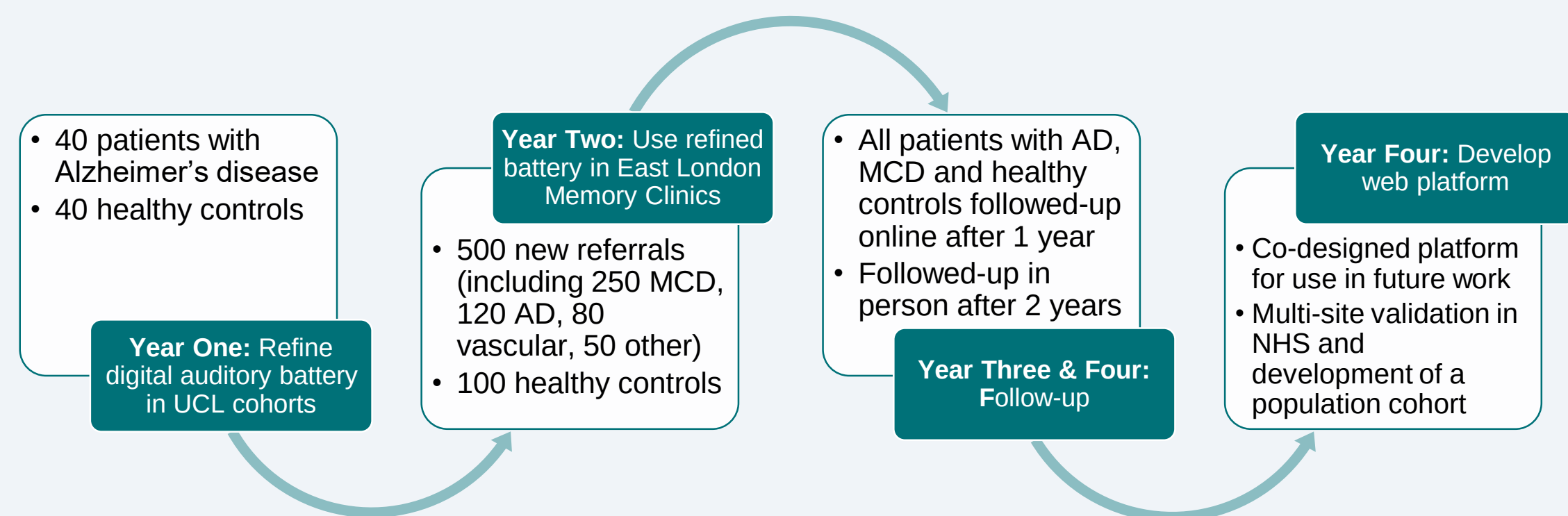


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Study Overview

DIADEM (Digital Assessment of Auditory Perception in Dementia) is a longitudinal, UK multisite study evaluating whether digital central auditory processing tasks can provide an objective, low-cost, and equitable method for the early detection of dementia.

- **470 participants** recruited across **17 NHS sites**.
- Currently in **Year 3 (24-month follow-up)**.



Methodology:

Assessments:

Central auditory processing test battery (SN, NV,DDT, NVDLT)= DIADEM digital auditory battery , pure-tone audiometry (PTA) to analyze peripheral hearing loss & Cognitive Assessments

