

# Implementation of a Mandatory Rheumatology Osteoporosis Consultation in Patients With Low-Impact Hip Fracture

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**Background:** Osteoporosis remains an underdiagnosed and undertreated major health problem. The current treatment rate for patients who have experienced at least 1 osteoporotic fracture is 20%–25%. Therefore, the Rheumatology and Internal Medicine Departments of Ochsner Clinic Foundation New Orleans implemented a mandatory rheumatology osteoporosis consult as part of preprinted admission orders for all patients after hip fracture surgery on the Internal Medicine service.

**Methods:** We conducted a retrospective study of 78 patients admitted with a low-impact hip fracture between June 2004 and July 2005. These patients were seen by the rheumatology service in the hospital after hip fracture repair (exposed group). Osteoporosis evaluation was performed based on an interview questionnaire. Seventy-eight age-matched patients previously admitted for low-intensity or low-impact hip fracture in 2002–2003 but not exposed to the mandatory rheumatology consult served as our comparison group. Pearson  $\chi^2$  test was used for statistical analysis.

**Results:** Mean patient age was 80 years. Of the 78 unexposed patients, 17 (22%) were on treatment (calcium, vitamin D, hormones or antiresorptive agents) before the hip fracture, and 18 (23%) were on treatment after fracture repair. Of the 78 patients exposed to the compulsory rheumatology consultation, 34 (44%) patients were receiving osteoporosis treatment before hip fracture and 75 (96%) patients were receiving treatment after fracture repair. Of the patients not treated before hip fracture repair, there was a significant increase in the percent treated for those patients exposed to the rheumatology consult versus those not exposed (97.6% vs. 2.4%, respectively,  $P < 0.0001$ ).

**Conclusions:** In our institution, we were successful in identifying and initiating appropriate therapy for osteoporosis patients through an automatic rheumatology osteoporosis consultation after hip fracture. The implementation of a mandatory osteoporosis consult resulted in a statistically significant increase in treatment of the exposed group compared with the unexposed group.

**Key Words:** osteoporosis, hip fracture

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Osteoporosis is a growing problem worldwide related to aging of the population. In the United States, more than 1.5 million osteoporotic fractures occur annually with an annual direct care cost of nearly \$18 billion.<sup>1</sup> The current treatment rate for patients who have experienced an osteoporotic fracture is 20%–25%.<sup>2</sup>

Of all osteoporosis-related fractures, hip fracture is associated with the highest mortality, morbidity, and economic expenditure. In the United States, an estimated 340,000 hip fractures occur each year.<sup>3,4</sup> The 1-year mortality rate after a hip fracture has been reported to be between 17% and 31% and is highest during the first 3 months after fracture.<sup>5,6</sup> Patients with a prior hip fracture and osteoporosis have a 20-fold risk of future fracture.<sup>7</sup>

Despite this, patients who sustain a hip fracture are underdiagnosed and undertreated. Retrospective studies carried out in different institutions reveal that only 6%–10% of patients who experience a low-energy osteoporotic hip fracture receive pharmacologic osteoporosis therapy after fracture at the time of discharge.<sup>8–16</sup> It is therefore very clear that despite significant improvements in osteoporosis diagnosis and treatment, interventions are needed to improve the treatment of osteoporosis after a hip fracture to prevent future fractures.

## PATIENTS AND METHODS

Eighty-five consecutive patients admitted to Ochsner Medical Center in New Orleans with a low-impact osteoporotic femoral neck or intertrochanteric fracture between June 2004 and July 2005, while on a post-hip fracture repair internal medicine service, were considered for inclusion in the study to constitute the group exposed to a mandatory rheumatology consult, after approval by the Ochsner Clinic Foundation Institutional Review Board. Patients with high-impact injury, trauma, death, or pathologic fractures were excluded. Seven patients were excluded from the study results (3 pathologic malignancy-related fractures, 1 death, 1 motor vehicle accident, 1 Paget disease, and 1 preexisting

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spinal cord injury), leaving 78 patients who underwent a mandatory rheumatology consult. The rheumatology osteoporosis consult was conducted in hospital during recovery from hip fracture repair and included history and physical examination, osteoporosis risk factor review, medication review, review of prior BMD testing, relevant laboratory examinations, and treatment recommendations. A standardized osteoporosis questionnaire was used mainly as a checklist by the interviewing physician. After evaluation, recommendations were made regarding calcium, vitamin D, and pharmacologic osteoporosis therapy. Patients were routinely transferred to a rehabilitation unit for continued care postoperatively. Bisphosphonates were prescribed while in hospital if endoprosthesis was performed but were recommended to be given 2 months after surgery during clinical follow-up in patients who have undergone open reduction internal fixation, to allow fracture healing. The patients requiring DXA were scheduled to have the test at the time of their 2-month postsurgical follow-up with rheumatology. Calcium and vitamin D doses were adjusted or started routinely while in hospital. Seventy-eight age-matched patients admitted for low-intensity or low-impact hip fracture in 2002–2003, also on a post-hip fracture internal medicine service but not exposed to the rheumatology consult, served as our comparison group. Communication with the patients' primary care physicians and retrospective follow-up chart review were conducted to check if patients were actually taking the recommended therapy in both the exposed and unexposed groups.

### Statistical Analysis

Statistical analysis was performed to answer the following question: For patients not treated for osteoporosis before hip fracture repair, did exposure to a rheumatology consult immediately after hip fracture repair result in a significant increase in treatment of osteoporosis compared with those who did not receive a mandatory rheumatology consult after fracture? Pearson  $\chi^2$  test of independence was used.

