



A Multidisciplinary Approach to Improving Secondary Fracture Prevention after Vertebroplasty: Implementing a Fracture Liaison Consultation Service



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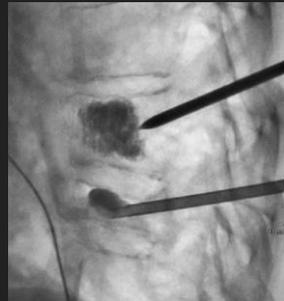


Background: Osteoporosis - Fragility Fractures

- **>250,000** hospitalizations each year for fragility fractures
- **\$70 billion** in annual medical costs from osteoporosis
- Vertebroplasty is an effective treatment when conservative measures fail
- However the risk of a secondary fracture is up to **25%** over 10 years.
- This can be reduced by **30-50%** with osteoporosis treatment.

Amin S, Achenbach S, Atkinson E, Khosla S, Melton L. Trends in fracture incidence: A population-based study over 20 years. *J Bone Miner Res.* 2014;29(3):581-589.

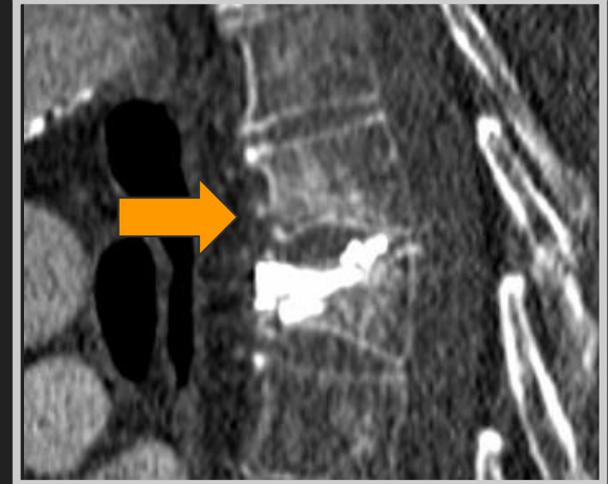
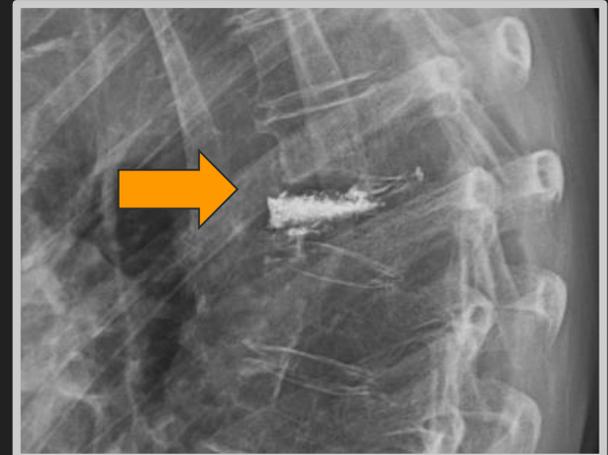
Hodsman AB, Leslie WD, Tsang JF, Gamble GD. 10-Year Probability of Recurrent Fractures Following Wrist and Other Osteoporotic Fractures in a Large Clinical Cohort. *Arch Intern Med.* 2008;168(20):2261.



An all too common scenario....

75-year-old woman with new back pain 6 months after successful thoracic vertebroplasty → new fracture

If osteoporosis treatment reduces the risk of secondary fracture, [why are so few patients being treated?](#)



Prior to intervention, only **17%** of vertebroplasty patients at our institution were started on best available osteoporosis therapy within 6 months¹

1. Albanese G, Bice M, Anderson PA, Hare K, Ross AB. *A Multi-Disciplinary Approach to Improving Secondary Fracture Prevention after Vertebroplasty* High Value Practice Academic Alliance Annual Meeting. Baltimore, MD. September 21, 2018.



Objectives:

- Develop a system for referring vertebroplasty patients for secondary fracture prevention treatment
- **Short term:** Evaluate success of the referral system in getting patients seen for osteoporosis care.
- **Long term:** Evaluate whether this leads to fewer secondary fractures



Methods: The “Fracture Liaison Service” (FLS)

2009 - American Orthopedic Association launches “Own the Bone” Campaign - Web-Based Initiative designed to reduce Fragility Fractures

