

Bone Density Screening Belongs in Primary Care

Testing is recommended for all women aged 65 years and older and those at risk for osteoporosis.

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SAN FRANCISCO — Measuring bone mineral density in older patients is as justifiable as measuring lipids, Dennis M. Black, Ph.D., said at a meeting on osteoporosis sponsored by the University of California, San Francisco.

Lipid testing and treatment for high cholesterol is accepted as an integral part of primary care, but bone densitometry and treatment for low bone density isn't as readily accepted, said Dr. Black, professor of epidemiology and biostatistics at the university.

That's partly because measurements and treatments for osteoporosis came along well after tests and treatments for heart disease and its risk factors, he explained. The ready acceptance of lipid screening compared with bone density screening bothers

some osteoporosis experts. "It might be called lipid envy," Dr. Black joked.

By the numbers, the value of bone density testing stacks up nicely against the value of lipid testing. Studies have shown that people with cholesterol measurements in the highest quartile have four times the risk for heart disease compared with people whose cholesterol measurements are in the lowest quartile, he said. Stratifying hip bone density by quartile, the risk for hip fracture increases 10-fold in people whose bone density is the lowest quartile compared with those in the highest quartile.

Heart disease risk increases from about 0.5% in the lowest low-density lipoprotein (LDL) quartile to about 4% in the highest lipid quartile. Hip fracture risk increases from about 0.5% in the highest quartile of hip bone density to about 10% in the quartile with the least hip bone density.

Cost-effectiveness compares well, too, he added. Screening lipid levels in a 52-

year-old woman and treating her for an LDL level greater than 160 mg/dL costs about \$400,000 per quality-adjusted life-year. Screening bone density in a 65-year-old woman and treating her with bisphosphonates for a T-score of -2.5 (suggesting osteoporosis) costs about \$30,000 per quality-adjusted life-year, "which is considered cost-effective," Dr. Black said.

The National Osteoporosis Foundation recommends bone mineral density testing for all women aged 65 years and older, and for postmenopausal women with a risk factor for osteoporosis.

The definition of risk factors for osteoporosis is a bit murky. Dr. Black includes postmenopausal women who have a history of fracture after menopause, whose mothers have a history of fracture (especially hip fracture), who take steroids, or who have very low body weight. Very low body weight commonly is considered being below 125 pounds, but that depends somewhat on height, he added.

The U.S. Preventive Services Task Force recommends bone mineral density measurements for all women above age 60.

Medicare covers bone density tests for women over age 65.

Dr. Black recently analyzed 16 years of follow-up data on women in the Study of Osteoporotic Fractures and found that a single measurement of hip bone density is a good predictor of fracture risk. In these white women with a mean age of 71 years, 5% of those in the highest quartile of hip bone density developed a hip fracture over the 16-year period, compared with 32% of women in the lowest quartile of hip bone density.

The difference was "fairly dramatic" he said. Women with the lowest quartile of hip bone density on a single measurement at the start of the study had an immediate increase in risk for hip fracture that continued as far out as 16 years.

"If it's not possible to repeat bone density measurements in 2, 3, or 4 years, you know that the (one) value that you have is still going to be predictive long term," he said.

There is a growing recognition that T scores shouldn't be used for peripheral measurements, Dr. Black added. ■

Explain T and z Scores to Patients After Measuring Their Bone Density

SAN FRANCISCO — Patients receiving bone densitometry should be counseled about their T and the z scores, Steven T. Harris, M.D., advised at a meeting on osteoporosis sponsored by the University of California, San Francisco.

The T score compares the patient's bone mineral density with the mean peak bone density of a 30-year-old person of the same sex and is expressed as a number of standard deviations above or below the young person's density, said Dr. Harris of the university.

The z score compares the patient's bone mineral density with mean peak density for someone the same age, and helps give patients some perspective. "In my consultative practice over the years,

I've seen many, many, many patients who have been terrified by being told that they have osteoporosis at age 78 by comparing them to that 30-year-old, and yet who feel reassured when you show them where they are relative to their peers," he said.

