

# NeuropsychBrainAge: a biomarker for conversion from mild cognitive impairment to Alzheimer's disease.

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(Dated: July 13, 2023)

BrainAge models based on neuroimaging data have diagnostic classification power but have replicability issues due to site and patient variability. BrainAge models trained on neuropsychological tests could help distinguish stable mild cognitive impairment (sMCI) from progressive MCI (pMCI) to Alzheimer's disease (AD). A linear regressor BrainAge model was trained on healthy controls using neuropsychological tests and neuroimaging features separately. The BrainAge delta, predicted age minus chronological age, was used to distinguish between sMCI and pMCI. The cross-validated AUC of the ROC curve for sMCI vs pMCI was 0.91 for neuropsychological features in contrast to 0.68 for neuroimaging features. The BrainAge delta was correlated with the time to conversion, the time taken for a pMCI subject to convert to AD. The BrainAge delta from neuropsychological tests is a good biomarker to distinguish between sMCI and pMCI. Other neurological and psychiatric disorders could be studied using this strategy.

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