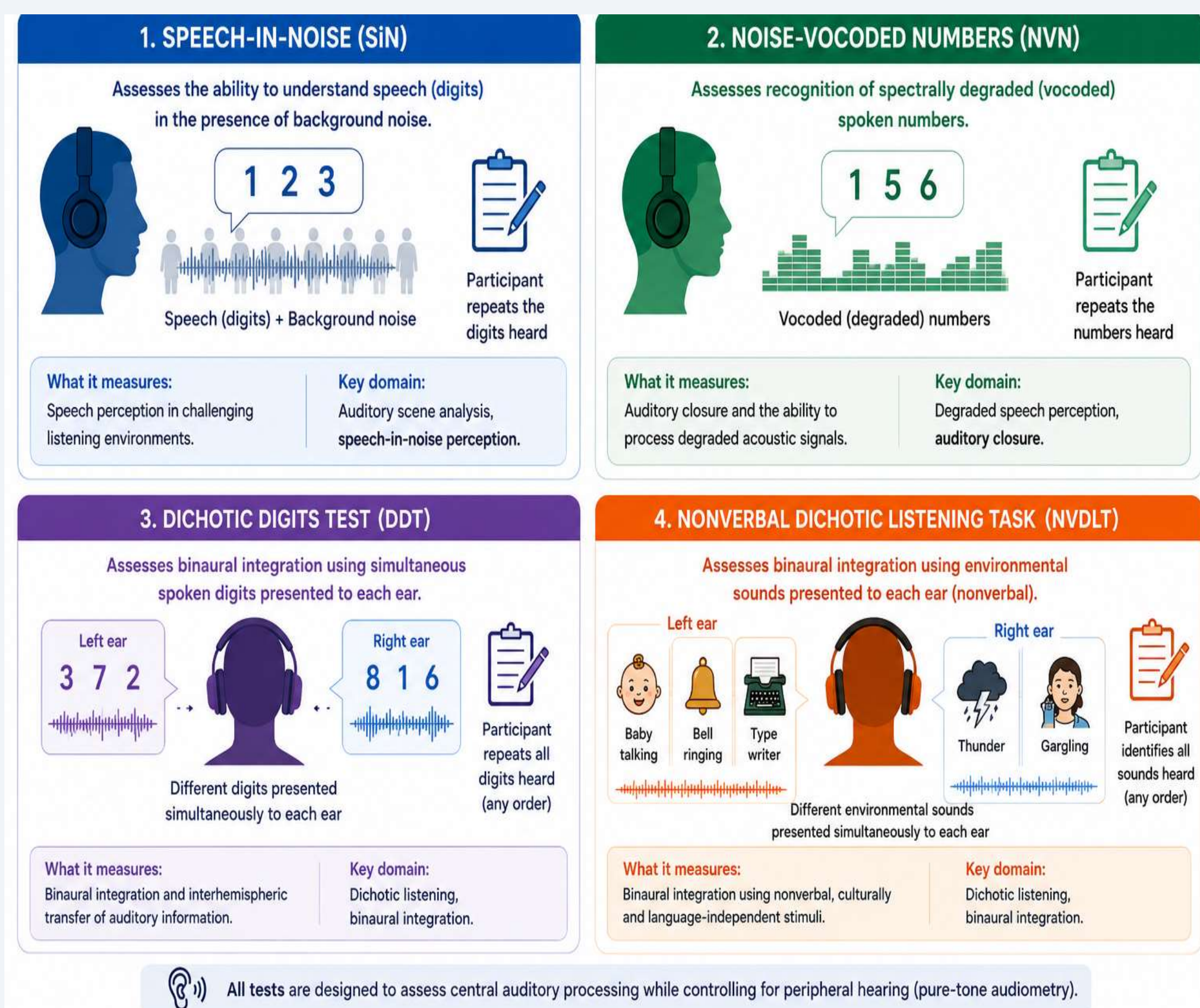
Biomarkers:

Plasma p-tau217 measured in a subset (n ≈ 360) to compare molecular and auditory diagnostic approaches.

Statistical Analysis:

Logistic regression (adjusting for age, sex, PTA) and ROC curve analyses assessing diagnostic accuracy of Nonverbal Dichotic Listening Task, plasma p-tau217, and their combination for AD vs. controls and all-cause dementia vs. controls.

What is DIADEM Digital Battery?



Research Objectives

Objective 1: Evaluate whether NVDLT discriminates AD from controls with clinically useful accuracy.

Objective 2: Compare NVDLT diagnostic performance with plasma p-tau217 in a multi-site UK cohort.

Objective 3: Assess whether combining NVDLT with p-tau217 further enhances diagnostic accuracy.

Results

Multicentre Network: Illustrates the 17 UK memory clinic partner sites spanning from Northern England to Southwest England, facilitating broad, nationally representative participant recruitment.

