impairment (MCI). **Methods:** 19 patients with MCI and 18 age-matched controls underwent magnetic resonance imaging and cognitive assessment. Diffusion tensor imaging-based tractography was used to construct whole-brain tractograms, which were represented as network graphs weighted by fractional anisotropy of the edge between any two nodes. Whole-brain graph theoretical measures and local measures for the hippocampi and thalami were compared between groups and correlated with cognitive scores. Linear regression models were constructed to investigate how local and whole-brain measures predict episodic memory. **Results:** MCI patients showed reduced global efficiency (t=2.6, p=.019) and mean clustering coefficient (t=3.1, p=.005). In MCI, global efficiency was associated with episodic memory performance (r=.50, p=.042). Local efficiency of the left hippocampus was decreased in MCI (t=2.1, p=.045), while there were no group differences in clustering and efficiency for the right hippocampus and the thalami. Episodic memory correlated with local measures of the left hippocampus (local efficiency: r=.68, p=.003; clustering coefficient: r=.59, p=.012) and the left thalamus (local efficiency: r=.51, p=.038; clustering coefficient: r=.48, p=.049). Measures of network topology did not correlate with cognition in controls. When global efficiency was added to the regression models for episodic memory performance in MCI, the relationships with local efficiency and the clustering coefficient for the left thalamus were no longer significant. In contrast, measures of the left hippocampus retained independent relationship in combined regression models. **Conclusions:** Both local and whole-brain measures of network topology correlate with episodic memory in MCI. The influence of hippocampal connections is independent of global network structure. In contrast, alterations in global efficiency mediate the effect of thalamic connectivity on memory performance. Our results challenge the hippocampal-centred view by suggesting that episodic memory impairment might also be dependent on a distributed mnemonic system.

IC-P-026 FUNCTIONAL CONNECTIVITY WITHIN NEUROANATOMICAL SUBSTRATES OF ALZHEIMER'S DISEASE

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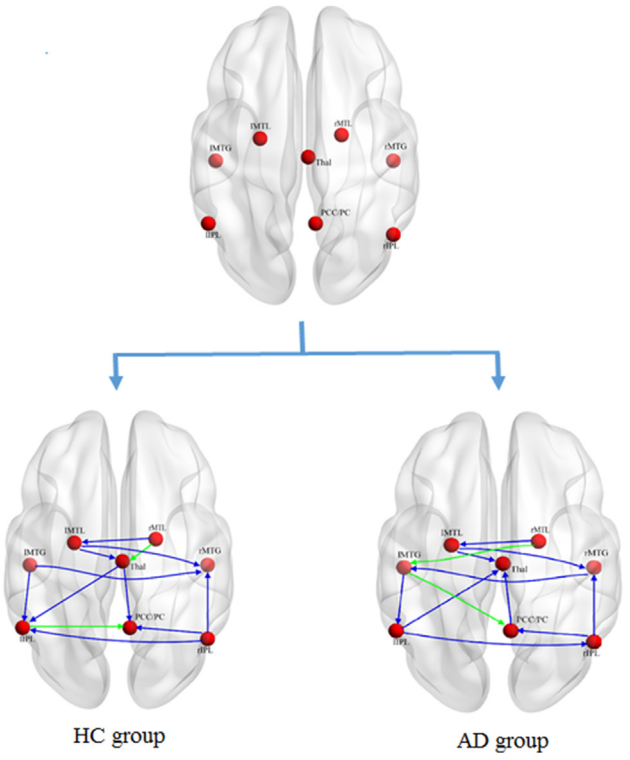
Background: Moving beyond the canonical functional networks and descriptive brain network modeling methods, we attempted to construct a node-and-edge network of Alzheimer's disease (AD) constrained by disease-specific grey-matter volume perturbations. **Methods:** The resting-state functional network structure was estimated by computing edges between voxel-based morphometry (VBM) data-derived 8 nodes with Bayesian estimation methods suitable for time-series data. **Results:** Independently computed group-wise network models were comparable; 10 out 12 paths were common to both AD and control groups (fig). Major difference in the networks of two groups were in terms of connectivity strengths reflected by edge coefficients. In AD group, connectivity strength measures could significantly predict AD disease severity measured by CDR-SB (r^2=0.77, p=0.015). **Conclusions:** This novel and data driven network modeling can quantify resting state connectivity strengths and provide a reliable marker of disease identification, progression and treatment response.



IC-P-027 LANGUAGE FLUENCY PREDICTS RESTING STATE NETWORK CONNECTIVITY PATTERN

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Background: Alzheimer's disease (AD) is often recognized as a disconnection disorder in which pathophysiological changes lead to reduced communication and coordination among regions important for cognition. Therefore, brain connectomic studies designed to examine disruptions of connectivity in AD have become increasingly common. We used resting-state fMRI (rsfMRI) in conjunction with connectomics to assess the relationship of cognitive variables associated with AD with brain network connectivity. Data from two separate cohorts were analyzed. **Methods:** Cohort1 included 74 older adult participants from the Indiana Alzheimer's disease Center, classified as cognitively normal (CN, 29), subjective cognitive

