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Prevalence of Evaluation and Treatment of Osteoporosis After Low-Energy Hip Fractures at a Level 1 Academic Tertiary Care Trauma Center with a Multi-Disciplinary Geriatric Hip Fracture Program

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# Prevalence of Evaluation and Treatment of Osteoporosis After Low-Energy Hip Fractures at a Level 1

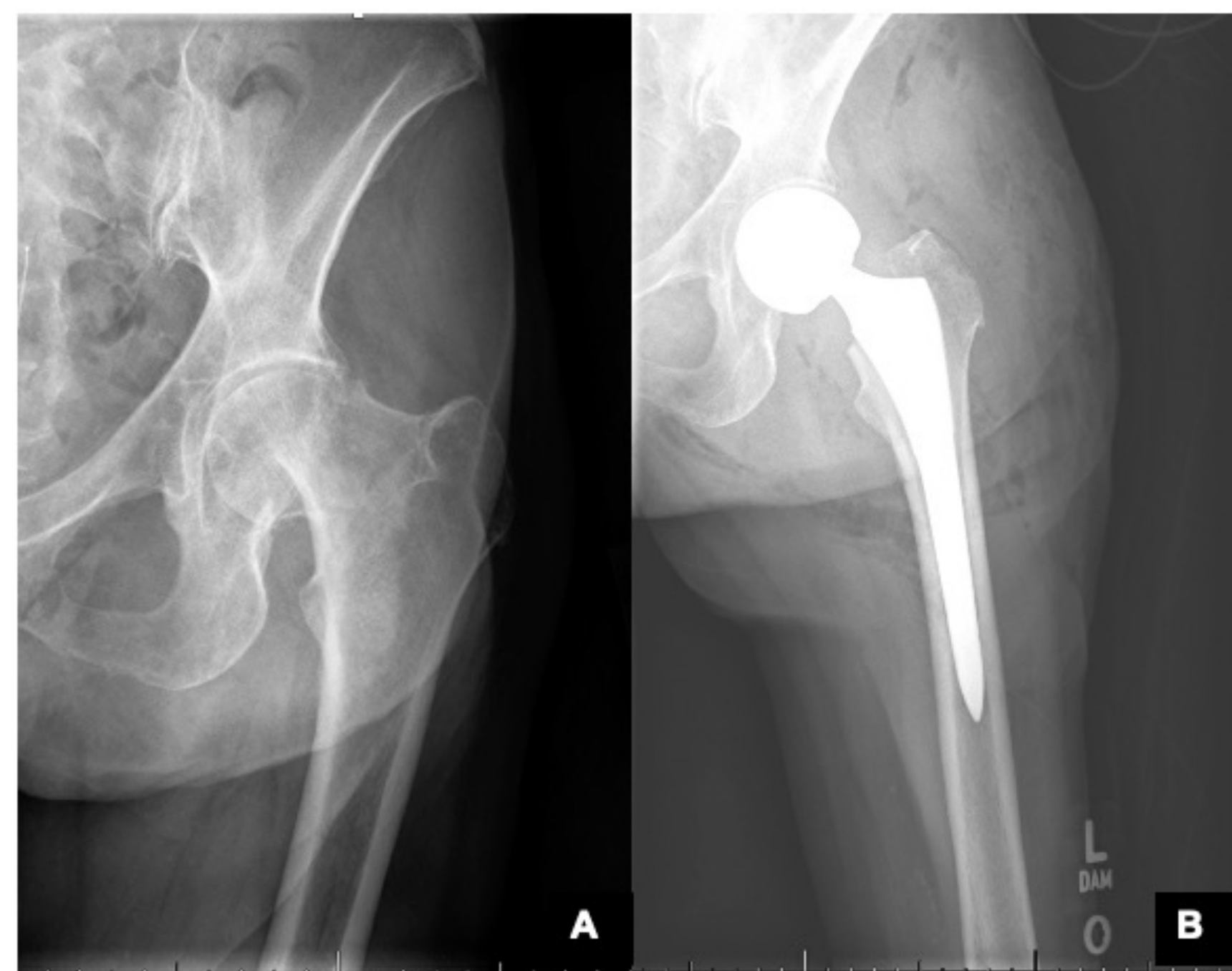
## Academic Tertiary Care Trauma Center with a Multi-Disciplinary Geriatric Hip Fracture Program