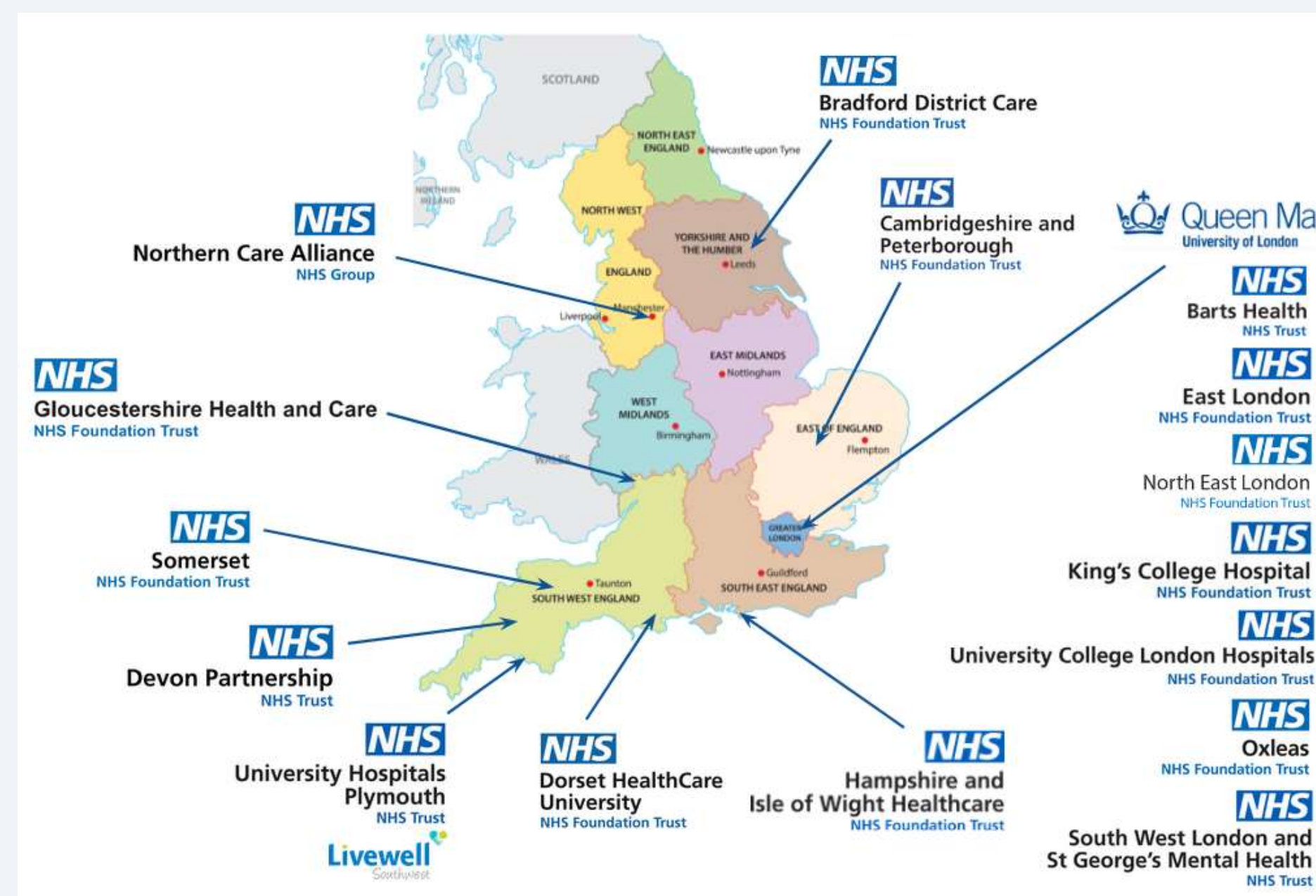


Fig.1. DIADEM partner sites

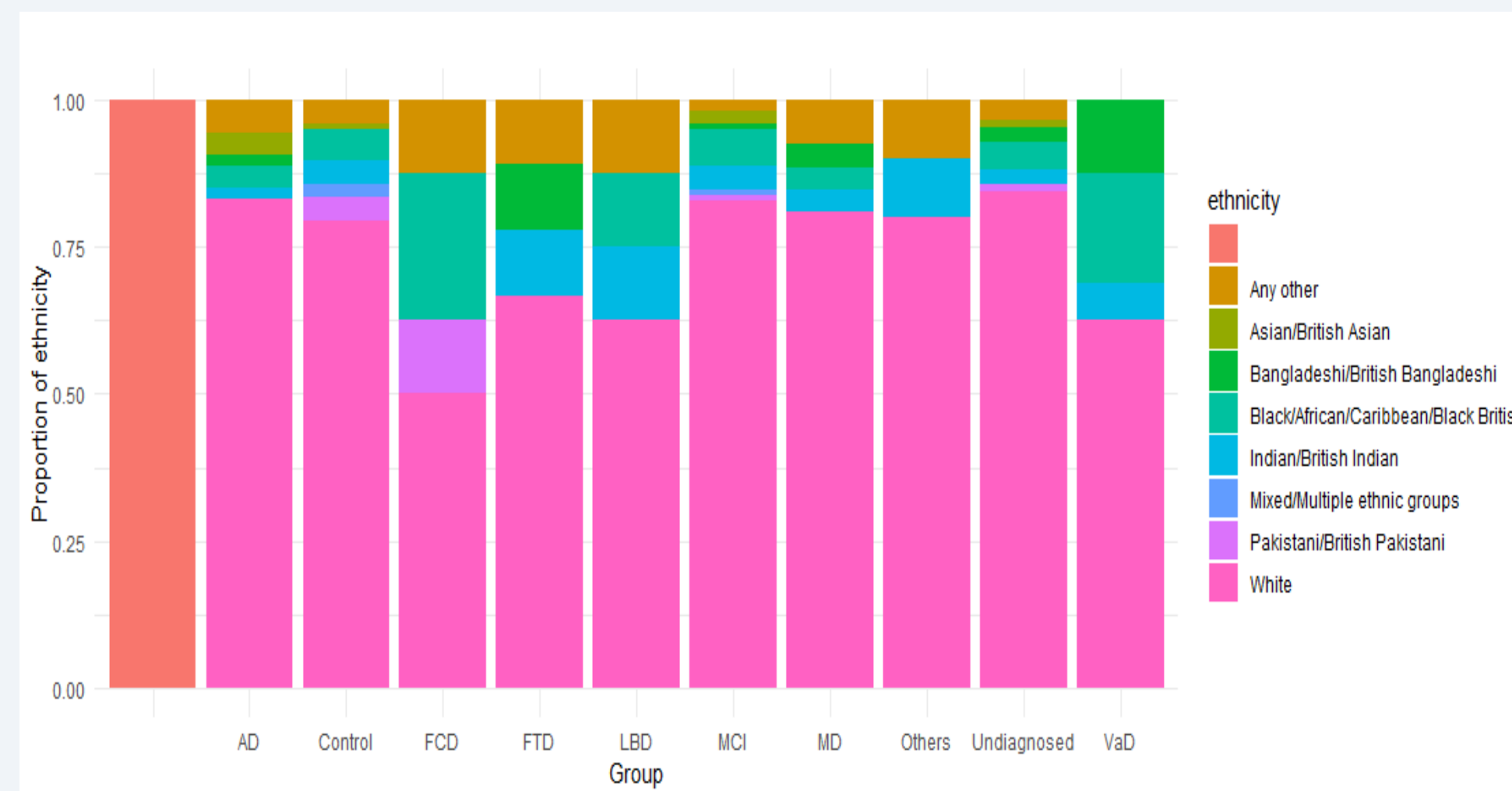


Fig.2. Proportion of ethnicity with memory clinic diagnosis in the DIADEM cohort. AD(Alzheimer's disease), FCD(Functional cognitive disorder), FTD(Frontotemporal dementia), MCI (Mild cognitive impairment), MD(Mixed dementia), Undiagnosed(still in the process to get diagnosis) VaD(Vascular dementia).

A total of **470 participants** were recruited via partner NHS Trust memory clinics across the UK.

The cohort is **80.2% White**, **8.3% South Asian**, **6% Black**, and **5.5% Any Other ethnicity**, reflecting the study's commitment to inclusive recruitment and equity. The study recruited **240 male** and **230 female** participants, with most in their **70s**, and an age range spanning from the **late 30s to 97 years**. All were referred to NHS memory clinics within **six months prior to recruitment**.

Key Finding

Combining NVDLT with p-tau217 achieves AUC = 0.978 for AD vs. controls — and NVDLT alone (AUC = 0.951) nearly matches plasma p-tau217 (AUC = 0.902) as a standalone diagnostic tool.