Sharing both score types helps give patients a more accurate picture of their bone health. A 55-year-old woman with a z score of -2 has bone density around the lower limits of normal for her age, but her T score would be -3.2 , compared with a young adult. That patient can be reassured that she's similar to her

peers, but should be persuaded that "there is an issue here that needs to be addressed," he said.

That said, the patient with a T score above -2.5 (the cutoff for osteoporosis) can still have a clinical diagnosis of osteoporosis if other factors are present such as atraumatic vertebral fractures.

Getting a z score can be especially motivating because those patients who are abnormal, compared with their peers, need the



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DR. HARRIS

greatest attention to possible secondary causes of low bone density. "If you see an abnormal z score, it makes you worry that much more about something very unusual going on in that particular patient," Dr. Harris said.

Patients should also be warned that first bone density measurements give a snapshot of the skeleton's current state. But a low T score does not identify the cause of the low bone density, and the patient should not be labeled osteoporotic automatically, he added. Density reports can have a fairly wide margin of error on first-time measurements.

In addition, bone density measurements often vary by a few percentage points when done by different machines. Whenever possible, follow-up scans should be performed with the same machine, he advised.

Vitamin D deficiency leading to reduced osteomalacia can produce a low T score that can improve dramatically once the vitamin deficiency is corrected. Celiac disease with malabsorption can lead to a low T score.

Individual T scores for L1-L4 on spinal densitometry are usually aggregated for diagnostic purposes instead of using the individual results for vertebral bodies. The best and worst scores for individual vertebrae should be within one standard deviation of each other. If not, one should suspect an imaging artifact. In these cases, usually the "best" T score is spurious, Dr. Harris said.

It's important to not just read the densitometry report but to look at the scan, he added.

Whiteness seen on the L3 and L4 sections of a spinal scan may be due to facet joint sclerosis, skewing density readings. The aggregation of L1-L4 measurements in one such patient produced a T score of -1.7 , suggestive of osteopenia.

Excluding the L3-L4 measurements, however, the T score was -2.9 , in the range of osteoporosis, he said. ■

United States Not Yet Ready For Gender-Blind T Scores

SAN FRANCISCO — A trend toward using one set of parameters to diagnose osteoporosis in both men and women hasn't caught on in the United States, where sex-specific bone density scores are the norm, Eric S. Orwoll, M.D., said at a meeting on osteoporosis sponsored by the University of California, San Francisco.

Yet despite the ease of a gender-blind system and some persuasive data, using a sex-specific method is the way to go, at least until more data accumulate on bone loss and fracture risk in men, suggested Dr. Orwoll, professor of medicine at Oregon Health and Science University, Portland.

The evidence supporting the use of one set of parameters is mounting. Studies in recent years have shown, for example, that the 1-year risk for hip fracture overlaps in men and women with the same hip bone mineral densities. As the density gets lower, the risk for fracture increases at essentially the same rate in both sexes.

Such findings have led some bone experts to suggest that it would be easier and logical for clinicians to use just one reference range for diagnosing osteoporosis instead of using separate T scores for men and women. Bone densitometry machines in the United States currently calculate a sex-specific T score.

The International Osteoporo-

sis Foundation in 2000 noted that the same absolute values of bone density in men and women yield the same absolute risk of vertebral or hip fracture, suggesting that using one threshold for calculating risk makes sense. The data on men are scanty, according to the statement.

Those who favor using one set of parameters usually propose using T scores that report the number of standard deviations between current bone density and the mean peak density of a 30-year-old female.

But the problem with using such a strategy, Dr. Orwoll said, is that only about 3% of older men would be identified as osteoporotic, in comparison with a young female reference population, while 19% of older men would be deemed osteoporotic if their T scores came from reference to young male norms.

About 25%-30% of older men will have a fragility fracture, but if the female reference range were used, only a small percentage of them would be identified as osteoporotic. "So there's a little bit of incongruity in the application of the International Osteoporosis Foundation recommendations, despite the fact that they're scientifically reasonable," Dr. Orwoll said.

He encouraged clinicians to keep using the sex-specific T scores from densitometry machines until better data on fracture risk in men are available. ■