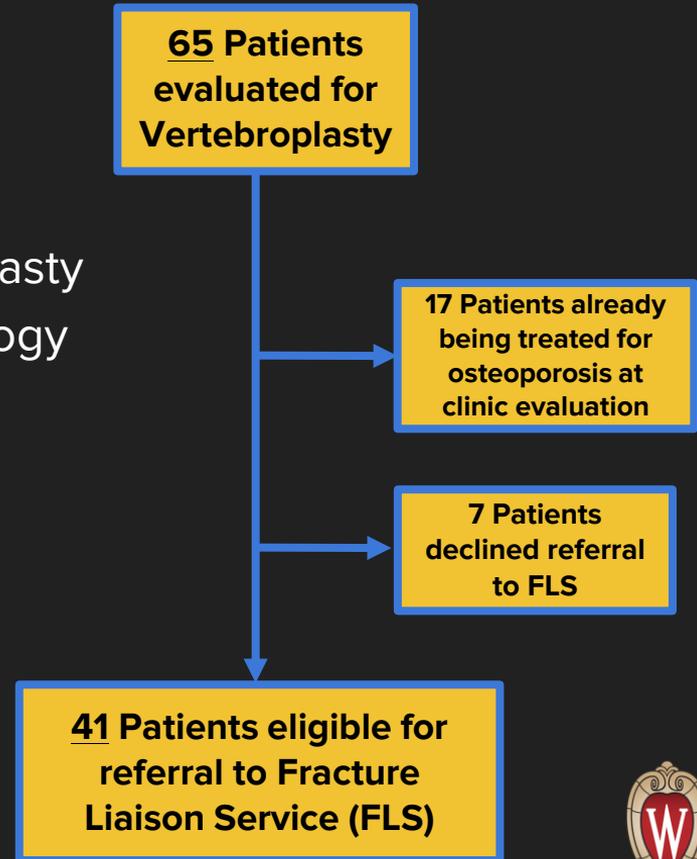
2017 - PA-C hired at our institution through the Department of Orthopedic Surgery & Rehabilitation within the Department of Endocrinology

- Formal Osteoporosis Diagnosis
 - Imaging - Bone Mineral Densitometry (DEXA)
 - Laboratory/Biochemical Evaluation
- Counseling: Nutrition, Physical Activity, Lifestyle
- **Treatment:** Pharmacotherapy, Physical Therapy
- Follows patient for one year → turns over treatment to primary care



Methods: Patient Referral

- Referral program to Fracture Liaison Service (FLS) started 3/1/2017
- **65 consecutive patients** evaluated for vertebroplasty for fragility fractures in our musculoskeletal radiology clinic from 3/6/2017 through 10/23/2018
- **Outcomes:**
 - Demographics
 - % Referred to Fracture Liaison Service (FLS)
 - % Seen in Fracture Liaison Clinic (FLS)
 - % of patients who's therapy was modified
 - Baseline data on secondary fractures



Results: Patient Demographics

65 patients evaluated for Vertebroplasty for Fragility Fractures in our Musculoskeletal Radiology Clinic from 3/6/2017 through 10/23/2018

Age

Average 71.6 years
Range 54-93

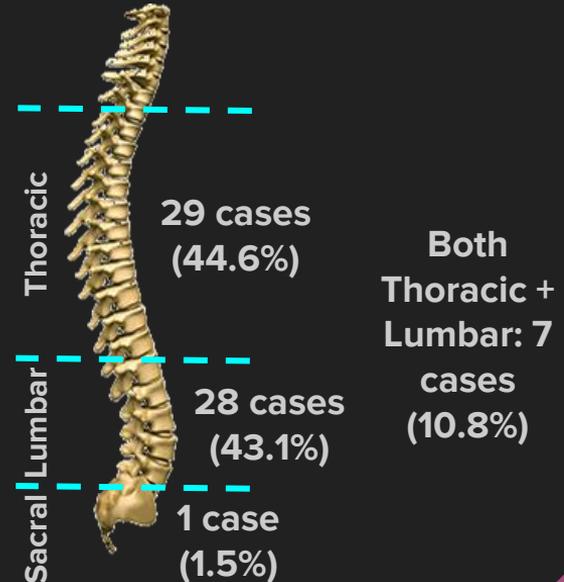
Number of Levels Treated



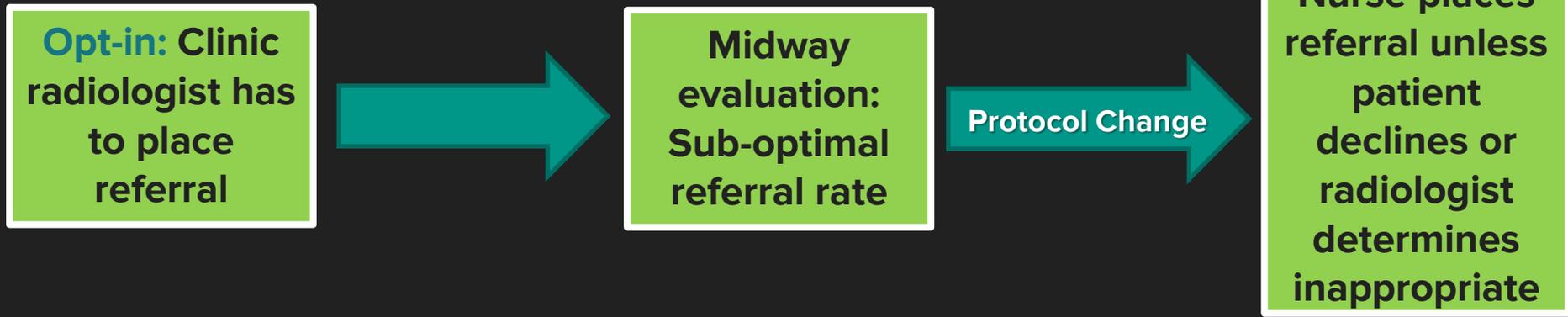
Average 1.25 levels
Range 0 - 4 levels



Treatment Level



Results: Referral Rates to Fracture Liaison Service



Results: Patient Referral Patterns to FLS

	Referred to FLS	
	Yes	No
Opt-in Pathway	22 (64.7%)	12 (35.3%)
Opt-out Pathway	6 (85.7%)	1 (14.3%)

