

## Biomarkers (non-neuroimaging) / novel biomarkers

## Sleep duration and its association with cognition vary with rurality in older veterans

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**Abstract**

**Background:** Sleep duration is associated with cognitive health in older individuals and is increasingly recognized as an important modifiable factor related to dementia risk. Sleep and its relationship with cognitive function is understudied in rural U.S. Veterans, who are under-represented in clinical research aging studies.

**Method:** Participants (age  $\geq 57$ ) were enrolled as part of Collaborative Aging Research using Technology (CART), a multi-site study examining the feasibility of unobtrusive remote sensing and monitoring of physical, cognitive, behavioral, physiological, and health-related activities. The VA cohort consists of volunteers living in largely rural communities in the Pacific Northwest, self-identified as being a Veteran, and included their cohabitant, if applicable. Nightly hours of sleep were estimated using a wrist worn device and baseline one month averages were compared with rural status and cognitive function.

**Result:** 114 nondemented participants from 67 homes underwent neuropsychological testing and passive monitoring of daily activities (55% male, age 70.7, MOCA 23.4). 70% resided in a rural area, defined as having a rural-urban commuting area (RUCA) score of 4 or higher (30% urban, 28% large-rural, 34% small-isolated-rural). Participants with 7+ days of recorded sleep measured within a one-month period near baseline cognitive assessments were included in the analysis ( $n = 99$ ). Mean hours of sleep obtained over an average of 24.4 days was 7.8 hours (SD 1.7). Participants living in urban areas slept less (7.3 hrs) than those living in large-rural (8.3 hrs) but not small-isolated rural areas (7.6 hrs) ( $p < 0.05$ ). Poorer executive function and global cognition were related to decreased sleep duration in Veterans living in small-isolated and large rural areas, respectively.

**Conclusion:** In a cohort comprised of mostly rural Veteran's and their spouses, living just outside of an urban area was associated with longer sleep duration. However, this relationship did not exist in Veterans living in smaller rural centers. Sleep duration was associated with poorer cognition in rural, not urban, Veterans. Passive, in-home monitoring can provide objective measures of sleep activity that may serve as a sensitive index of dementia risk and as a tool to investigate sleep dysfunction and its relationship with cognitive health in older rural Veterans.