

# Protect patients' bones when prescribing

**Principal Source:** Richards JB, Papaioannou A, Adachi JD, et al, and the Canadian Multicentre Osteoporosis Study Research Group. Effect of selective serotonin reuptake inhibitors on the risk of fracture. *Arch Intern Med.* 2007;167(2):188-194.

**Discussants:** Sarah K. Rivelli, MD, and Andrew J. Muzyk, PharmD

An increased risk of developing osteoporosis may be a hazard of some psychiatric medications and disorders. Osteoporosis is common among postmenopausal women, and additional risk factors for women and men include certain psychiatric disorders (anorexia nervosa and alcohol abuse) and medications such as lithium and some anticonvulsants. In addition:

- Tricyclic antidepressants and selective serotonin reuptake inhibitors (SSRIs) are associated with decreased bone mineral density and increased risk of hip fractures.<sup>1,2</sup>
- A population-based prospective cohort study found that community-dwelling adults age ≥50 who took SSRIs had double the risk of incident fragility fractures over 5 years,<sup>1</sup> although corticosteroid and anticonvulsant use was more common among those taking SSRIs compared with controls and may have contributed to the higher risk.

- Some studies have suggested that depression may be associated with bone loss.<sup>3</sup>

Osteoporosis is diagnosed by the presence of a low-impact fracture, a spontaneous fracture—also called fragility fracture—or by decreased bone mineral density testing measured by dual x-ray absorptiometry (DXA) of the lumbar spine and proximal femur.<sup>4</sup> Bone mineral density measured by DXA that is ≥2.5 standard

deviations below the young adult female reference mean—called a T-score ≤-2.5—is consistent with an osteoporosis diagnosis. Blood tests are not necessary for diagnosis but may detect abnormal calcium or



Robert M. McCarron, DO  
Series Editor

Table 1

## Osteoporosis risk factors\*

<b>Psychiatric disorders</b>	Anorexia nervosa Alcohol dependence
<b>Medications</b>	Anticonvulsants (valproic acid, phenytoin) Lithium Glucocorticoids
<b>Demographics and history</b>	Female gender Age >65 in women, >70 in men Caucasian or Asian race Low body weight (<127 lb) Personal history of fracture Fragility fracture in a first-degree relative Excessive alcohol, tobacco, or caffeine use Physical inactivity, immobility
<b>Chronic medical illnesses</b>	Celiac disease Chronic obstructive pulmonary disease Diabetes mellitus type 1 Gastric bypass surgery HIV/AIDS Hyperthyroidism Hypogonadism Inflammatory bowel disease Renal failure Rheumatoid arthritis Systemic lupus erythematosus

\*Emerging evidence points to depression and selective serotonin reuptake inhibitor use as potential risk factors

Dr. Rivelli is associate program director, internal medicine-psychiatry residency, departments of internal medicine and psychiatry, and Dr. Muzyk is a clinical pharmacist, Duke University Medical Center, Durham, NC.

**Table 2**

**Daily calcium and vitamin D requirements for adults by age**

Age	Elemental calcium (mg)	Vitamin D (IU)
19 to 50	1,000	200
51 to 70	1,200	400 (>800)*
>70	1,200	600 (>800)*

\*National Osteoporosis Foundation recommends >800 IU in adults age >50  
Source: Reference 6

phosphorus metabolism related to comorbid disorders.

The U.S. Preventive Services Task Force recommends osteoporosis screening for all women age ≥65 and women age <65 who have risk factors for fracture (Table 1, page 23).<sup>5</sup> There is no consensus on when to screen men, although all adults with a fragility fracture should undergo bone mineral density testing.

Consider screening men and women age >65 if secondary causes of osteoporosis—such as hypogonadism, hyperparathyroidism, hyperthyroidism, Cushing’s syndrome, inflammatory bowel disease, inflammatory arthritis, and hematologic cancers—are present.<sup>4</sup>

**Prevention.** A diet rich in calcium and vitamin D is essential for healthy bone growth.<sup>4</sup> Daily requirements increase with age and are highest among adults age >50 (Table 2).<sup>6</sup> Because the typical U.S. diet has poor calcium content, most adults and children will need calcium supplementation to meet daily requirements. Additional healthy bone lifestyle measures include avoiding caffeine and limiting alcohol consumption to <2 drinks/day.

Physical activity reduces the risk of falls and fractures by increasing muscle strength, coordination, and mobility. Weight-bearing exercise delays osteoporosis onset by promoting strong bone development. When possible, avoid prescribing medications that increase the risk of falls, such as sedative-hypnotics, benzodiazepines, and anticholinergics, or cause bone loss, such as phenytoin, glucocorticoids, and phenobarbital.

**Treatment.** First-line pharmacologic treatment of osteoporosis includes calcium plus vitamin D and a bisphosphonate.<sup>6</sup>

Calcium plus vitamin D increases calcium absorption and has been shown to significantly reduce fracture risk. Calcium typically is prescribed in a carbonate or citrate formulation.

- Calcium carbonate must be taken with meals because it requires an acidic environment for absorption.
- Calcium citrate may cause fewer gastrointestinal side effects, such as constipation.