Before FLS Program:

Only **17%** of patients were started on Osteoporosis therapy *within 6 months* of Vertebroplasty clinic evaluation

Patient Evaluated in FLS Clinic	
Yes	20 (57.1%)
No	15 (42.9%)

Was Osteoporosis Therapy Modified by FLS Provider?	
Yes	18 (81.8%)
No	4 (18.2%)



Results: Secondary Fractures, baseline data

Presence of Secondary Fracture (through period of study)	
Yes	9 (13.9%)
No	56 (86.1%)

Was Secondary Fracture an <i>Adjacent-Level Fracture?</i>	
Yes	8 (88.9%)
No	1 (11.1%)

Adjacent-Level Fracture

(ALF):

Secondary fragility fracture that occurs after a vertebroplasty.

- Patients undergoing vertebroplasty are **at a higher risk for secondary fracture**
- It is most likely to occur at an adjacent level



This will provide a foundation for further research looking for decreased incidences of secondary/adjacent level fractures with improved secondary prevention therapy



Discussion

- At baseline, few vertebroplasty patients are treated with best medical management for osteoporosis for secondary fracture prevention
- A formal referral system drastically increases the likelihood of patients being treated for osteoporosis after vertebroplasty
- A default to referral system where clinic staff place an osteoporosis consult unless the patient declines or radiologist defers increases referral rates
- The majority of patients seen in clinic required modification to their osteoporosis therapy
- Previous literature suggests this will decrease the rate of secondary fractures¹
- Appointment compliance was low for referred patients

¹Huntjens K, Van Geel T, Van Den Bergh J, et al. Fracture liaison service: Impact on subsequent nonvertebral fracture incidence and mortality. *J Bone Jt Surg - Ser A*. 2014;96(4):e291-e298.

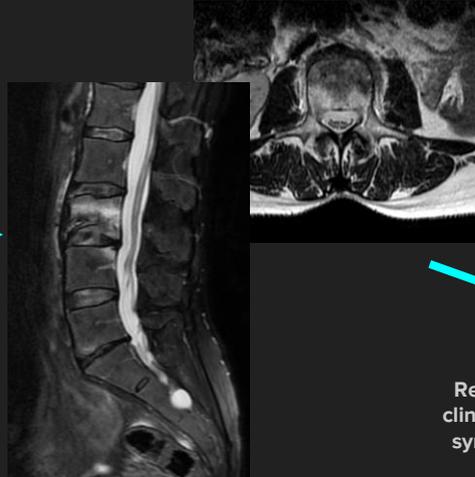


Case Example: 54 year old woman after a fall

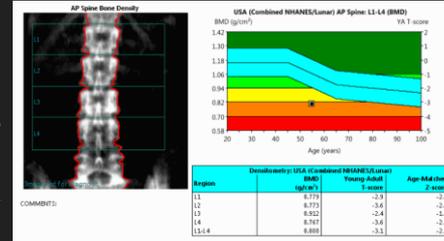
Evaluated in Orthopedic Surgery clinic for continued pain after a fall from standing, lateral lumbar spine radiograph demonstrates an L3 compression fracture



Subsequent MRI demonstrates continued edema at L3 on Sagittal STIR and Axial T2 sequences; further evaluates fracture morphology

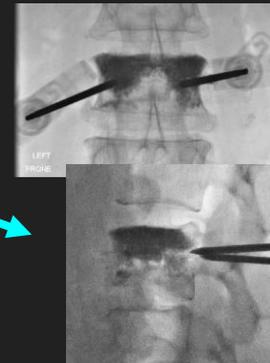


Referral placed - Patient seen in FLS Clinic



DEXA confirms diagnosis of osteoporosis, patient initiated on appropriate pharmacotherapy with follow-up

Referral to Vertebroplasty clinic confirming concordant symptoms; Vertebroplasty performed



No further fractures, positive clinical result and pain improvement for the patient



Conclusions

- The fracture liaison consultation service (FLS) is an easy and important referral-based multidisciplinary clinic to provide patients with the resources to diagnose, treat, and manage osteoporosis to improve bone health & prevent future vertebral body fragility fractures
- Patients referred to the fracture liaison service (FLS) show improved referral rates, compliance with follow-up, and more appropriate therapy regimens
- Data is still being collected to determine if this pathway leads to an improved incidence in Secondary and Adjacent-Level Fractures

Thanks for your attention!

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