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### Introduction

- Osteoporosis is a major public health issue, with more than 53 million people in the United States either having osteoporosis or at increased risk for developing osteoporosis.
- Osteoporosis places patients at risk for fragility fractures which are associated with a decreased health-related quality of life and substantial financial burden on the healthcare system.
- Previous studies discovered a low rate of osteoporosis evaluation and treatment in adult patients after a hip fragility fracture though these studies need to be updated to determine if improvements have occurred over the last decade.
- Thus, the primary aim of this study was to evaluate rates of osteoporosis evaluation and treatment in adult patients following low-energy hip fractures.

**Figure 1**  
AP X-ray of L hip of postmenopausal female with osteoporosis significant for complete fracture of L femoral neck (A) and status post L hip hemiarthroplasty (B)



### Methods

- IRB-approved retrospective analysis - Institutional hip fracture registry was queried to identify all patients presenting with an acute hip fracture at a single level 1 trauma center from 2014 to 2020
- Inclusion Criteria:
  - ≥ 65 years old
  - Hip fracture s/p ground-level fall
  - Follow-up care with PCP's within our network
- Covariate data included: +/- DXA studies, pharmacologic therapy for osteoporosis, and endocrinology referral
- Kaplan-Meier curves were created to visualize fracture and fall probability over time and osteoporosis intervention effects

### Results

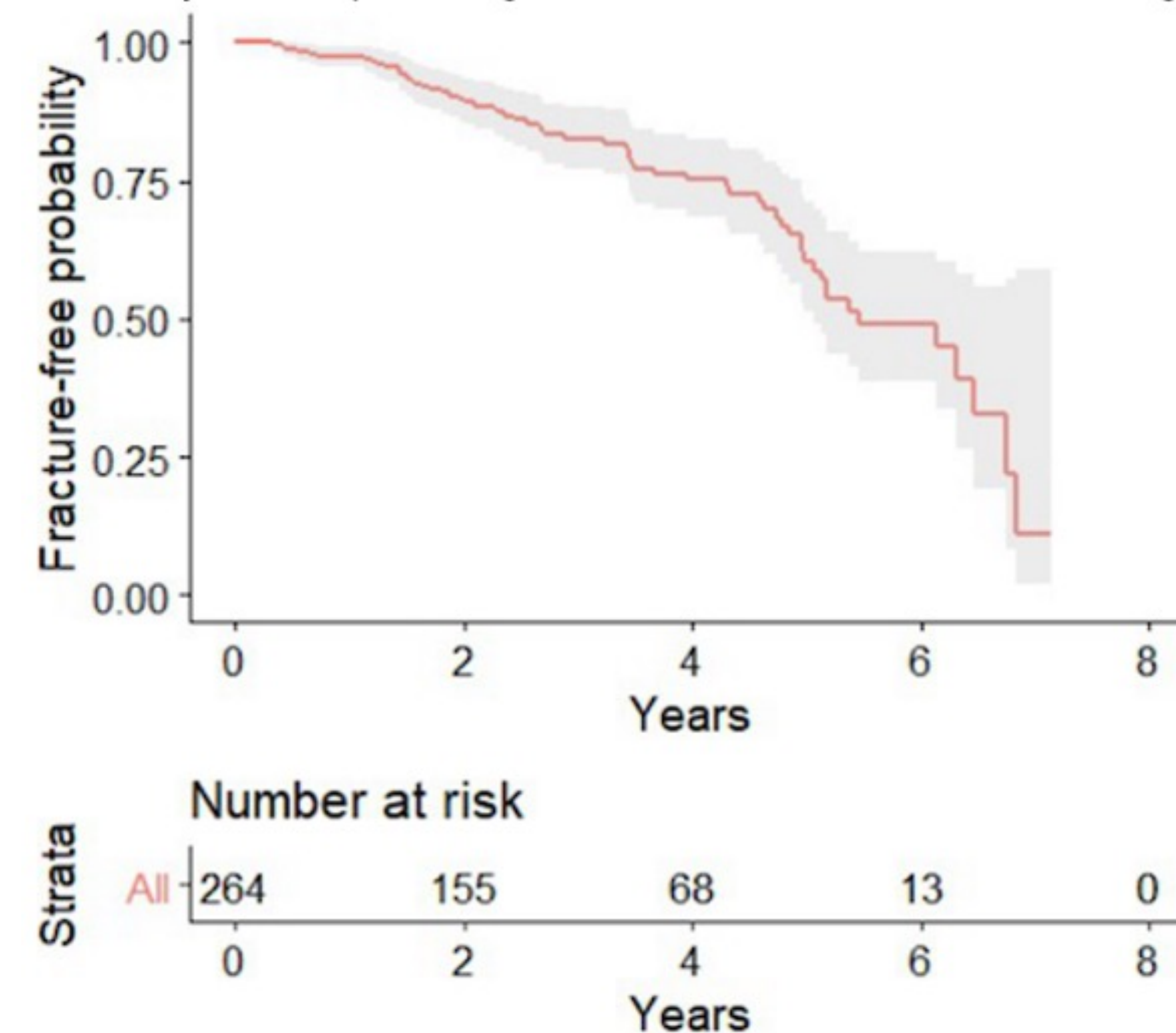
**Table 1**  
Summary of demographic and clinical data in the cohort.