Because one-time calcium absorption is limited to <600 mg, multiple daily dosing is required. The National Osteoporosis Foundation recommends >800 IU of vitamin D daily to reduce fracture risk in patients age >50 and in those with osteoporosis.<sup>7</sup>

**Bisphosphonates** have been shown to reduce fracture risk and increase bone mineral density, primarily in the spine and hip and sometimes within 6 months. Once-weekly alendronate and once-monthly risedronate and oral ibandronate are FDA-approved for prevention and treatment of osteoporosis in postmenopausal women. Quarterly ibandronate and once-yearly zoledronic acid injections are approved for osteoporosis treatment. Alendronate and risedronate also are approved to treat osteoporosis caused by glucocorticoid therapy and in men.

Although bisphosphonates do not cause adverse psychiatric effects or interactions with psychotropic medications, bisphosphonates must be taken at least 30 minutes before any other medications. Adverse effects from oral bisphosphonates often are gastrointestinal—such as nausea, heartburn, pain, irritation, and ulceration—and patients should take these medications with only a glass of water and remain upright for at least 30 minutes after ingestion.

**Other therapeutic options** include teriparatide—a synthetic form of parathyroid hormone injected daily—calcitonin, and raloxifene. Estrogen therapy increases bone density in postmenopausal women but is not recommended for routine use because of increased risk of stroke,

**Clinical Point**

Daily calcium and vitamin D requirements increase with age and are highest among adults age >50



Visit this article at [CurrentPsychiatry.com](http://CurrentPsychiatry.com) to learn about calcium and vitamin D values in supplements, foods, and beverages

thromboembolism, heart disease, and breast cancer.

#### Related Resources

- World Health Organization Fracture Risk Assessment tool. [www.shef.ac.uk/FRAX](http://www.shef.ac.uk/FRAX).
- National Osteoporosis Foundation. [www.nof.org](http://www.nof.org).

#### Drug Brand Names

Alendronate • Fosamax	Prednisone • Deltasone, Meticorten
Calcitonin • Miacalcin	Raloxifene • Evista
Ibandronate • Boniva	Risedronate • Actonel
Lithium • various	Teriparatide • Forteo
Phenobarbital • various	Valproic acid • Depakene
Phenytoin • Dilantin	Zoledronic acid • Reclast

#### Disclosure

The authors report no financial relationship with any company whose products are mentioned in this article or with manufacturers of competing products.

#### References

1. Richards JB, Papaioannou A, Adachi JD, et al, and the Canadian Multicentre Osteoporosis Study Research Group. Effect of selective serotonin reuptake inhibitors on the risk of fracture. *Arch Intern Med.* 2007;167(2):188-194.
2. Diem SJ, Blackwell TL, Stone KL, et al. Use of antidepressants and rates of hip bone loss in older women: the study of osteoporotic fractures. *Arch Intern Med.* 2007;167(12):1240-1245.
3. Eskandari F, Martinez PE, Torvik S, et al, and the Premenopausal, Osteoporosis Women, Alendronate, Depression (POWER) Study Group. Low bone mass in premenopausal women with depression. *Arch Intern Med.* 2007;167(21):2329-2323.
4. Raisz LG. Clinical practice. Screening for osteoporosis. *N Engl J Med.* 2005;353(2):164-171.
5. Nelson HD, Heffland M, Woolf SH, et al. Screening for postmenopausal osteoporosis: a review of the evidence for the US Preventative Services Task Force. *Ann Intern Med.* 2002;137:529-541.
6. Qaseem A, Snow V, Shekelle P, et al, and the Clinical Efficacy Subcommittee of the American College of Physicians. Pharmacologic treatment of low bone density or osteoporosis to prevent fractures: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* 2008;149(6):404-415.
7. National Osteoporosis Foundation. Clinician's guide to prevention and treatment of osteoporosis. Available at: [http://www.nof.org/professionals/Clinicians\\_Guide.htm](http://www.nof.org/professionals/Clinicians_Guide.htm). Accessed April 1, 2009.

#### Practice Points

- Anorexia and alcohol abuse are **risk factors for osteoporosis**; depression and antidepressant treatment also may increase risk.
- **Screen** postmenopausal women and any adult with a history of fragility fracture, secondary causes of osteoporosis, or use of medication associated with increased risk.
- **Encourage lifestyle measures** such as diet, weight-bearing physical activity, and smoking cessation, and recommend calcium and vitamin D supplements.
- **Refer women** age >65 and others at risk for bone mineral density testing and evaluation for bisphosphonate therapy.

**IN THE UNITED STATES,  
THE PRESS CANNOT BE CENSORED.**

**THE INTERNET CANNOT BE CENSORED.**

**POLITICAL ADVERTISING  
CANNOT BE CENSORED.**

**WHY ARE SOME MEMBERS OF  
CONGRESS & ACADEMIA TRYING TO  
CENSOR MEDICAL COMMUNICATIONS?**

Diabetes. Cancer. Obesity. Respiratory disease. America's medical professionals are busier than ever. How can they stay current with medical advances and still improve their patients' well-being?

Information is part of quality care. Yet government controls threaten to keep doctors in the dark about current medical advances.

Restrictions on how much information consumers and doctors can know about current and new treatments reduce their ability to advocate for care.

Using censorship as a policy tool to control healthcare costs is a bad idea! Yet that's what vocal pockets of academic medicine and Congress have in mind.

We are concerned that some members of Congress and academia are seeking to restrict the content of CME and other industry-sponsored communications without input from practicing physicians.

**Information is the first step to care.  
To learn more, visit [cohealthcom.org](http://cohealthcom.org).**

*This message brought to you as a public service by the  
Coalition for Healthcare Communication.*