Table 1
Distribution of subjects by Aβ-stages, defined by neocortex (CX) and striatum (STR) baseline PET

Aβ Stages	Stage 0	Stage 1	Stage 2	Indeterminate
Aβ Signal in CX/STR	Low CX Low STR	High CX Low STR	High CX High STR	Low CX High STR
AD (ADNI, n=197)	12%	19%	68%	<1%
MCI/AD (HABS, n=61)	36%	10%	54%	0%
MCI (ADNI, n=523)	40%	29%	31%	<1%
CN (ADNI, n=367)	61%	30%	8%	<1%
CN (HABS, n=275)	72%	14%	14%	0%

MCI and AD subjects in HABS have been grouped for power issues

[C11]-PiB, cerebellar gray reference). Subjects were classified as high or low Aβ in neocortical and striatal (caudate and putamen) aggregates, using Gaussian mixture models. We evaluated changes in Aβ classification between baseline and follow-up Aβ-PET (0.9-5.1 years), and the association between Aβ classification at baseline and longitudinal memory performance, longitudinal hippocampal volume, and cross-sectional tau-PET ([18F]-T807/AV1451). **Results:** Both cortical and striatal AV45/PiB have bimodal distribution (Lilliefors KS-test>0.1, p<0.001), allowing categorization. Striatal Aβ is elevated only if cortical Aβ is elevated, classifying subjects in three Aβ-stages: stage 0: low-Aβ in both regions, stage 1: high-cortical but low-striatal Aβ, stage 2: high-Aβ in both regions. Less than 1% of subjects have an indeterminate stage: high-striatal but low-cortical Aβ (Table 1, Figure 1). Subjects with Aβ-stage 0 at baseline are more likely to transition to high cortical than to high striatal Aβ after follow-up (ADNI: χ^2=26.2, p<0.001; HABs: χ^2=4.9, p=0.026). Aβ-stage 1 subjects are more likely to transition to high striatal Aβ than Aβ-stage 0 subjects (ADNI: χ^2=19.6, p<0.001; HABs: χ^2=33.5, p<0.001, Figure 2). Subjects with high-striatal Aβ at baseline are more at-risk for longitudinal memory decline, longitudinal hippocampal atrophy, and tau deposition than subjects with low-striatal Aβ, even among subjects with high-cortical Aβ (Table 2). **Conclusions:** Both datasets provide evidence that striatal Aβ accumulation occurs after neocortical Aβ, at later disease stages. Striatal Aβ is a risk factor for memory decline, hippocampal atrophy, and tau deposition, making it a potentially useful biomarker for tracking disease progression. Further work is ongoing to determine the potential added value of striatal Aβ for predicting cognitive decline in preclinical stages.

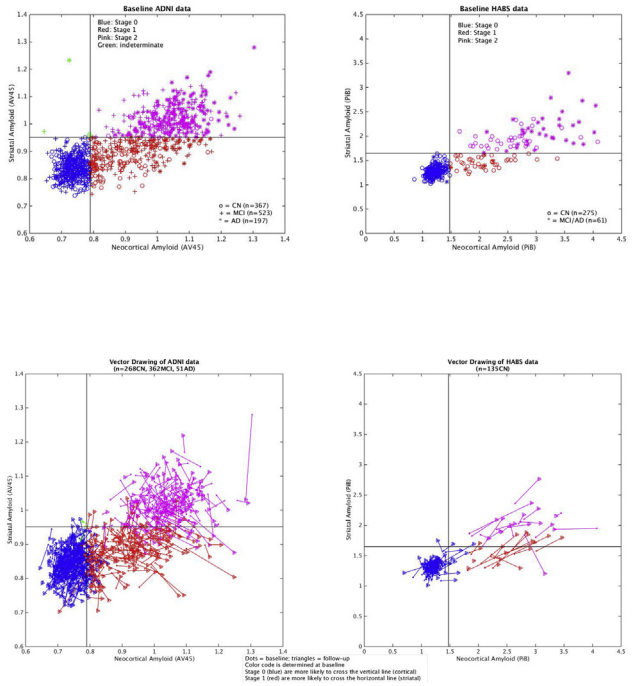

Table 2
Association between Aβ-stages and: (1) longitudinal memory decline (2) longitudinal hippocampal volume and (3) cross-sectional tau (entorhinal and inferior temporal aggregate, cerebellar gray reference)

