Recommendations for Care of the Osteoporotic Fracture Patient to Reduce the Risk of Future Fracture

Developed by the World Orthopedic Osteoporosis Organization (WOOO)
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Orthopedic surgeons and osteoporosis: Action is needed to identify and treat osteoporotic fracture

Fragility fractures resulting from low trauma events such as a fall from standing height are associated with osteoporosis and are very common in older people. Patients with osteoporotic fractures are among the highest risk patients for further osteoporotic fractures, often within 1 year of the fracture. Therefore, potential underlying skeletal fragility should be evaluated and treated to reduce this risk.

Orthopedic surgeons are usually the first, and often the only, physicians to see fracture patients. Consequently, he/she has a unique opportunity to serve as the primary advocate for ensuring the patient is evaluated for osteoporosis and treated to reduce the risk of subsequent fracture.

I. Why should the orthopedic surgeon be concerned?

- Fractures related to osteoporosis are very common.
  - Up to 50% of women and 30% of men will experience an osteoporotic fracture during their lifetime.

- The most common sites of fragility fracture are: vertebrae, wrist (Colles fracture), hip, and proximal humerus.

- Osteoporotic fractures are associated with increased morbidity and mortality.
  - Up to half of hip fracture patients will have long-term disability, and 25% will require long-term nursing home care.

- A prior (or recent) fracture is one of the strongest risk factors for future fracture, increasing the risk of subsequent fracture as much as five fold.
  - Additional fractures often occur within a year after a vertebral fracture.

II. What is osteoporosis?

A systemic skeletal disease characterized by progressive age-related loss of bone strength that leads to increased fracture risk, sometimes with devastating consequences.

- Bone mineral density (BMD) serves as a clinical indicator of bone strength and accounts for 60-80% of whole bone strength.
  - BMD measurements are often expressed as a "T-score," representing the number of standard deviations (SD) the patient's BMD is above or below the peak bone mass of a healthy young adult of the same sex.
- World Health Organization (WHO) definitions:
  - Osteoporosis: In the absence of a fracture osteoporosis is defined as a BMD more than 2.5 SD below that of a young normal adult (T-score $\leq$ -2.5). A T-score $\leq$-2.5 in the presence of one or more fractures is considered severe or "established" osteoporosis.
  - Low Bone Mass: A T-score between -1.0 and -2.5.
  - The WHO criteria are intended to facilitate diagnosis, rather than to serve as guidelines for treatment, and they should not be used as the sole determinant of treatment decisions. Treatment decisions should be most aggressive for those who have already suffered a fragility fracture, because of the increased risk of subsequent fractures, independent of BMD. In fact, some recommend treatment of patients who have had a hip or spine fracture, even if BMD is not measured.
- The presence of both low BMD (or osteoporosis) and a previous fracture is associated with dramatically increased risk of fracture — more than either risk factor alone.

III. Recommendations For Assessing Patients With Fractures

- All patients >50 years old presenting with fragility fracture should be evaluated for osteoporosis by measurement of bone density, if this is available. In the oldest, such as a hip fracture patient over 80, a BMD measurement is not always nessery
- The evaluation may be done by the orthopedic surgeon, or he/she may refer the patient to a physician who is knowledgeable about osteoporosis (Figure 1).

Figure 1. Algorithm for evaluation of patients with fragility fractures.