Characteristic	Value
Total Patients, n	264
Mean Age (range), years	80.8 (65-98)
Females, n (%)	199 (75.1%)
Mean Body Mass Index, kg/m <sup>2</sup>	24.72 (range)
Ethnicity, n (%)	
- White	193 (72.8)
- Asian	18 (6.8%)
- Black	22 (8.3%)
- Native Hawaiian or Other Pacific Islander	2 (0.7%)
- Other	30 (11.3%)
ASA score (n=236)	
- Mean (Range)	3 (2-4)

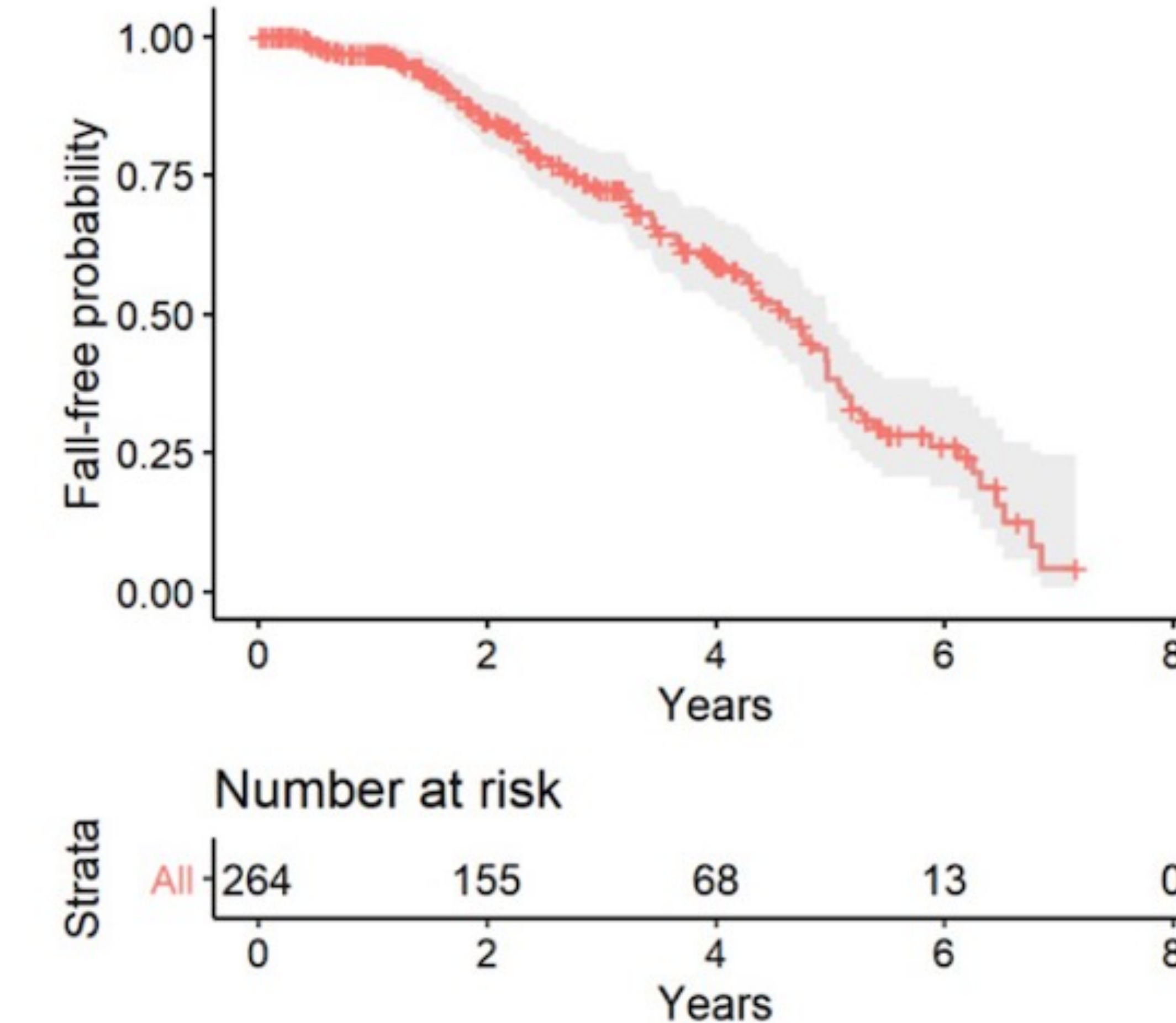
#### Clinical Outcomes

- 105 (40.4%) had at least one subsequent fall
- 61 of the 105 patients with subsequent falls sustained an additional fragility fracture because of the fall, including 19 operative injuries
- One-year mortality among the 264 patients was 7.2%, and the overall mortality rate was 28.0% at the final follow-up

**Figure 2.**  
Probability of not experiencing a fracture relative to time since discharge.



**Figure 3.**  
Probability of not experiencing a fall relative to time since discharge.



#### Osteoporosis Evaluation and Treatment

- Prior to the injury, 18 patients had DXA screening within the previous year and less than half were taking vitamin D and/or calcium
- During the initial ED visit and/or hospitalization, no DXA studies were done
