DXA after menopause

To the Editor: I want to commend Drs. Tough DeSapri and Brook for their excellent summary on the use of the FRAX tool in assessing the need for dual-energy x-ray absorptiometry (DXA) in postmenopausal women.[1]

A thought experiment that we engage in with our fellows is to take the FRAX tool and calculate the changes in 10-year fracture risk obtained by changing each of the parameters. For example, the patient discussed in the article would have a 10-year risk of a hip fracture of 0.4%. However, if we add 16 years to her age (making her 72 years old), her level of risk is 3.0%, which would justify the use of a medical intervention such as a bisphosphonate. Similarly, her risk increases to 1.3% if she had suffered a previous fracture, and to 0.8% if she had taken a signifi cant amount of glucocorticoids.

Many of us compensate for the lack of quantitation in the FRAX questionnaire by using "fudge factors." For glucocorticoids, we increase the fracture risk by 15% if a patient was on more than 7.5 mg of prednisone for 3 or more months.[2]

One glaring defi ciency in the FRAX score is an absence of any reference to diabetes. Type 2 diabetes mellitus is associated with a signifi cant risk of fracture without a signifi cant decrease in bone density.[3] Suggested compensations include adding 10 years to the patient's age or checking "yes" for rheumatoid arthritis when calculating FRAX for a patient with type 2 diabetes mellitus.

The trabecular bone score mentioned by DeSapri and Brook is a way of getting at the issue of bone quality and at least partially corrects the calculation of fracture risk for the diabetic patient. Data entry for the trabecular bone score is now built into the online FRAX tool and can be added after clicking "Calculate." Race also is now available for the US FRAX tool.

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In Reply: Thank you for your commentary on "off-label" use of FRAX to better predict fracture risk for patients (such as those with diabetes or on high-risk medications) who

don't fit neatly into the FRAX algorithm. FRAX does allow for individualized calculation of relative risk of fracture across age and hip bone mineral density. And age may indirectly incorporate risk of falls, as 25% of people over age 65 fall annually.[1]

With the limitations of FRAX, we must recognize that calculation tools must not replace clinical judgment and assessment of fall and fracture risk for our individual patients. Bone mineral density scanning estimates 70% of bone strength, and other factors may influence fracture risk. As Dr. Balkin mentions, the trabecular bone score and also hip geometry (bone strength based on the measurement of proximal femur) may supplement axial bone mineral density testing with central DXA to determine propensity to fracture.[2]

Other technologies are being developed. For example, biomechanical computed tomography uses finite element analysis to provide a virtual stress test of a patient's bone to measure its breaking strength in newtons.

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