19,502,834,240, or on average \$2,186,617,527 annually, which translates to costs of \$205,534 per hip fracture avoided. The breakeven price point of annual bisphosphonate therapy after distal radius fracture for prevention of hip fractures would be approximately \$70 for therapy annually.

**Conclusion:** Routine treatment of all women over 65 suffering distal radius fracture with bisphosphonates would result in a significant reduction in the overall hip fracture burden, however at a substantial cost of over \$2 billion dollars annually. To optimize efficiency of treatment either patients may be selectively treated, or the cost of annual bisphosphonate treatment should be reduced to cost-effective margins.