Comparison	Stage 1 vs 0	Stage 2 vs 0	Stage 2 vs 1
Memory, ADNI (All: n=1087)	T=-4.9, p=e-5	T=-16.6, p=e-60	T=-10.8, p=e-27
Memory, ADNI (CN: n=367)	T=-3.1, p=0.002	T=-3.3, p=0.001	T=-0.9, p=0.352
Memory, HABS (All: n=332)	T=-2.7, p=0.006	T=-6.6, p=e-11	T=-2.5, p=0.011
Memory, HABS (CN: n=275)	T=-2.9, p=0.004	T=-4.9, p=e-5	T=-1.3, p=0.193
Hippocampus, HABS (CN: n=141)	T=+0.4, p=0.707	T=-2.0, p=0.046	T=-1.8, p=0.077
Tau, HABS (CN: n=121)	T=+1.9, p=0.057	T=+5.4, p=e-7	T=+2.6, p=0.010

Linear mixed models with random intercept and slopes, adjusted for age and sex (and education for memory)

IC-P-014

COMBINATION OF VERBAL DELAYED RECALL, STROOP COLOR-WORD, AND MRI CAN BE UTILIZED FOR THE DISCRIMINATION OF AMYLOID DEPOSITION STATUS IN MCI INDIVIDUALS

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Background: It is important to know whether a mild cognitive impairment (MCI) patient has significant amyloid deposition to characterize the brain condition and predict the prognosis. We tried to compare the ability of various clinical, neuropsychological, structural imaging information, and their combinations for the discrimination of amyloid deposition positivity in the brain of MCI individuals. **Methods:** Thirty amnestic MCI subjects were

included. All the subjects underwent standardized clinical evaluation and neuropsychological tests including the Subjective Memory Complaints Questionnaire(SMCQ), Seoul Informant Report Questionnaire for Dementia(SIRQD), Clinical Dementia Rating(CDR), CERAD neuropsychological battery, stroop test as well as Apolipoprotein E(APOE) allele typing, MRI, and Pittsburgh compound B PET(Pib PET). PiB PET Images were classified as amyloid deposition positive if the mean ^{11}C-PiB retention value was over 1.4 in one of the following regions: the frontal, lateral temporal, lateral parietal, precuneus/posterior cingulate cortices. In MRI, we measured mean gray matter(GM) thickness using freesurfer. **Results:** Among 30 subjects, 18 subjects classified as amyloid deposition positive group(MCI+). Compared to amyloid deposition negative(MCI-) group, MCI+ group showed significantly higher APOE e4 allele frequency, lower word list recall, higher stroop color-word test scores and lower mean cortical thickness in MRI. When amyloid deposition positivity prediction models based on logistic regression analyses were compared, the combined model of CERAD word list recall, stroop color word test, and MRI mean cortical thickness was the best discrimination model after adjusting age, education, and APOE e4 allele frequency(the prediction accuracy 90 %). **Conclusions:** Our results suggest that the combination of verbal delayed recall, stroop color-word test, and cortical thickness on MRI may be useful for the discrimination of amyloid deposition status.

