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Impact of Fragility Fracture Program on Osteoporosis Treatment

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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.[1]
- Several guidelines urge bone health evaluation and treatment for adults diagnosed with fragility fractures; however, two recent studies from UC Davis Health have reported sub-optimal rates of DEXA evaluation, endocrinology referrals, and osteoporosis medication use. [2]
- We sought to bridge the inpatient and outpatient osteoporosis care gap by sending a detailed letter for primary care providers (PCP) summarizing osteoporosis treatment guidelines
- Therefore, the primary aim of this study was to determine the rates of change in osteoporosis evaluation and treatment in adult patients after fragility fracture since implementation of this PCP letter system

Methods

- IRB-approved prospective analysis – From March 2021 to April 2022 patients who suffered a fragility fracture and admitted were identified and prospectively added to a single-center database
- Inclusion Criteria:
  - ≥ 60 years old
  - Fragility fracture (hip, distal radius, proximal humerus, vertebral compression) after ground-level fall
  - Follow-up care with PCP within our network
- Basic demographics were collected, and patients' charts were reviewed for DEXA imaging, endocrinology referral and prescription of anti-resorptive bone medications
- Intervention group was matched by patients extracted from our single-center database to generate control group that did not receive PCP letter
- Bivariate analysis was used to assess statistical differences between cohorts

Results

Table 1 Summary of Univariate Demographic and Clinical Data of Patients with Fragility Fractures

Characteristic	Value
Total Patients (n,%)	422
Male	120 (28.5%)
Female	302 (71.5%)
Mean Age (years, SD)	81.1 (8.58)
Body Mass index (kg/m²) (avg, SD)	24.8 (5.66)
Race, n (%)	
Hispanic	16 (3.80%)
Non-Hispanic	404 (96.2%)
Ethnicity, n (%)	
White	312 (73.93%)
Asian	44 (8.77%)
African American, Black	29 (6.87%)
Other	44 (10.43%)

Subcategory "Other" for Ethnicity corresponds to Native Hawaiian or Other Pacific Islander, American Indian/Alaska Native, and Unknown, or identified race outside of proposed categories

Table 2 Bivariate Analysis between Cohorts of Patients with Fragility Fractures

Variable	Group		P-Value
	No Letter	*Letter*	
	n	n	
Total	332	90	
Sex	92 (27.7%)	28 (31.1%)	0.53
Male			
Female	240 (73.3%)	62 (68.9%)	
Age (mean years, std dev)	81.2 (8.15)	80.7 (10.1)	0.67
Race	243 (73.19%)	69 (76.67%)	
White	25 (7.53%)	4 (4.44%)	0.24
Black			
Asian	26 (7.83%)	11 (12.22%)	
Other	38 (11.45%)	6 (6.67%)	
Ethnicity	14 (4.24%)	2 (2.22%)	0.37
Hispanic			
Non-Hispanic	316 (95.76%)	88 (97.78%)	

Note: Only 420 responses are used for Chi-Squared analysis for Ethnicity as there were 2 missing variables where patients declined to answer. Subcategory "Other" for Ethnicity corresponds to Native Hawaiian or Other Pacific Islander, American Indian/Alaska Native, and Unknown, or identified race outside of proposed categories

Table 3 Prevalence of Interventions for Osteoporosis Evaluation and Treatment by Intervention

Factor	Group		Odds Ratio	Confidence Interval	Relative Risk	Confidence Interval	P-value
	No Letter	*Letter*					
DEXA	62/332 (18.67%)	36/90 (40%)	2.9	1.75-4.80	1.32	1.12-1.54	<0.0001*
Endocrinology Referral	42/332 (12.65%)	24/90 (26.7%)	2.5	1.42-4.4	0.5	0.34-0.75	0.0012*
Vitamin D and/or Calcium	275/332 (82.83%)	63/90 (70%)	0.48	0.28-0.82	0.83	0.71-2.52	0.01*
Other Osteoporosis Meds	63/332 (19.98%)	18/90 (20%)	1.06	0.59-1.9	1.01	0.89-1.15	0.83

* indicates statistical significance with p-values <0.05. DEXA = Dual-Energy X-Ray Absorptiometry. Other Osteoporosis Medications included calcitonin and bisphosphonates.

Conclusions

- Patients are 2.9 times more likely to receive a DEXA scan after intervention and are at 1.32 times greater risk of not receiving a DEXA scan if PCP's do not receive a letter
- Patients were half as likely to have an endocrinology referral if PCP letter was not sent
- Patients who did not have a PCP letter sent were at 0.83 times greater risk to not have Vitamin D and/or Ca supplementation
- The generalizability of our study may be limited because only in-network PCPs were included and may indicate bias towards reporting higher rates of postinjury BMD evaluation and treatment
- We found a greater prevalence in osteoporosis evaluation within our in-network system following implementation of our intervention

References

1. NIH Osteoporosis and Related Bone Diseases National Resource Center: Osteoporosis overview. https://www.bones.nih.gov/sites/bones/files/pdfs/osteopoverview-508.pdf. Published October 2018. Accessed December 31 2022.
2. Haffner MR, Delman CM, Wick JB, et al. Osteoporosis Is Undertreated After Low-energy Vertebral Compression Fractures. J Am Acad Orthop Surg. 2021;29(17):741-747. doi:10.5435/JAAOS-D-20-01132.