



## President's Poster Abstract

PP-MON-30

### The use of MRI and freely accessible software in the calculation of apparent trabecular bone volume

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Microarchitectural parameters of bone can be quantified using 3D modalities such as QCT and MRI. There are many techniques, most using specific software and hardware that is currently unavailable outside of the centres in which these methods are being developed. Thus, the aim of this study was to quantify an apparent trabecular bone volume (appBV/TV) *in vivo* using MRI and freely available medical image viewing software.

Calcaneum scans were performed on male subjects enrolled in the Geelong Osteoporosis Study according to previously published methodology<sup>1</sup>. Identification of the most central scan in the sequence was performed and, using OsiriX 2, a circular region of interest (ROI) (2cm<sup>2</sup>) was placed 2cm anteriorly from the posterior tuberosity and propagated throughout the scan sequences, giving uniformity of ROI placement in areas devoid of cortical bone.

OsiriX histogram function was used to plot signal intensities for each ROI. Using developed histogram based threshold binarisation techniques, the histogram was separated into bone and marrow phases, allowing the calculation of an apparent trabecular bone volume expressed as percentage of total ROI volume. CV for appBV/TV determined from 5 separate scan sequences in the same subject after repositioning was 4%. CV determined from the same scan sequence in one individual analysed 5 times was 1%.

With acceptable CV, appBV/TV calculated using MRI and freely accessible software may prove to be a complementary diagnostic tool to DXA.

<sup>1</sup>Boutry *et al.* (2003) *Radiology* 227:708-17