change, even after correcting for baseline cortical summary SUVR and other demographic variables (Fig 2). 3 uptake patterns predicted relative increases of 0.01 to 0.02 SUVR/year, while one uptake pattern predicted a relative decrease of 0.02 SUVR/year. **Conclusions:** These findings suggest that expression of specific uptake patterns provides predictive information about amyloid accumulation that is not available using global amyloid measures, and which would aid in identifying subsets of individuals at higher risk of accelerated accumulation.

IC-P-010 INCREASED SENSITIVITY OF AV45-PET FOR THE DETECTION OF EARLY STAGE AMYLOIDOSIS AFTER CORRECTION OF WHITE MATTER SPILL-IN EFFECTS

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Background: Amyloid-sensitive PET is an increasingly used biomarker for the detection of cerebral amyloid pathology but its sensitivity may critically depend on the way the PET scans are analyzed. Here we explored the effect of different image processing strategies on the concordance of amyloid-PET findings with cerebrospinal fluid (CSF) Aβ42 levels; an alternative biomarker of cerebral amyloidosis which typically shows only weak to modest associations with amyloid-PET findings in early phases of amyloid accumulation. **Methods:** We investigated the effects of 2- and 3-compartment models of partial volume correction (PVC-2/-3) and choice of reference region on the correlation between cortical AV45-PET uptake ratios (AV45-SUVR) and CSF-Aβ42 levels using data from 603 subjects enrolled in ADNI-2. Furthermore, in a subset of 152 cognitively normal subjects the ability to detect regional AV45-SUVR increases in groups with decreased CSF-Aβ42 levels was compared between the different processing approaches using voxel-wise analyses. **Results:** When using a whole cerebellar reference region, PVC-3, which also controls for spill-in effects of white matter (WM) signal, resulted in a significantly increased correlation of AV45-SUVRs with CSF-Aβ42 levels. This effect was most pronounced for the lower range of AV45-SUVRs (Figure-1), and was not observed for the simpler PVC-2 model that only controls for CSF dilution. Using PVC-3, cognitively normal subjects within the 3rd quintile of CSF-Aβ42 values (mean = 202 pg/ml) showed significantly increased AV45-SUVR values in fronto-temporo-parietal association areas compared to subjects within the highest CSF-Aβ42 quintile (≥ 241 pg/ml), and amyloid signal further extended across the cortex in subjects within the lowest CSF-Aβ42 quintiles (Figure-2). In uncorrected data, significant AV45-SUVR increases were only detected in subjects within the two lowest CSF-Aβ42 quintiles. Use of a WM reference region increased the correlation with CSF-Aβ42 in uncorrected PET data to a similar degree as PVC-3, and these effects were non-additive. **Conclusions:** Preprocessing techniques that account for the contamination of gray matter signal by unspecific WM binding can uncover biologically meaningful signal in AV45-PET scans that would typically be regarded as "amyloid-negative", and thus increase their sensitivity for detecting early stage amyloidosis.

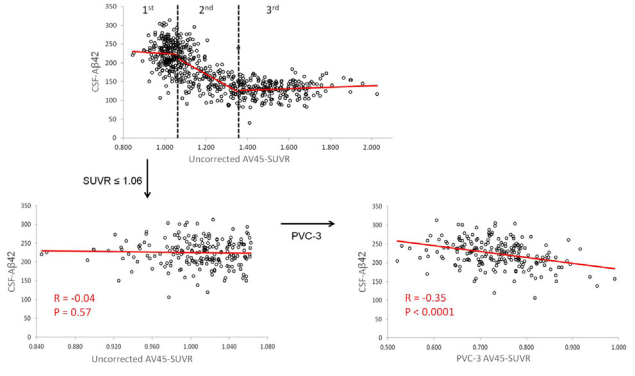

Figure 1. The effect of PVC-3 on the relation between cortical AV45-SUVRs and CSF-Aβ42 at the low range of AV45-SUVR values

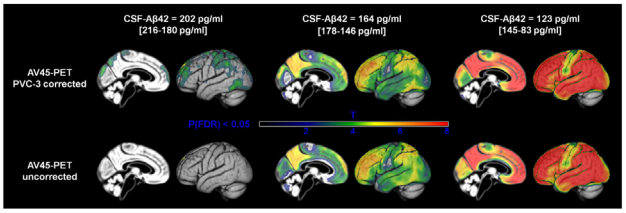

Figure 2. Regional AV45-SUVR increases in groups of cognitively normal subjects with decreased CSF-Aβ42 levels

IC-P-011 THE DIAGNOSTIC VALUE OF AMYLOID PET IN AN UNSELECTED COHORT OF MEMORY CLINIC PATIENTS

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Background: Earlier studies evaluating the diagnostic value of amyloid PET used highly selected study samples. We offered amyloid PET to all patients visiting our memory clinic and studied how amyloid PET impacted clinical diagnosis. In addition, we investigated whether appropriate use criteria (APUC) adequately identified patients that benefitted most from amyloid PET. **Methods:** From March to December 2015, we offered [^{18}F] florbetaben PET to all patients (n=443) visiting our memory clinic. Of all patients, 170/443 (38%) participated (64±7yrs; 61%M). PET scans were visually assessed as amyloid positive or negative. Before and after disclosure of PET results, one dedicated neurologist determined syndrome diagnosis and suspected etiology for each patient. Retrospectively and blinded to amyloid status, we applied APUC, which were positive when patients [A] had persistent or unexplained mild cognitive impairment (MCI), [B] satisfied core clinical criteria for possible AD with atypical clinical course or