IC-P-015 AMYLOID-POSITIVE VERSUS NEGATIVE AMCI: SIMILARITIES AND DIFFERENCES IN NEUROPSYCHOLOGY AND NEUROIMAGING PROFILES

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Background: Patients with amnestic mild cognitive impairment (aMCI) are heterogeneous as regard to their amyloid status. As amyloid is thought to accumulate decades before first symptoms, patients who already have cognitive deficits but have no amyloid deposition raise questions regarding the origin of symptoms and offer a great opportunity to investigate the long term effect of amyloid deposition on brain and cognition. There has been no study to date assessing both cognition and brain structure and function to provide a comprehensive picture on what is similar and different between amyloid positive (Aβ+) versus amyloid negative (Aβ-) aMCI. **Methods:** Forty five aMCI patients all recruited and scanned in the same centre were dichotomized into Aβ+ and Aβ- subgroups based on cerebral Florbetapir SUVR (and a threshold based on healthy population). All patients underwent a 3T T1 structural MRI, FDG-PET scans and neuropsychological assessment. Data were compared between aMCI subgroups and to 24 matched healthy elderly Aβ- (HE). Neuroimaging data analyzes included volume and metabolism comparisons within specific AD-sensitive regions-of-interest and voxelwise analyses with SPM. **Results:** Aβ+ and Aβ- aMCI were significantly impaired in most neuropsychological tests compared to HE. Aβ+ aMCI had lower performances in episodic memory than Aβ- aMCI, while Aβ- aMCI had worse scores than Aβ+ aMCI in executive and language functions. Aβ+ and Aβ- aMCI both showed significant (FWE $p < 0.05$ cluster-level corrected) hippocampal atrophy and parieto-temporal hypometabolism compared to HE, but there was no significant difference voxelwise between aMCI subgroups. Only a trend for lower hippocampal volume in the Aβ+ aMCI compared to the Aβ- aMCI ($p=0.05$ and 0.08 for the right and left hippocampus respectively) was found when using a ROI approach. **Conclusions:** These results might be interpreted in two ways. First, they suggest that the detailed neuropsychological profile is more helpful in predicting the amyloid status than the atrophy/hypometabolism pattern at the MCI stage. Second, the fact that both aMCI subgroups exhibit the same patterns of atrophy and hypometabolism suggests either that these patterns are not related with amyloid deposition or that different pathological processes conduct to the same brain alterations in aMCI.

IC-P-016 IS THE INCREMENTAL DIAGNOSTIC VALUE OF AMYLOID-PET AFFECTED BY INFORMATION ON OTHER CORE BIOMARKERS?

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Background: A rationale use of biomarkers for Alzheimer Disease (AD) diagnosis requires the definition of an optimal algorithm to maximize information while minimizing examination costs. In this study, we investigate the selection of bio-marker examinations by dementia experts of 18 Italian memory clinics in their ordinary clinical diagnostic work-up assessing AD or Frontal-temporal disease (FTD), with the aim of assessing whether a more complete work-up would attenuate the incremental diagnostic value of amyloid-PET. **Methods:** From a naturalistic study evaluating the incremental diagnostic value of 18F-Florbetapir PET after routine clinical assessment, we considered the 210 subjects having a clinical diagnosis of AD or FTD. Clinical work-ups were categorized as "complete" if all structural (MRI or TC), functional and CSF were collected; "intermediate" if 2 exams were collected (structural and FDG-PET or structural and CSF), and "incomplete" when only structural imaging was available. We analyzed whether these 3 different work-ups affect the incremental value of amyloid-PET, performed on top of the traditional work-up, in terms of diagnostic changes, changes in diagnostic confidence and in treatment. Our hypothesis was that a more complete work-up would be associated with a lower incremental value of amyloid-PET. **Results:** Only 16 (7.6%) of 210 patients underwent a complete diagnostic work-up; 70 (33.3%) had an "intermediate" work-up, and diagnosis was based on the only structural imaging for 124 subjects (59.0%). A similar pattern was observed in AD and FTD separately (Figure). However, centres prescribing complete, intermediate and incomplete work-ups were differently represented for the two diagnoses. No statistically significant change emerged in diagnosis, diagnostic confidence or clinical management between complete, intermediate or incomplete assessments (Table). Stratifying patients for etiopathology (AD-FTD) or clinical severity (MCI-dementia) led to the same results. **Conclusions:** Collection of additional core bio-markers does not