### RESULTS

For the patients exposed to the consult, mean age was 80.9 (range, 54–99) and 56 (72%) were women. For patients not exposed to the consult, mean age was 79.9 (range, 46–98) and 60 (77%) were women. There was no statistical difference between the 2 groups with regard to age or gender (Table 1). Of the 78 nonexposed patients, 17 (22%) were on treatment (calcium, vitamin D, hormones, or antiresorptive agents) before the hip fracture. Of the 78 exposed patients, 34

**TABLE 1.** Baseline Patient Characteristics

	Unexposed	Exposed	<i>P</i>
Total patients, N	78	78	
Age (yr)	79.9	80.9	0.20
Sex			0.46
Female, n (%)	60 (77%)	56 (72%)	
Male, n (%)	18 (23%)	22 (28%)	

**TABLE 2.** Comparison of Osteoporosis Treatment After Repair for Low-Impact Fracture Among Patients Exposed Versus Not Exposed to Rheumatology Consult

	Exposure to Rheumatology Consult		<i>P</i>
	Yes	No	
Treatment	41	1	
No Treatment	3	60	0.0001 ( $\chi^2 = 89.25$ )

(44%) patients were receiving osteoporosis treatment before hip fracture.

For those patients who were not on treatment of osteoporosis before fracture, exposure to mandatory rheumatology consult resulted in a significant increase in treatment when compared with nonexposed patients, 97.6% vs. 2.4%, respectively ( $P < 0.0001$ ) (Table 2).

### DISCUSSION

Osteoporosis and osteoporosis-related fractures remain among the top public health problems worldwide. Using the World Health Organization's quantitative definition of osteoporosis based on bone density measurement, there are approximately 10 million individuals older than 50 years in the United States with osteoporosis and another 34 million with low bone mass/osteopenia.<sup>17</sup> If left undiagnosed and untreated, the prevalence of osteoporosis and osteoporosis related fractures will increase significantly. By 2010, roughly 12 million individuals older than 50 years are expected to have osteoporosis and another 40 million to have osteopenia. Osteoporosis also takes a significant financial toll on the society. Direct care expenditures for osteoporotic fractures alone range from \$12.2 to \$17.9 billion each year, measured in 2002 US dollars.<sup>17</sup>

Tremendous improvements in awareness of the disease have been achieved within the past 5 years. Information on diagnosis of osteoporosis by means of a DXA scan has been promulgated. The multiple risk factors for osteoporosis have been defined. Numerous effective drug treatments and regimens have been approved. However, despite all these advances, very few patients are actually receiving treatment. The current treatment rate for patients who have experienced an osteoporotic fracture is 20%–25%.<sup>2</sup>

Of all osteoporosis-related fractures, hip fracture is associated with the highest mortality, morbidity, and economic expenditure. In the United States, an estimated 340,000 hip fractures occur each year.<sup>3,4</sup> The 1-year mortality rate after a hip fracture has been reported to be between 17% and 31% and is highest during the first 3 months after fracture.<sup>5,6</sup> Patients with a prior hip fracture and osteoporosis have a 20-fold risk of future fracture.<sup>7</sup> Hip fracture is also the primary cause of morbidity when compared with other types of fractures. The most important long-term impairment is in the ability to walk: about 20% of patients are nonambulatory even before fracture, but of those who are able to walk, half cannot do so independently afterward.<sup>18</sup> Among women who lived independently before hip fracture, about half remain in

long-term care or need help with activities of daily living a year after the event.<sup>19</sup>

Despite this, patients who sustain a hip fracture are underdiagnosed and undertreated. Retrospective studies carried out in different institutions reveal that only 6%–10% of patients who experience a low-energy osteoporotic hip fracture receive pharmacologic osteoporosis therapy after fracture at the time of discharge.<sup>8–15,20,21</sup> It is therefore very clear that despite significant improvements in osteoporosis diagnosis and treatment, interventions are needed to improve the treatment of osteoporosis after a hip fracture to prevent future fractures.

Aging of the population is one of the most important, uncontrollable, and powerful independent risk factors for future fractures. Increasing age is also associated with a reduced likelihood of receiving osteoporosis treatment.<sup>10</sup> The increasing age of our population coupled with the undertreatment of disease makes osteoporosis a very serious medical health problem that needs an immediate solution.

Evidence from randomized controlled trials and meta-analyses supports the efficacy and safety of oral bisphosphonates as first-line pharmacologic agents for the prevention and treatment of osteoporosis.<sup>22</sup> Each case enrolled in our study underwent evaluation for bisphosphonate therapy; if they were not deemed candidates for such, because of adverse effects or medical conditions that preclude its use (end stage renal disease, swallowing problems, dementia), other FD-approved therapies for osteoporosis were instituted.

Our data showed that implementation of a mandatory rheumatology consult for osteoporosis evaluation and management was effective in increasing the percentage of patients who were identified and given appropriate treatment. Before our proposed mandatory consult for this particular group of patients, only 2.4% of the nonexposed patients who were not on osteoporosis treatment before hip fracture repair were receiving appropriate treatment after hip fracture repair. This increased to 97.6% after our program was implemented.

The prefracture rate of treatment at the time (2004–2005) the program was implemented was comparably higher than at the time for the comparison group (2002–2003), (44% vs. 22%, respectively). Multiple factors could account for this. One would be increased understanding and awareness of osteoporosis due to physician and patient education, increased utilization of BMD greater familiarity with treatment options, and a greater understanding of their appropriate use, both pharmacologic and nonpharmacologic. Even though the prefracture rate of treatment was higher in the exposed group when compared with that in the nonexposed group, exposure to the rheumatology consult resulted in a significant increase in percentage of patients treated after fracture repair. A multidisciplinary, patient-centered approach and collaboration between primary care physicians and subspecialists played an important role in the success of this strategy. In our

estimation, another factor that contributed to the success was direct patient education regarding osteoporosis and effective available treatments.

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