

## EXPOSURE TO LEAD AND COGNITIVE FUNCTION IN OLDER WOMEN

**Melinda C. Power**, *Department of Epidemiology, Harvard School of Public Health, USA and Department of Environmental Health, Harvard School of Public Health, USA*

**Jennifer Weuve**, *Department of Environmental Health, Harvard School of Public Health, USA and Rush Institute for Healthy Aging, Rush University Medical Center, USA*

**Linda H. Nie**, *Purdue University, School of Health Sciences, College of Health and Human Sciences, USA*

**Fran Grodstein**, *Department of Epidemiology, Harvard School of Public Health, USA, and Channing Laboratory, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, USA*

**Susan Korrick**, *Department of Environmental Health, Harvard School of Public Health, USA and Channing Laboratory, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, USA*

**Marc G. Weisskopf**, *Department of Epidemiology, Harvard School of Public Health, USA and Department of Environmental Health, Harvard School of Public Health, USA*

**Background and Aims:** Previous research suggests that chronic low-level lead exposure is associated with impaired cognition, but little research has considered this association in women. We examined this association in expanded repeated outcome assessment data in a subset of participants in the Nurses' Health Study.

**Methods:** We measured lead concentrations in blood, indicating recent exposure, and patella and tibia bone, indicating chronic exposure. Women completed up to four cognitive assessments. Cognitive test scores were z-transformed. We used linear mixed models to evaluate the test-specific and global association between cognition and each lead biomarker.

**Results:** 584 women who were, on average, 61 (SD: 6) years old at lead measurements (mean (SD) in blood: 2.9 (1.9) µg/dL, patella: 12.6 (11.7) µg/g bone, tibia: 10.5 (9.7) µg/g bone) completed at least one cognitive assessment (average: 2.1 assessments, 3.0 years apart). In our global analysis, for each SD increase in tibia bone lead concentration, we observed a 0.044 SD lower cognitive test score (95% CI: -0.088, 0.001), an effect similar to a difference of 3 years of age. Associations were weaker for patella and blood lead concentrations. Previous work with more limited data suggested a positive association between lead exposure and performance on the letter fluency task; this suggestion did not persist in the expanded data. Preliminary evaluation of the association between lead and change in cognitive function did not suggest an association.

**Conclusions:** In expanded data, we confirmed previous findings that lead is related to level of cognitive function in women. Our analysis suggests the previous finding that higher lead was associated with better performance on the letter fluency task was spurious. Although we did not see an association between lead and change in cognitive function, these preliminary analyses are limited by short duration of follow-up, learning effects, and our participants' good health.