Does DXA have a role in clinical decision making?

E. Michael Lewiecki

New Mexico Clinical Research & Osteoporosis Center, Albuquerque, NM, USA

Dual-energy X-ray absorptiometry (DXA) plays an important role in the management of osteoporosis and other skeletal disorders. Listed below are measurements by DXA and their clinical applications.

Bone Mineral Density (BMD). The diagnosis of osteoporosis can be made with measurement of BMD expressed as T-score according to well-established criteria. The lower the T-score the greater the risk of fracture. T-score values are a component of many clinical practice guidelines for selecting patients for pharmacologic therapy to reduce fracture risk. Femoral neck BMD is an important input for the fracture risk assessment tool (FRAX), where the 10-year fracture probability calculation is more robust with inclusion of BMD + clinical risk factors than with BMD or clinical risk factors alone. Quantitative change in BMD is used to monitor treatment effect, where stability or an increase in BMD is generally considered to represent a response to therapy. However, response to therapy does not necessarily mean that an acceptable level of fracture risk has been achieved. For this reason, the concept of treat-to-target for osteoporosis has been developed, with a T-score target > -2.5 (or better yet, > -2.0) for patients who are started on treatment because of T-score -2.5 or below.

Vertebral Fracture Assessment (VFA). Previously unrecognized vertebral fractures identified by VFA may result in a change of diagnostic classification, a change in fracture risk assessment, and a change in treatment decisions.

Trabecular Bone Score (TBS). This provides an assessment of bone quality related to trabecular structure in the lumbar spine. TBS is an independent predictor of fracture risk and can be included in FRAX calculations.

Hip geometry. Hip access length (HAL) is associated with hip fracture risk in postmenopausal women and may be a consideration in making treatment decisions.

Body composition. DXA is widely considered to be a highly effective technology for measurement of body composition that can be used in the assessment of nutritional disorders.

Femur imaging for incomplete atypical femur fractures (iAFF). Full length femur imaging by DXA is a convenient point-of-service method for early detection of iAFF.
Challenges and opportunities. In many parts of the world there is limited access to DXA, and where it is available it may not be affordable for some patients who could benefit. DXA reimbursement has declined to level below the cost of providing the service in some countries. Quality of DXA is often poor. Strategies to address quality issues include ISCD courses, meetings, publications, certification, and accreditation. Bone Health TeleECHO uses videoconferencing to expand capacity to deliver best practice skeletal health care, including high quality bone density testing by DXA.