

# Weight, Sport Predict Varsity Women's BMD

BY DAMIAN McNAMARA  
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MIAMI — Weight and type of sport played by Division I varsity female athletes were significant predictors of bone mineral density measurements, according to a study presented at the annual meeting of the American Medical Society for Sports Medicine.

Dr. Willa Fornetti performed a cross-sectional analysis of 103 female athletes in gymnastics, softball, running, track, field hockey, rowing, swimming/diving, and volleyball at Michigan State University.

"BMI was markedly similar among groups—not what we anticipated. The runners were slightly lower than others, though," said Dr. Fornetti, of Michigan State University, East Lansing.

As might be expected, gymnasts had the lowest mean height, and volleyball players had the highest. Runners and gymnasts had the lowest weights and fat-free mass, as well as the highest percentage of menstrual dysfunction.

Dr. Fornetti used dual-energy x-ray absorptiometry to measure total body, lumbar spine, pelvic, and average right/left leg BMD. She compared BMD measurements between athletes involved in sports by using analyses of covariance. She also determined significant predictors of BMD for each site through a stepwise regression analysis.

The 6 athletes with amenorrhea and 18 with oligomenorrhea had statistically significant lower bone mineral density than did other participants, Dr. Fornetti said.

The World Health Organization defines osteopenia as a bone density between 1 and 2.5 standard deviations below the bone density of a normal young adult.

"The good news is that none of our athletes met WHO criteria for osteopenia, regardless of menstrual function," Dr. Fornetti said.

**Because lower body weight was associated with lower bone mineral density, it can be used to screen runners, swimmers, and divers for their osteopenia risk.**

Runners, swimmers, and divers had significantly lower BMD than the other athletes. Runners also had the lowest mean lumbar spine BMD. Pelvic BMD was lower for runners, swimmers, and divers, Dr. Fornetti said. "Runners had significantly lower BMD at every site, except average leg score,

versus athletes in field hockey, softball, and volleyball."

Limitations of the study include its lack of data on nutrition and eating disorders, and history of training or injury. A large number of participants, multiple-site BMD measurements, and an ability to compare different types of sports are among its strengths, Dr. Fornetti said.

Because lower body weight was associated with lower BMD, "it can be used to screen runners, swimmers and divers," Dr. Fornetti said. She added that clinicians should consider weight and type of sport played by a female varsity athlete when evaluating bone health. ■

# WHO Osteoporosis Guidelines Tailor Treatment to Resources

BY ROBERT FINN  
San Francisco Bureau

SAN FRANCISCO — Evidence-based osteoporosis guidelines now being developed by the World Health Organization will evaluate treatment cost-effectiveness and help individual nations tailor management of the disease based on their resources, Dr. Douglas C. Bauer said at a meeting on osteoporosis sponsored by the University of California, San Francisco.

Several speakers at the UCSF conference said that they expect these guidelines to appear later in 2006 or sometime in 2007. Dr. Bauer, of UCSF, said he hopes that the WHO guidelines can be adapted for use on a personal digital assistant or a Web-based program. The clinician would plug in the patient's bone mineral density (BMD) and other risk factors, and the software would calculate the patient's probability of suffering a fracture within the next 10 years.

Until the WHO guidelines are finished, however, "clinicians are sort of left out dangling by themselves" with currently available guidelines, which contain many gaps, said Dr. Bauer. "There are absolutely no good evidence-based guidelines for nonpostmenopausal women populations," or for men and ethnic minorities. "There are no good evidence-based guidelines to help you decide how long you should treat people."

The five available guidelines are:

► **The 1994 WHO guidelines.** These were highly influential because they defined osteoporosis and osteopenia based on T-scores, resulting in the widespread use of densitometry. "This was never meant to be a treatment guideline or to identify treatment thresholds, although in the medical community they were largely identified as such," Dr. Bauer said.

► **The American Association of Clinical Endocrinologists (AACE) guidelines.** Although AACE conducted a review of the literature, the AACE guidelines ultimately were based on a consensus of experts rather than a quantitative, evidence-based review (Endocr. Pract. 2003;9:544-64), Dr. Bauer noted.

These guidelines state that women with postmenopausal osteoporosis should be treated if they've experienced a fracture and have a low BMD, or if their T-score is less than -2.5. Women with osteopenia should also be treated if they have risk factors, and the list of risk factors is longer than in the National Osteoporosis Foundation (NOF) guidelines. Patients should also be treated if nonpharmacologic therapy—vitamin D and calcium supplementation—proves ineffective as evidenced by bone loss or fracture.

