

## Multiple Site Ultrasound Measurements Predict Vertebral Fractures In Postmenopausal Women.

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Vertebral fractures are a common feature of osteoporosis and are associated with an increased risk of future fracture. The aim of this cross-sectional study was to determine the ability of multiple site speed of sound (SOS) measurements to differentiate between women with vertebral fractures and controls. A group of postmenopausal women with known osteoporotic vertebral fractures were recruited and measured at the distal radius and medial tibia using the Sunlight Omnisense™ (Rehovot, Israel) and at the lumbar spine and proximal femur using the Hologic QDR-4500 (Bedford, MA). The group consisted of 60 postmenopausal women with a mean age of  $73 \pm 7.3$ , 91.7% of whom had received treatment for osteoporosis. A control group of 91 normal postmenopausal women (mean age  $58 \pm 6.9$ ) with no history of low trauma fractures were also recruited and scanned at the same sites as above. Z-scores were calculated using the normal postmenopausal control group and the age adjusted odds ratios (OR) for each measurement site calculated using these. The groups used in the analysis are of differing sizes, as ultrasound measurements of both skeletal sites were not completed on all women.

Results	n(cases)	Z-score(cases)	OR	95% CI	p value
SOS Radius	60	-1.1	1.9	1.0-3.3	0.039
SOS Tibia	56	-0.5	1.1	0.6-1.7	0.807
BMD L1-L4	60	-1.1	2.2	1.2-3.8	0.009
BMD NOF	60	-1.5	3.2	1.7-5.9	<0.001

These results suggest that SOS measurements at the radius can discriminate vertebral fracture patients from controls, with a Z-score difference the same as that for lumbar spine BMD in the same group of subjects. However, the tibia measurement in the same group was not found to be significant, which is in agreement with previous studies. The results suggest that SOS measurements in the radius may have a useful diagnostic role despite that fact that they are measuring cortical bone at a site far from the clinical fracture.

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