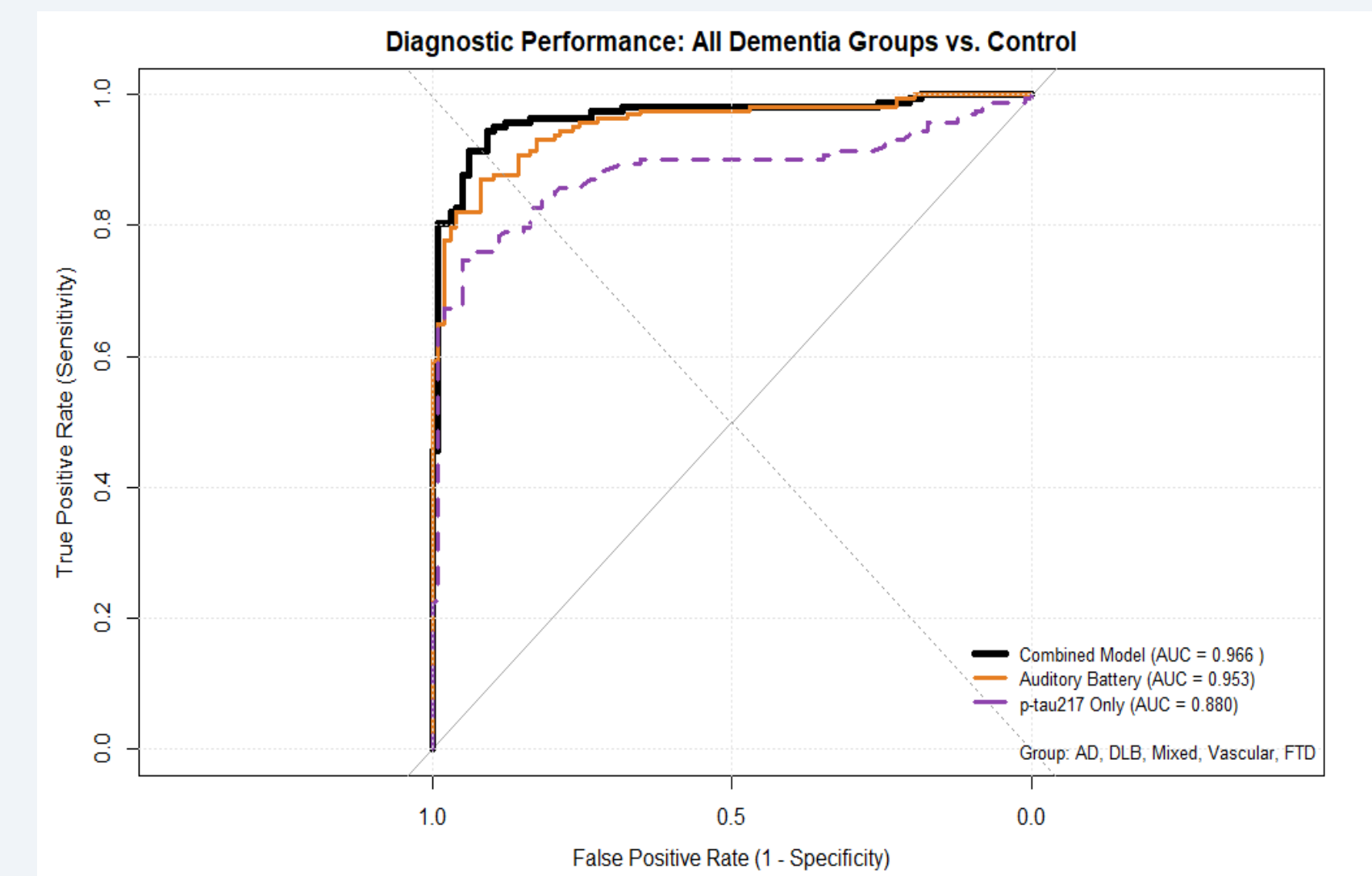


Fig. 3. ROC curves: All dementia groups vs. control. Combined Model AUC = 0.966, Auditory Battery AUC = 0.953, p-tau217 Only AUC = 0.880.