Model tested	F-value for model	P-value for model	β-coefficients	P-value for predictor
Cohort 1	3.17	0.0196*		
Age	–	–	0.000	0.46
Sex	–	–	0.004	0.17
Education	–	–	-0.001	0.06
Animal Fluency	–	–	0.001	0.00*
Cohort 2	4.70	0.0035		–
Age	–	–	-0.001	0.07
Sex	–	–	0.009	0.07
Education	–	–	-0.000	0.84
Animal Fluency	–	–	0.001	0.00*
Cohort 1	3.73	.0087		-
Age	–	–	0.000	0.89
Sex	–	–	0.004	0.20
Education	–	–	-0.001	0.27
Composite Language Fluency Score	–	–	0.004	0.00*
Cohort 2	4.50	.0044		–
Age	–	–	-0.001	0.01
Sex	–	–	0.008	0.12
Education	–	–	0.000	0.97
Composite Language Fluency Score	–	–	0.003	0.01*

decline (SCD, 22), mild cognitive impairment (MCI, 12), and AD (11). Cohort2 was a replicate sample of 58 older adult participants from the Indiana Memory and Aging study (CN, 13; SCD, 16; MCI, 21; AD, 8). Subjects underwent baseline rsfMRI; image data were processed with an in-house pipeline according to Power et al. [1]. Functional connectivity (FC) matrices were generated, which included FC data from 278 functionally-derived gray matter regions [2]. A data-driven connectivity approach (connICA) [3] was employed to extract independent FC patterns and how much each FC-pattern was present in each subject (weights). FC pattern weights were used as the dependent variable in a multilinear regression model with cognitive variables as predictors (Cognitive Complaint [4] and Cognitive Change [5] Index scores, episodic memory, executive function, animal fluency, and composite language fluency scores), with inclusion of nuisance variables. **Results:** Both datasets revealed a prominent resting state network pattern, as reported in Contreras et al [6]. In both cohorts, the RSN pattern was positively associated with animal and composite language fluency scores. Both language fluency measures were predictive of RSN pattern ($p<.005$, Table 1) demonstrating that participants with lower language fluency scores had lower FC within the canonical RSN pattern. **Conclusions:** Deficient performance on language fluency tests may be a good predictor of aberrant brain connectivity in early stages of AD. [1] Power et al(2014)Neuroimage; [2]Shen et al(2011)NeuroImage [3]Amico et al(2016)NeuroImage [4] Saykin et al(2006)Neurology [5] Rattanabannakit et al(2016)J Alzheimer's Dis [6] Contreras et al(2017)Alzheimers&Dementia.

IC-P-028 A COMPREHENSIVE ANALYSIS OF RESTING STATE FMRI MEASURES TO CLASSIFY INDIVIDUAL PATIENTS WITH ALZHEIMER'S DISEASE

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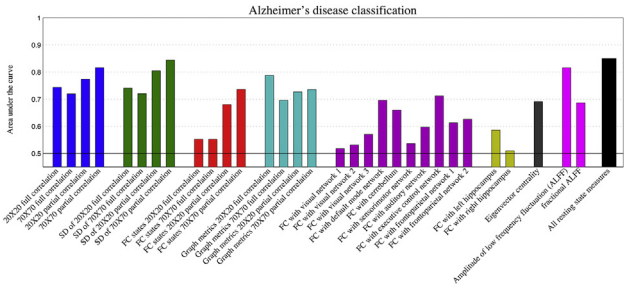

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Background: Alzheimer's disease (AD) patients show altered patterns of functional connectivity (FC) on resting state functional magnetic resonance imaging (RSfMRI) scans. It is yet unclear which RSfMRI measures are most informative for the individual classification of AD patients. **Methods:** We investigated this using RSfMRI scans from 77 AD patients (MMSE $= 20.4 \pm 4.5$) and 173 controls (MMSE $= 27.5 \pm 1.8$). We calculated i) FC matrices between resting state components as obtained with independent component analysis (ICA), ii) the dynamics of these FC matrices using a sliding window approach, iii) we distinguished five FC states and administered how long each subject resided in each of these five states, and iv) we calculated the graph properties (e.g., connection degree, and clustering coefficient) of the FC matrices. Furthermore, for each voxel we calculated v) FC with 10 resting state networks using dual regression, vi) FC with the hippocampus, vii) eigenvector centrality, and viii) the amplitude of low frequency fluctuations (ALFF). These eight measures were used separately as predictors in an elastic net logistic regression, and combined in a group lasso logistic regression model. We calculated the area under the receiver operating characteristic curve plots (AUC) to determine classification performance. **Results:** The AUC values ranged between 0.51 and 0.84 and the highest were found for the FC matrices (0.82), FC dynamics (0.84) and ALFF (0.82). The combination of all measures resulted in an AUC of 0.85. **Conclusions:** We show that it is possible to obtain moderate to good AD classification using RSfMRI scans. FC matrices, FC dynamics and ALFF are most discriminative and the combination of all the resting state measures improves classification accuracy slightly.

IC-P-029 GAUSSIAN MARKOV RANDOM FIELDS FOR ASSESSING INTERMODAL REGIONAL ASSOCIATIONS IN PRODROMAL ALZHEIMER'S DISEASE

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Background: Alzheimer's disease (AD) is characterized by a cascade of pathological processes that can be assessed in vivo using different neuroimaging methods. Recent research suggests a systematic sequence of pathogenic events on a global biomarker level, but little is known about the associations and