



## Progress in Longevity Medicine Seminar Series

# Hyponatremia-Induced Osteoporosis

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*Professor of Medicine and Physiology*

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**Date/Time:** Friday, April 11, 2008; 5:30 pm (dinner included)

**Location:** The Arizona Club, 201 North Central Avenue, 37th Floor

**Cost:** Free

**Abstract:** Hyponatremia is the most frequently encountered metabolic disorder seen in clinical practice, with a particularly high incidence in the elderly. Using a rat model of chronic hyponatremia, we found severe trabecular and cortical bone loss at the spine, femur and tibia. Hyponatremic rats manifested markedly increased numbers of osteoclasts, indicating increased bone resorption as the primary cause of the bone loss. Analysis of human data from adults in NHANES III showed that mild hyponatremia is associated with increased odds of osteoporosis (T-scores < -2.5) at the hip (odds ratio = 2.85; 95% CI 1.03-7.86,  $p < 0.01$ ). Studies on RAW264.7 cells supported the *in vivo* findings, and showed that low extracellular sodium concentrations increase osteoclastogenesis and resorptive activity. Based on these and other studies, we hypothesize that hyponatremia-induced bone resorption results from an attempt of the body to preserve sodium homeostasis, and represents a significant, previously unrecognized risk factor for osteoporosis.

### Objectives:

- To understand the clinical significance of hyponatremia in the elderly population.
- To describe the effects of experimental hyponatremia on bone metabolism.
- To explore the potential mechanisms responsible for hyponatremia-induced bone loss and osteoporosis.

**Biography:** Joseph G. Verbalis, MD is Professor of Medicine and Physiology and Interim Chair of the Department of Medicine at Georgetown University Medical Center in Washington, DC. He is also Program Director of the General Clinical Research Center, and the Clinical Director of the Center for the Study of Sex Differences in Health, Aging and Disease.

He has also served as the Chief of the Division of Endocrinology and Metabolism at Georgetown University, and was a faculty member at the University of Pittsburgh, where he rose to the position of tenured Professor of Medicine.

Dr. Verbalis has published more than 250 journal articles and book chapters and is a regularly invited speaker at national and international meetings. He is also one of a small group of American physician scientists to have been honored with the Berthold Medal by the German Endocrine Society.

Dr. Verbalis' research has been continuously funded by the National Institutes of Health. His research interests include mechanisms underlying renal escape from vasopressin, osmotic regulation of hypothalamic gene expression and sex differences in physiology and pathophysiology.

Dr. Verbalis graduated from Princeton University with an A.B. in Chemistry, and received an M.D. from the University of Pittsburgh. He completed his residency training at the Hospital of the University of Pennsylvania and his fellowship training in endocrinology and metabolism at the University of Pittsburgh.

To RSVP or for additional information, please contact Stephanie Tusalem at (602) 778-7492 or via email at [stephanie.tusalem@kronosinstitute.org](mailto:stephanie.tusalem@kronosinstitute.org).

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