that SWA may be related to pre-sleep learning and subsequent overnight memory consolidation processes. LTF testing may be useful in selecting individuals for preclinical AD trials. Future research on the impact of slow wave activity on LTF may be useful in identifying ways to enhance short- and long-term memory consolidation in individuals at greater risk for dementia.

Categories: Dementia (Alzheimer's Disease)
Keyword 1: dementia - Alzheimer's disease
Keyword 2: sleep
Keyword 3: neuropsychological assessment
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34 Machine Learning Predicts Time to Dementia Conversion in Cognitively Normal Subjects

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Objective: Identification of pre-clinical Alzheimer's disease (AD) is necessary for the development of future disease-modifying treatments, which would ideally target pre-clinical stages to mitigate functional loss. Despite advanced in biomarker development, clinical trials are still without a non-invasive and cost-effective means of identifying pre-symptomatic subjects who are at high risk for eventual conversion to AD. In previous work, we developed a machine learning algorithm using neuropsychological test scores and health history to identify subjects at high risk for eventual conversion. Here, we examine the performance of a similar algorithm in predicting the timing of that conversion in years.
Participants and Methods: Data were obtained from the National Alzheimer's Coordination Center (NACC) Uniform Data Set (UDS) version 3.0. Subjects with normal cognition at baseline were used to train a multi-class Random Forest classifier to predict conversion to AD . Each subject could be classified as a short-, mid-, or long-term converter (0-3 years, 4 to 6 years, and 7 to 9 years, respectively) or as a non-converter, if no dementia diagnosis was given within ten years of baseline. Predictors included baseline demographics, basic medical history, and neuropsychological test results. Algorithms were evaluated using standard, cross-validated performance metrics.
Results: Multi-class Matthews correlation coefficient between predicted time to diagnosis and the ground truth averaged 0.26 +/- 0.06 across 100 cross validation splits. Prediction accuracy exceeded 0.67 in all cases, when computed for each class individually, and was greatest for the short-term (0.75) and non-converter (0.78) classes.
Conclusions: Machine-learning algorithms applied to neuropsychological, demographic, and medical history information were able to predict the eventual timing of conversion to dementia in cognitively healthy adults significantly better than chance. Results were most accurate when predicting shorter time to conversion. Results illustrate the potential of this data analytic approach for targeted recruitment in clinical trials.

Categories: Dementia (Alzheimer's Disease)
Keyword 1: dementia - Alzheimer's disease
Keyword 2: neuropsychological assessment
Keyword 3: technology
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35 The Effect of Diagnostic Method on Racial Disparities in Mild Cognitive Impairment and Dementia Diagnosis Using the NACC Database.

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