Table 1
Appropriate Use Criteria in Demented and Non-Demented

	Dementia (n=95)				MCI (n=25)		CN (n=50)
	AD (n=68)		Non-AD (n=27)				
	APUC+ (n=45)	APUC- (n=23)	APUC+ (n=14)	APUC- (n=13)	APUC+ (n=18)	APUC- (n=7)	APUC- (n=50)
Age (SD)	65 (±7)	66 (±7)	65 (±10)	67 (±7)	65 (±7)	66 (±7)	61 (7%)
Males (%)	25 (56%)	9 (39%)	13 (93%)	9 (69%)	12 (67%)	6 (86%)	29 (58%)
MMSE (SD)	22 (±4)	21 (±5)	24 (±3)	23 (±6)	27 (±2)	27 (±2)	28 (±3)
[18F]FBB+ (%)	30 (67%)	21 (91%)	7 (50%)	1 (8%)	10 (56%)	5 (71%)	13 (26%)
Change in syndrome diagnosis (%)	2 (4%)	1 (4%)	0 (0%)	0 (0%)	1 (6%)	1 (14%)	3 (6%)
Change in suspected etiology (%)	15 (33%)	1 (4%)	4 (29%)	0 (0%)	5 (28%)	2 (29%)	14 (28%)

etiologically mixed presentation, or [C] that were young (≤65) with dementia. **Results:** Patients who participated (n=170) did not differ in age and sex compared to non-participants (n=273), but had slightly higher MMSE (25±5 vs. 23±6; p0.02). Of participating patients, 95(56%) were demented, 25(15%) had MCI and 50(29%) were cognitively normal. After disclosure of PET results, syndrome diagnosis changed in 8(5%) patients. In demented patients, suspected etiology changed in 16/68(24%) patients with pre-PET suspected AD etiology, and in 4/27(15%) with suspected non-AD etiology. In non-demented patients, suspected etiology changed in 6/18(33%) with pre-PET suspected AD etiology, and in 15/57(26%) with suspected non-AD etiology. When we applied APUC (Table 1), 59/95 dementia and 18/25 MCI patients met the criteria. By definition, cognitively normals were APUC-. In dementia, suspected etiology changed in 19/59(32%) for APUC+, compared to 1/26(4%) in APUC-. In non-demented patients, suspected etiology changed irrespective of APUC status (APUC+28%; APUC-28%). **Conclusions:** In an unselected sample of memory clinic patients, amyloid PET has diagnostic value as it contributes to the ideas regarding suspected underlying etiology in a substantial number of patients. APUC are helpful to identify patients with dementia who may benefit from amyloid imaging, but do not adequately identify non-demented patients benefitting from amyloid PET.

IC-P-012 AMYLOID PET IN CLINICAL PRACTICE

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Background: Amyloid PET imaging has been considered as a major advance in the clinical assessment of patients with cognitive impairment; however there is lack of agreement regarding the use of Amyloid PET scanning in the routine clinical evaluation of dementia. The Alzheimer's Association and the Society of Nuclear Medicine and Molecular Imaging formulated appropriate use criteria (AUC) for amyloid PET imaging in clinical settings especially when knowledge of the presence or absence of amyloid-beta pathology is expected to increase diagnostic certainty and alter the clinical management of the patients. Aims; To analyse the evidence for the use of Amyloid PET scanning in the clinical context and to understand whether any baseline clinical variables reliably differentiated negative from positive Amyloid -PET scan patients. **Methods:** In this observational cohort study we analysed the clinical data for 35 patients meeting AUC who had F-18 florbetapir Amyloid PET scans. **Results:** 42% (15/35) Amyloid positivity was observed in the cohort. The positivity in the subgroup of Amnestic Mild Cognitive Impairment (aMCI) was 75% followed by Probable Alzheimer's Disease (AD) 66.6%, Possible AD 43% and complex patients with diagnostic uncertainty 30%. **Conclusions:** The data confirms that the presence/absence of amyloid pathology in the brain on amyloid PET scans, can serve as important diagnostic confirmatory tool even when the diagnosis is made by expert clinicians. Also it shows that in clinically challenging presentations of dementia syndrome with a heterogeneous aetiology, confirmation of the absence of amyloid brain pathology can aid in excluding AD. Other significant observations in the study include increased amyloid positivity in the aMCI group with stronger correlation with reduced perfusion to temporo-parietal region on a blood flow SPECT scan and the presence of family history of AD.

IC-P-013 PET STAGING OF AMYLOIDOSIS: EVIDENCE THAT AMYLOID OCCURS FIRST IN NEOCORTEX AND LATER IN STRIATUM

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Background: Autopsy studies in sporadic Alzheimer's disease (AD) support the hypothesis that fibrillary amyloidosis (Aβ) occurs first in neocortex and later in striatum. We tested whether Aβ-PET could identify this sequence *in-vivo*, and potentially provide a staging measure for Aβ, in the Alzheimer's Disease Neuroimaging Initiative (ADNI) and the Harvard Aging Brain Study (HABS). **Methods:** We included 1087 ADNI (367 cognitively normal (CN), 523 mild cognitive impairment (MCI), and 197AD) and 336 HABS (275CN, 46MCI, and 15AD) subjects with Aβ-PET (ADNI: [18F]-Florbetapir/AV45, ADNI composite reference; HABS: