

Dual-Energy X-Ray Absorptiometry: An Overview

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EDITORIAL

Dual-energy X-ray absorptiometry (DXA, formerly DEXA) is a spectrum imaging method for determining bone mineral density (BMD). Two X-ray beams are focused at the patient's bones, each with a distinct energy level. The bone mineral density (BMD) can be calculated from the absorption of each beam by bone after soft tissue absorption is eliminated.

In contrast to the DXA scan, which is sensitive to certain metabolic illnesses of bones in which bones are attempting to mend from infections, fractures, or tumours, the nuclear bone scan is primarily used to diagnose and follow osteoporosis. When it comes to X-rays, soft tissue and bone have distinct attenuation coefficients. A single X-ray beam going through the body will be affected by both soft tissue and bone, and it is impossible to tell how much of the attenuation is due to the bone from a single beam. The attenuation coefficients, on the other hand, fluctuate with the energy of the X-rays, as does the ratio of the attenuation coefficients. DXA employs two X-ray energies.

By using appropriate weighting, the difference in total absorption

between the two can be utilized to eliminate the absorption by soft tissue, leaving only the absorption by bone, which is proportional to bone density. Women over 65 should get a DXA scan, according to the US Preventive Services Task Force. The exact age at which men should be examined is unknown, but some sources suggest 70 years old.

When a woman's risk equals that of a healthy 65-year-old woman, she should consider getting a scan. Patients are frequently assigned a T score or a Z score for their bone density. A T score compares the patient's bone mineral density to that of a young adult of the same gender who has reached peak bone mineral density. A normal T score is -1.0 or greater, poor bone density is -1.0 to -2.5, and osteoporosis is -2.5 or above. A Z score is simply a comparison of a patient's bone mineral density to the average bone mineral density of men and women of their age and weight. With a few major restrictions, DXA scans can also be used to estimate overall body composition and fat content with a high degree of accuracy comparable to hydrostatic weighing. A low-resolution "fat shadow" image can also be obtained from DXA scans, giving a general idea of fat distribution across the body.

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