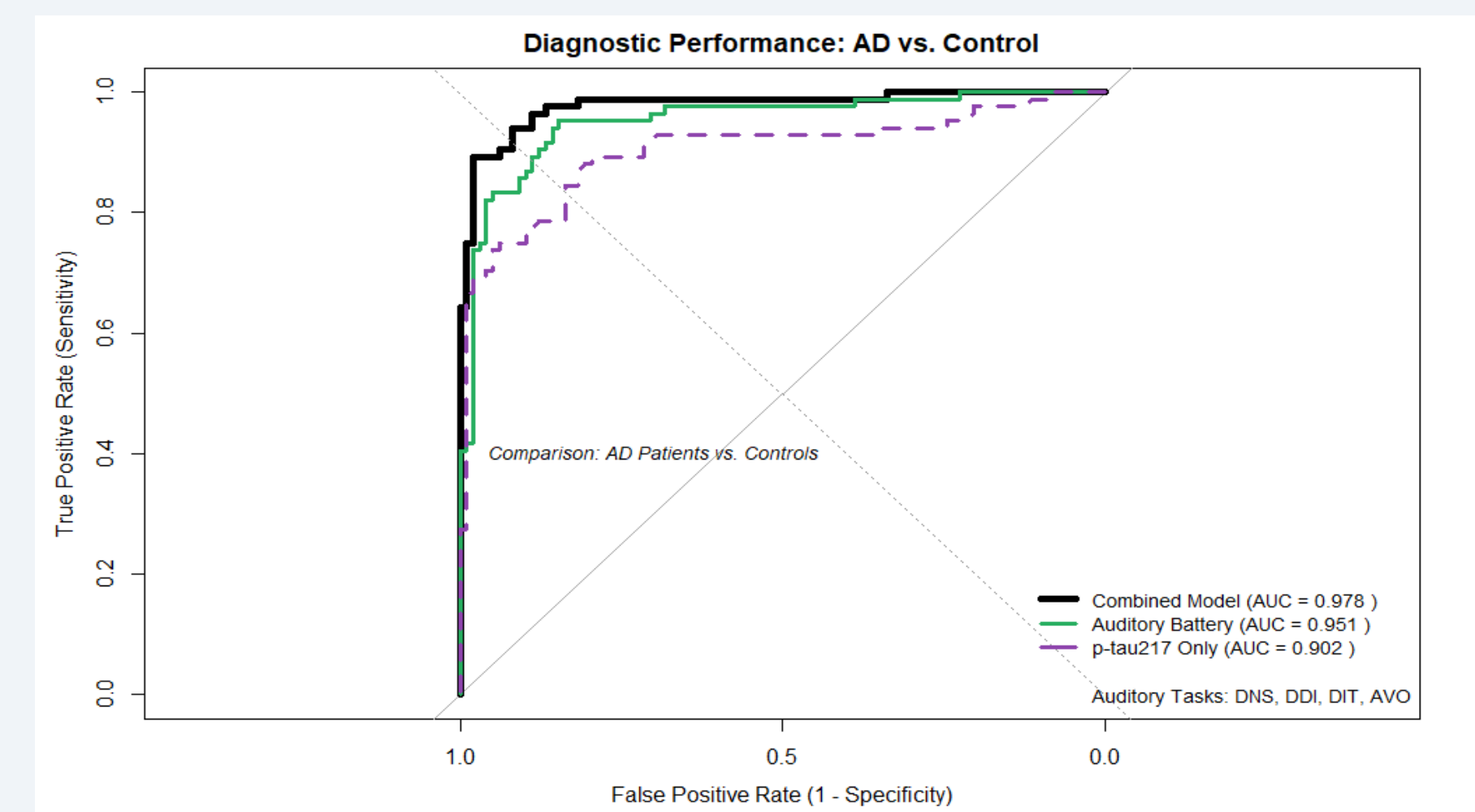


Fig. 4. ROC curves: AD vs. control. Combined Model AUC = 0.978, Auditory Battery AUC = 0.951, p-tau217 Only AUC = 0.902.

1. NVDLT alone achieves AUC = 0.951 for AD vs. controls, with diagnostic performance comparable to plasma p-tau217 .
2. Combining NVDLT with p-tau217 further improves accuracy (AUC = 0.978), supporting an integrated auditory-molecular screening strategy.

Conclusions

NVDLT may serve as a cost-effective, non-invasive front-line screening tool for AD in diverse, multi-site clinical settings.

Future Directions

Longitudinal follow-up of the cohort will assess whether central auditory measures predict conversion from MCI to AD and track disease trajectory over time in both MCI and AD patients.

Contact & More Info

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