

# Early Postmenopausal Bone Loss in Hyperthyroidism

## Evaluation by Dual X-rays Absorptiometry, Quantitative Ultrasound and Bone Marker Levels

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Omnisense demonstrates its value in detecting secondary osteoporosis in patients suffering from hyperthyroidism.

### Introduction

Thyroid hormones are essential for bone development in utero, growth in childhood, and steady-state turnover in adult life. The thyroid hormone effect on bone remodeling is evident in both trabecular and cortical bone, although it is more pronounced in cortical bone. Bone turnover state may be evaluated by measuring bone marker levels. While bone status is clinically evaluated by determining bone mineral density (BMD), most commonly by dual X-ray absorptiometry (DXA), it has recently been evaluated using quantitative ultrasound (QUS) as well.

### Study Design

The effect of thyroid metabolic status on bone in postmenopausal women was evaluated in this study by three different modalities. Bone mineral density was assessed using DXA, speed of sound (SOS) was assessed at multi-skeletal sites using the Sunlight Omnisense™, and blood was assessed by measuring bone marker levels.

Three different groups were recruited for the study:

HYPER - 59 hyperthyroid women with high levels of thyroid hormones

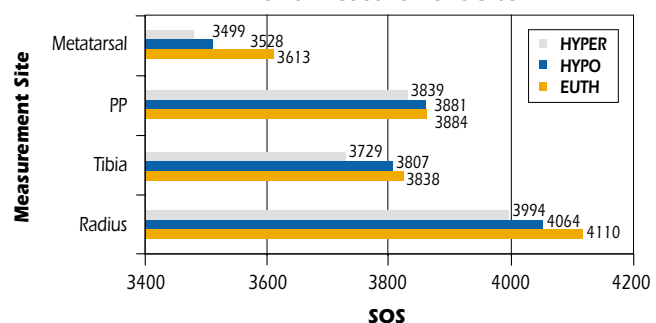
HYPO - 40 hypothyroid women with low levels of thyroid hormones

EUTH - 51 euthyroid women with enlarged thyroid gland but no metabolic effect

### Results

- SOS results expressed in Z-scores were lower in the HYPER group than in the EUTH group at the early menopausal period at all four measurement sites.
- A higher percentage of the HYPER group as compared to the EUTH group were found to be osteoporotic.
- Omnisense detected a greater difference between the bones of the EUTH group and the bones of the HYPER group than DXA did.

**SOS Measurements by Thyroid Condition and Measurement Site**



**Conclusion** ►► In-vivo evidence confirms that hyperthyroidism affects cortical bone more than trabecular bone. SOS measured by Omnisense, with its unique ability to measure cortical bone, is highly sensitive to the effects of hyperthyroidism.