value ratio (SUVRs) ≥1.1, measured from a standard space template consisting of 6 cortical regions. For comparison to a whole-cerebellar reference region, a second normalization was performed on the longitudinal data using a centrum semiovale region as a correction factor (Figure). This method has been shown to improve signal to noise, while preserving the ability to use cerebellar SUVRs at baseline[1]. Analysis-of-Covariance models adjusted by baseline, study, treatment and age were used to assess baseline-to-endpoint change between treatment and placebo groups. For sample size estimations, 80% power and α=0.05 were used to detect magnitude of observed 18 month changes from baseline in the placebo group. **Results:** Using a whole-cerebellar reference region at baseline and endpoint, least squares mean SUVRs for the placebo group increased 0.004±0.0129 (0.49%±0.91), and for the active treatment group decreased 0.006±0.0137 (0.19%± 0.96)(p=0.62). Power analysis revealed a sample size of n=4056 to detect a difference between 18 month placebo group change and baseline SUVRs (i.e. no change in treatment group from baseline). White matter adjustments resulted in a mean increase of 0.011±0.0075 (0.79%±0.54) in the placebo group and mean decrease of 0.008±0.008 (-0.6%±0.57) in the active treatment group (p=0.08); the calculated sample size fell to n=421. **Conclusions:** Adjusting longitudinal SUVRs with a white matter reference region in these phase 3 anti-amyloid treatment trials increased mean change detection and decreased variance. This method resulted in a substantial improvement in statistical power to detect change. Reference: Abhinay Joshi, Michael Pontecorvo, Michael A. Navitsky, Ian A. Kennedy, Mark Mintun, Michael D. Devous. Measuring change in beta–amylod burden over time using florbetapir-PET and a subcortical white matter reference region. Alzheimer's Dement. 2014;10(4):902.

$$Visit\ 1 = \frac{\frac{Cortex\ V1}{Cereb\ V1}}{\frac{WM\ V1}{WM\ V1}} = \frac{Cortex\ V1}{Cereb\ V1} \qquad Visit\ 2 = \frac{\frac{Cortex\ V2}{Cereb\ V2}}{\frac{\frac{WM\ V2}{Cereb\ V2}}{\frac{WM V1}{Cereb\ V1}}} = \frac{Cortex\ V2 * WM\ V1}{Cereb\ V1 * WM\ V2}$$

Figure. Secondary normalization for white matter reference region
Figure: White matter normalization – the original baseline (Visit 1) cerebellar SUVR is used, but a new endpoint (Visit 2) accounts for the baseline to endpoint change observed in the WM.
WM = White Matter; Vl = Visit 1; V2 = Visit 2; Cereb = whole cerebellum

IC-P-031 MEDIAL TEMPORAL LOBE CHANGES WITH ENDOVASCULAR PROCEDURES

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Background: Vascular disease contributes powerfully to the trajectory of decline in AD and also to vascular dementia. Whereas the medial temporal lobes (MTL) are vulnerable to AD, this region is not typically a focus of study in vascular dementia. For patients with severely occluded carotid arteries, carotid endovascular procedures (carotid endartorectomy or stenting) are important interventions which rapidly restore flow to the brain and prevent stroke. Our lab has found that several patients undergoing these procedures experience memory declines. Because the MTL is crucial for memory we investigated whether there were volumetric changes in this region following endovascular procedures. **Methods:** Structural MRI (T1) images were collected in 42 patients before and after endovascular procedures. Postoperative MRI was collected within 48 hours after intervention. Automated volumetric measurement was performed using Freesurfer. The volumes were normalized (divided by the total intracranial volume) and difference scores comparing pre to post surgery were computed for each patient. These change scores were compared to zero using t-tests for each MTL. **Results:** T-tests comparing volumetric surgical change scores for left and right MTL indicated that there was an increase in volume from pre to post procedures bilaterally (p<.01). The effect was observed in most patients (31 in left MTL and 30 in the right MTL) irrespective of the side of the procedure. **Conclusions:** This is the first study to report an increase in MTL size associated with carotid endovascular procedures. The functional significance on cognition is unclear but the fact that procedures to treat occluded flow alter MTL volume suggests that vascular occlusive disease has direct effects on the MTL.

IC-P-032 QUANTIFYING NEOCORTICAL STRUCTURAL CHANGES FOR CLINICAL TRIALS IN ALZHEIMER'S DISEASE: COMPARISON BETWEEN TENSOR-BASED MORPHOMETRY AND LONGITUDINAL FREESURFER

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Background: Accurate and reliable quantification of structural brain changes, within a regulatory compliant framework, is important in clinical trials for Alzheimer's disease (AD). Cortical changes relevant to AD pathology have been reported in various regions including isthmus cingulate, precuneus, inferior parietal, temporal pole and prefrontal cortex[1,2]. We report the performance of atrophy measurements for these structures using tensor-based morphometry (TBM)[3], and compare to changes in cortical thickness measured with longitudinal FreeSurfer (LFS_Th)[4] on the standardized ADNI dataset[5]. **Methods:** 3DT1 MRI sequences from ADNI-1/2 were analyzed using pair-wise approaches to assess changes in volume (TBM) and cortical thickness (LFS_Th). Thickness changes over volume from the LFS processing suite was chosen for comparison due to lower variability (data not presented). Baseline and Month-3 data from 20 ADNI-2 normal controls

Table 1
Generalized AUCs for each cortical region and method at M12 and M24

	TBM Month-12	LFS Th Month-12	TBM Month-24	LFS Th Month-24
Temporal pole	0.72	0.64	0.76	0.69
Isthmus cingulate	0.69	0.61	0.74	0.63
Precuneus	0.67	0.61	0.68	0.61
Interior parietal	0.64	0.61	0.66	0.63
Prefrontal	0.62	0.56	0.68	0.65

Note: Generalized AUCs were calculated by computing probability that two random subjects are properly ranked with respect to ordinal outcome with two or more levels.