

Multisite bone ultrasound measurement on a North American Female Reference Population

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Cost, accessibility and other issues dictate that alternative techniques to DXA are increasingly being utilized in the assessment of fracture risk. Quantitative ultrasound (QUS) at the calcaneus has been validated as a predictor of fracture but measurement at a single site is likely to underestimate the extent of skeletal involvement in osteoporosis. The Sunlight Omnisense is a portable, inexpensive, QUS device that measures speed of sound (SOS) at multiple skeletal sites and therefore has the potential to provide a more complete assessment of an individual's overall fracture risk. In order to provide a robust normative female database, 545 healthy Caucasian women aged 20-90 were recruited at 5 centers across North America. SOS measurements were obtained from the distal 1/3 radius, proximal 3rd phalanx, mid-shaft tibia and 5th metatarsal. The results demonstrate that peak SOS occurs around the age of 40, with maximum mean values of 4161, 3928, 3786 and 4092 m/s seen at the radius, tibia, metatarsal and phalanx respectively. Maximal rate of decline of SOS was seen in the decade following the menopause (-12.4, -9.2, -12.1 and -18.8 m/s at radius, tibia, metatarsal and phalanx respectively). Reproducibility between successive measurements indicates high precision, with standardized coefficients of variance ranging between 1.5 and 4.5%. Greatest precision was seen at the metatarsal. Further work is required to clarify the biological significance of multi-site SOS measurements and their use in the assessment of fracture risk.

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