

Multisite Bone Ultrasound Measurement on a North American Female Reference Population

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This study describes the method of data collection for the North American Female Reference Database of the Omnisense device.

Study Design

This study measured the speed of sound (SOS) at four skeletal sites with the Sunlight Omnisense™ 7000S. For the study, 545 healthy Caucasian women aged 20-90 were recruited from five centers across North America. Data was collected and analyzed to establish the Omnisense reference curve and peak speed of sound (SOS) for each site.

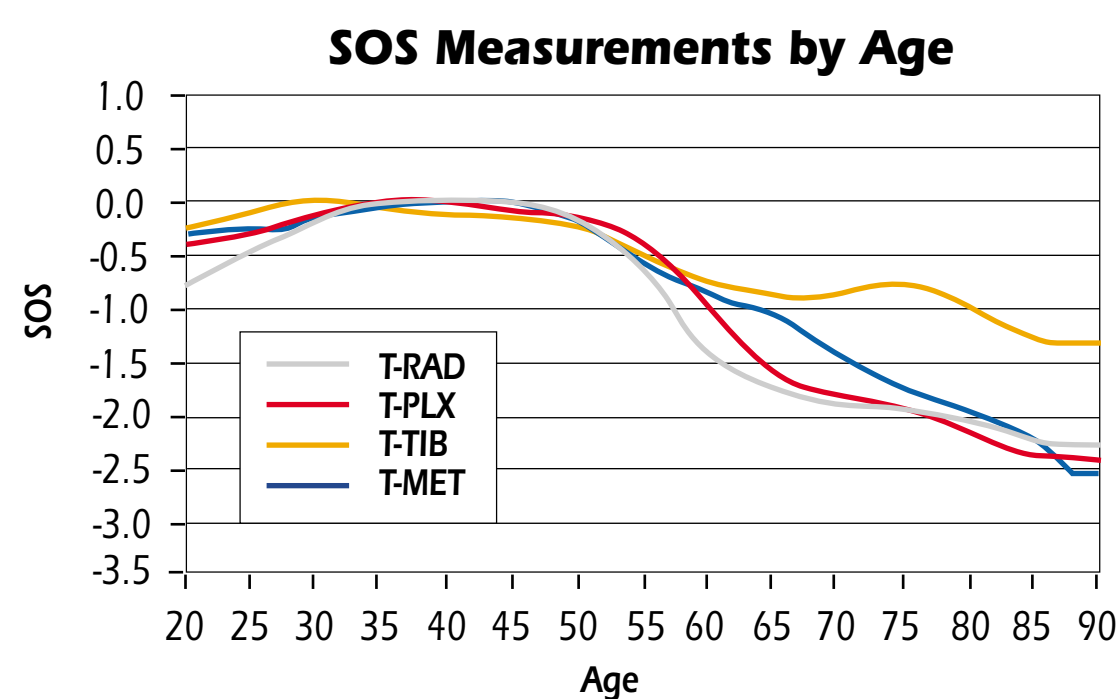
Subjects

Subjects for the study were required to meet the following criteria:

- No history of osteoporotic fracture or any condition affecting bone metabolism.
- No exposure for more than a year within the preceding three years to a medication affecting bone.

Results

Results demonstrated that peak SOS occurs around the age of 40. The maximal rate of decline of SOS was seen in the decade following menopause at the radius, tibia, metatarsal, and phalanx respectively. Reproducibility between successive measurements indicates high precision.



The graph depicts SOS results as a function of age for the Caucasian female distal 1/3 radius. Note that the SOS increases to a peak of 4158 m/sec at the age of 41 and declines thereafter. The overall change, from the maximal SOS value at the age of 45 to the minimal SOS at the age of 85, is -3.0 in T-score units. This is among the greatest changes observed by systems designed for bone assessment.

When comparing Omnisense SOS to bone density assessment devices such as DXA, it is noted that SOS measurements peak at a later age. This demonstrates that Omnisense SOS measurements reflect additional bone properties, including elasticity, cortical thickness, and micro-architecture.

Conclusion ►► Sunlight Omnisense™ bone measurements clearly established the age-dependent pattern of bone loss for adult North American Caucasian females. Omnisense-measured prevalence of osteoporosis in the female population between the ages of 60-90 is about 35% - the same as vertebral DXA. Based on this prevalence, Omnisense measurements meet WHO criteria for osteoporosis.