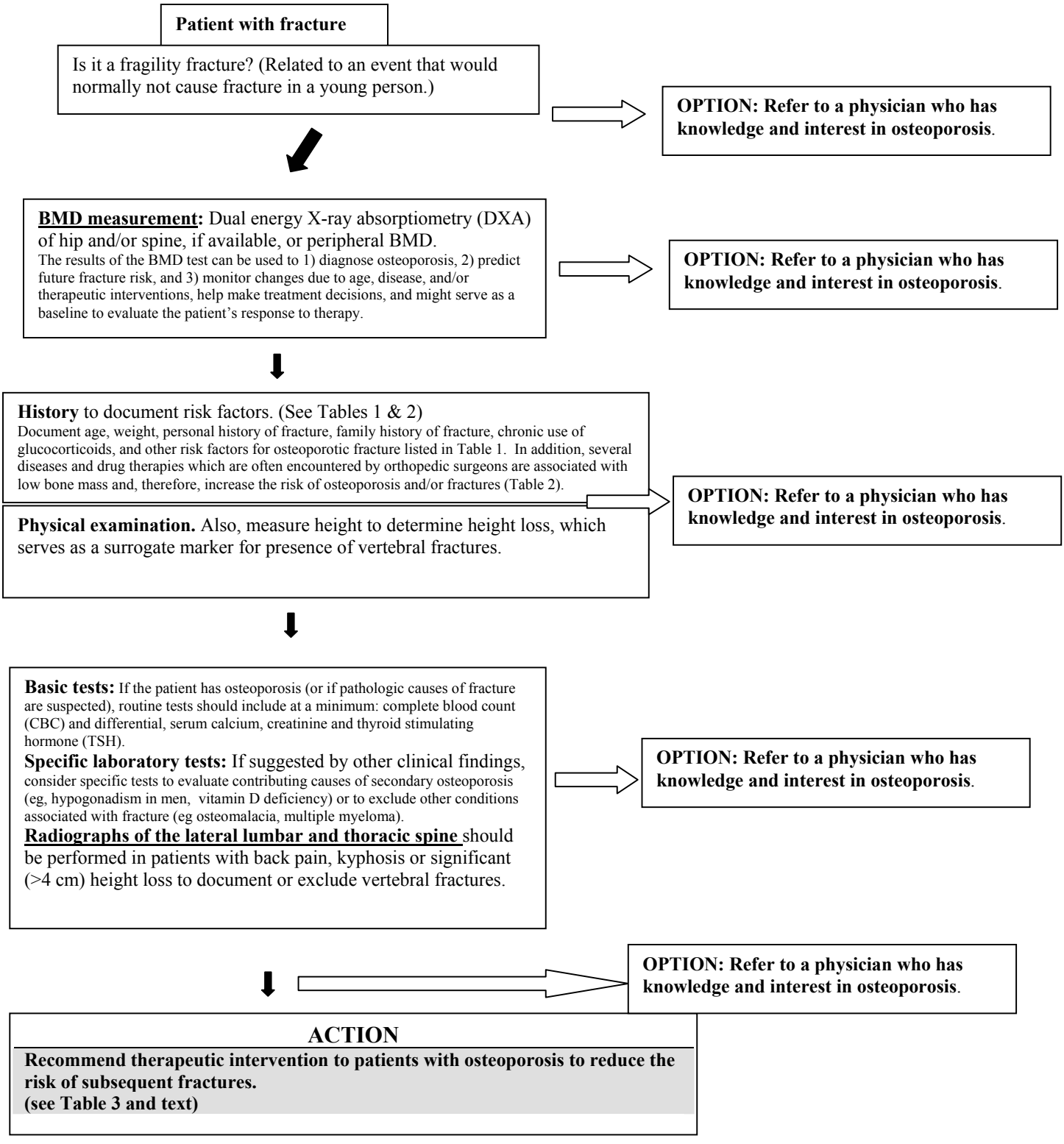

Table 1. Risk Factors for Osteoporotic Fracture*

Not Modifiable	Potentially Modifiable
Personal history of adult fracture	*Low BMD*
History of fracture in first-degree relative	*Current cigarette use*
	Low body weight
Caucasian and Asian race	Estrogen deficiency including menopause onset <45 years
	Oral glucocorticoid use
Advanced age	Alcoholism
Female sex	Life long low calcium intake
	Recurrent falls
Dementia	Little or no physical activity
Poor health/frailty	Discontinuation or non-compliance of antiresorptive therapy
	Reduced visual acuity

*Adapted from National Osteoporosis Foundation Physician's guide to Prevention and Treatment of Osteoporosis, Belle Mead, NJ Excerpta Medica, Inc. 1998. Italics denote risk factors that are key factors for risk of hip fracture, independent of bone density.

