Osteoporosis Treatment Gaps and Risk of Recurrent Hip Fracture Following Initial Fragility Fracture: Insights from Over One Million Cases

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INTRODUCTION: Hip fractures are a significant public health concern in the United States, with an estimated annual incidence of up to 300,000 cases. As a hallmark of osteoporotic injury, a first hip fracture should prompt a comprehensive bone health evaluation and the timely initiation of osteoporosis treatment, including pharmacologic therapy, to mitigate the risk of subsequent fractures. Despite strong recommendations from multiple clinical guidelines—including those from orthopedic, rheumatologic, and endocrinologic societies—real-world rates of osteoporosis treatment initiation following hip fracture remain low, typically ranging from 16–20%, depending on the healthcare system and study population. The objective of this study was to investigate the incidence of bone-health medication initiation following a first hip fracture, as well as the incidence of second hip fractures among patients who were and were not started on these therapies, using data from Epic Cosmos—a large, aggregated, de-identified, multi-institutional dataset comprising over 290 million patients.

METHODS: Two "Cosmos hip fracture cohorts" were constructed, including all adults (≥18 years) who sustained a femoral neck, intertrochanteric, or subtrochanteric hip fracture (ICD-10: S72.0, S72.1, S72.2) between January 2019 and June 2025. One cohort consisted of patients with only a first hip fracture, and the second included patients who sustained a second hip fracture. The dataset was queried for demographic variables (age, sex, geographic location), inpatient mortality, and the use of bone-health medications. Medication use was recorded at the time of first fracture admission, six months post-fracture, and at the time of second fracture.

RESULTS:

As of June 2025, the Cosmos database included 299,800,751 patients. Among these, 1,008,595 sustained a first hip fracture, and 133,751 (13.3%) went on to sustain a second hip fracture. The mean age at first fracture was 77.0 years (64.7% female), with a mean BMI of 25.38 (SD 5.97). Racial distribution was 88.4% White, 6.7% Black/African American, 1.66% Asian, and 3.24% other. Geographically, 31% resided in the Midwest, 22.6% in the Southeast, 18.8% in the Northeast, 14.8% in the South, 11.9% in the West, and 0.9% were unspecified. In-hospital mortality following first fracture admission was 2.27% (n = 22,919). At the time of first fracture admission, 7.65% (n = 77,128) of patients self-reported bone-health medication use. Within six months post-fracture, 37.15% of patients were initiated on treatment. Only 3.0% (n = 30,624) underwent a DEXA scan as part of their post-fracture osteoporosis workup.

Among those who sustained a second hip fracture (mean interval: 416 days, SD 627), the average age was 79.0 years (SD 13.0), and mean BMI was 24.8. In-hospital mortality for the second fracture cohort was 2.85% (n = 3,813). At the time of second fracture, only 6.25% (n = 8,366) reported being on bone-health medications, and 40.1% were prescribed such medications within six months following the second fracture.

DISCUSSION AND CONCLUSION:

Despite established clinical guidelines recommending prompt initiation of osteoporosis treatment following a hip fracture, adherence remains suboptimal in real-world settings. In this large-scale, multi-institutional analysis of over one million hip fracture patients, fewer than 8% were receiving bone-health medications at the time of their first fracture, and only approximately one-third initiated therapy within six months. Alarmingly, over 13% of patients sustained a second hip fracture, with even fewer receiving pharmacologic treatment at the time of re-injury. These findings underscore a critical gap in secondary fracture prevention and highlight the urgent need for systemic interventions to improve post-fracture osteoporosis evaluation and treatment.