► **U.S. Preventive Services Task Force guidelines.** These guidelines, published in 2002, addressed only screening for

osteoporosis, not treatment, Dr. Bauer said.

► **Canadian Task Force on Preventive Health Care guidelines.** Issued in 2004 (CMAJ 2004;170:1665-7), these guidelines were developed using a rigorous evidence-based approach and state that patients who are classified as normal under WHO guidelines should receive no treatment. Those classified as having WHO osteopenia should be considered for a bisphosphonate or raloxifene if they are older than 65 years and have a T-score below -2.0. Patients classified as having WHO osteoporosis should be treated with a bisphosphonate and raloxifene, and parathyroid hormone should also be considered.

► **National Osteoporosis Foundation guidelines.** Dr. Bauer reserved his greatest praise for these guidelines, first published in 1999, revised in 2003, and available through the foundation's Web site (www.nof.org).

Centered on an unbiased, evidence-based review of the literature, the NOF guidelines state that patients should be treated if their T-scores are less than -2.0 without any additional risk factors or less than -1.5 in the presence of certain risk factors. Treatment was also indicated even in the absence of a BMD score for patients with previous vertebral or hip fractures.

A drawback is that the NOF guidelines don't apply to ethnic minorities, premenopausal women, or men. ■

# Continue Osteoporosis Therapy Even in Nonresponders

BY ROBERT FINN  
San Francisco Bureau

SAN FRANCISCO — Antiresorptive therapy should be continued even in patients showing no apparent response, Dr. Douglas C. Bauer said at a meeting on osteoporosis sponsored by the University of California, San Francisco.

Monitoring response with periodic bone mineral density (BMD) testing may be misleading, said Dr. Bauer, of UCSF. Furthermore, studies show that antiresorptive therapy decreases fracture risk even when BMD declines. And a patient whose BMD declines in the first year of therapy will often see an improvement in subsequent years.

Those advocating periodic monitoring cite several potential advantages of the practice, including increases in patient satisfaction, improvements in adherence, and the ability to change to more effective

therapy in the presence of a nonresponse.

But Dr. Bauer pointed out that there are no studies demonstrating that monitoring improves patient satisfaction or adherence. While it's true that many patients stop taking drugs to prevent osteoporosis, more than half of those who discontinue do so within 6 months of beginning therapy, he said. Measuring BMD 1-2 years following diagnosis is therefore unlikely to encourage adherence in the majority of patients.

In addition, changes in BMD on subsequent measurements may be misleading. Although BMD is usually considered a very precise measurement, with precision errors in the neighborhood of 1%-2%, some apparent changes in BMD may be due to noise or to small differences in patient position, Dr. Bauer said.

To figure out what changes in BMD measurements are due to chance, Dr. Bauer recommended using the "least significant

change" formula. The least significant change in any measurement is defined as three times the measurement's long-term reproducibility. For example, if a dual-energy x-ray absorptiometry (DXA) instrument has a long-term coefficient of variation of 1.5%, its least significant change would be 4.5%, meaning that changes of less than 4.5% from measurement to measurement may well be due to chance.

But even if a patient's BMD truly is declining, that does not necessarily mean that the patient is failing to respond to treatment, since he or she may well have lost more bone without treatment, he added.

And an initial loss of bone during treatment doesn't mean that this loss will continue. Dr. Bauer quoted one study that showed that of patients who lost more than 4% of their BMD during the first year of treatment, 92% gained BMD in the second year, and the average increase during

the second year was 4.8%. On the other hand, of patients who gained more than 8% in BMD during the first year, only 36% continue to gain BMD in the second year, and as a whole that group lost 1% of their BMD during that second-year.

An analysis of a clinical trial of alendronate versus placebo compared the patients who lost most BMD while taking alendronate with those who lost most BMD while taking placebo. Fracture risk was reduced by about 50% in those taking alendronate despite their loss of BMD.

Clinicians should consider secondary causes of osteoporosis in patients who are losing BMD despite antiresorptive therapy, Dr. Bauer said. Among the common secondary causes of bone loss are weight loss; medications such as corticosteroids, aromatase inhibitors, and glitazones; inflammatory diseases or myeloma; or malabsorption. ■