Table 2. Examples of diseases and drugs associated with an increased risk of generalized osteoporosis and/or fractures in adults commonly encountered by orthopedic surgeons.*

Diseases	Drug Therapies
Ankylosing spondylitis	Excess thyroid medication
Insulin-dependent diabetes mellitus	Oral glucocorticoids
Multiple sclerosis	Prolonged use of heparin
Nutritional disorders (esp. Vit D deficiency)	Tamoxifen (premenopausal use)
Osteogenesis imperfecta	Sedative-hypnotics
	Antideprssants
Renal disease	Immunosuppressants
Rheumatoid arthritis	Testosterone antagonists

* Adapted from the National Osteoporosis Foundation Physician's Guide to Prevention and Treatment of Osteoporosis, Belle Mead, NJ Excerpta Medica, Inc. 1998.

IV. Who to treat?

- Any patient with osteoporosis should be treated to reduce the risk of new fractures, unless treatment is contraindicated.
- Criteria for diagnosing osteoporosis and for making decisions about pharmacologic treatment for patients both with and without fracture are generally consistent, but do vary somewhat from country to country. The surgeon should become familiar with any existing region-specific guidelines for managing patients with osteoporotic fracture.

V. How to treat?

- Encourage ALL fracture patients to:
  - Maintain an adequate intake of calcium (≥1000 mg/day) and vitamin D (400 to 800 IU/day)
  - Participate in regular weight-bearing exercise
  - Avoid tobacco use
  - Limit alcohol intake
  - Recommend pharmacological intervention for patients with osteoporosis: There is clear evidence that several antiresorptive agents reduce fracture risk by as much as 50% in women with osteoporosis (identified by low hip or spine BMD or presence of vertebral fracture) (Table 3):
    - Alendronate and risedronate (bisphosphonates) reduce fracture risk at all sites including the hip and spine. Studies on new bisphonates has started
    - Raloxifene (a Selective Estrogen Receptor Modulator, SERM) reduces vertebral fracture risk, but not other types of fractures
    - WHI (Women's health initiative) showed that HRT (estrogen + progesterone) reduces fracture risk, but is associated with increased cardiovascular disease and breast cancer.
  - There is less evidence of antifracture efficacy for other agents, including fluoride, etidronate (a bisphosphonate), and calcitonin. These are not considered first line agents for fracture patients.
  - PTH is not approved but have shown a fracture reduction

Table 3. Certain treatments are effective for reducing fracture risk among women with osteoporosis. *

Antiresorptive Agent	Fracture Type		
	Vertebral	Hip	Nonvertebral
Bisphosphonates			
Alendronate	✔	✔	✔
Risedronate	✔	✔	✔
Etidronate	✔	-	-
Estrogen Replacement Therapy/HRT	✔	✔	✔
SERMs (Raloxifene)	✔	-	-
Calcitonin, intranasal	✔	-	-

Calcium with vitamin D preparations	-	✔	✔

*Evidence of antifracture efficacy of antiresorptive agents from randomized, placebo-controlled clinical trials of women with prior vertebral fractures or with osteoporosis. ✔ = Convincing evidence of antifracture efficacy; ± = Inconsistent results; - = ineffective, or insufficient evidence of efficacy.

- Consider NON-PHARMACOLOGIC interventions:
  - Advise smokers to quit
  - Check visual acuity
  - Reduce the risk of falls, if possible
  - Consider hip protectors in frail elderly patients to reduce the risk of hip fracture

VIII. Summary

Always investigate the possibility of osteoporosis in older patients with fracture due to minor trauma such as a fall from standing height to the floor

- Ensure that the patient receives optimal post-fracture care including evaluation and appropriate treatment for underlying osteoporosis. Either conduct the evaluation yourself or refer to a physician interested in osteoporosis
- The surgeon's responsibilities include the following:
  - **Inform the patient about the need for an osteoporosis evaluation.** The orthopedic surgeon should have a basic understanding about osteoporosis and its treatments.
  - **Investigate whether osteoporosis is an underlying cause of the fracture.** The evaluation should include a clinical history of risk factors and bone mineral density (BMD) assessment, as appropriate.
  - **Ensure that appropriate intervention is initiated**. The orthopedic surgeon should ensure that an osteoporosis evaluation is done and appropriate intervention taken. Evidence of the evaluation and treatment should be documented in the patient's record.

Reference:
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