- At mean final follow-up of 791 days, only 62 patients (23.5%) received pharmacologic therapy for osteoporosis and only 50 patients underwent post-injury DXA evaluation

**Table 2**  
Prevalence of interventions for osteoporosis evaluation and treatment at four time-points before, during, and after the patient's index injury.

	Pre-Injury	ED or Admission	First PCP Follow Up	Final PCP Follow Up	Total
<b>DXA</b>	18	+0	+37	+13	68/264 (25.8%)
<b>Vitamin D or Calcium</b>	100	+114	+7	+3	224/264 (84.8%)
<b>Osteoporosis Medication</b>	31	+1	+20	+10	62/264 (23.5%)
<b>Endocrinology Referral</b>	24	+3	+11	+16	54/264 (20.5%)

ED (Emergency Department); PCP (Primary Care Physician); DXA (dual-energy X-ray absorptiometry)

### Conclusions

- In our cohort, only 50 patients (18.9%) with hip fractures underwent post-injury DXA evaluation, and only 62 (23.5%) received pharmacologic therapy for osteoporosis.
- Our study demonstrates the need for improved osteoporosis workup and intervention among patients who have sustained hip fractures. This requires a multidisciplinary approach, with improved communication between spine surgeons, PCPs, and endocrinologists.
- Adoption of a dedicated fracture liaison service aimed at addressing this significant care gap represents one potentially effective quality improvement mechanism.