Canadian ADNI

- Five sites across Canada
  - University of British Columbia-Vancouver Coastal Health (PI: Robin Hsiung)
  - Western University-London HSC (PI: Elizabeth Finger)
  - Western University-Parkwood Hospital (PI: Michael Borrie)
  - University of Toronto-Sunnybrook HSC (PI: Sandra Black)
  - McGill University-Jewish General Hospital (PI: Howard Chertkow)
  - Total recruitment

    ADNI-1: 49

    ADNI-GO: 11 (+20 rollover)

    ADNI-2: 48 (+24 rollover)

ADNI-2 Recruitment (with partial funding from CIHR)

- TOTAL: 48
- Normal controls: 7
- Subjective complaints: 5 (+1 currently in screening)
- Early MCI: 9
- Late MCI: 17
- AD: 10

- Screen fails: 24

- Rollover from ADNI-GO: 24

Canadian Institutes of Health Research: Medical Imaging Trial NEtwork of Canada (MITNEC)

Protocol Title: Amyloid and glucose PET Imaging in Alzheimer and Vascular Cognitive Impairment patients with significant White Matter Disease

Background

- Small vessel disease often coexists with Alzheimer's disease (AD) and can contribute to cognitive decline and progression to dementia.

- Longitudinal imaging using cerebral amyloid labeling may contribute understanding the additive/interactive effects of small vessel disease and AD (?related to reduced amyloid clearance).

Aims

- To determine in patients with significant WMD stratified by apolipoprotein E e4 status :

1) baseline prevalence and degree of uptake of amyloid on PET in relation to baseline clinical and multimodal brain imaging measures,
2) if baseline amyloid predicts increased amyloid deposition over 1 year

- To evaluate changes, if any, in amyloid uptake in correlation with the changes in clinical and structural and functional brain measures over 1 year.

Research Design

- Multiple sites nationwide – Starting with ADNI sites
  - Sunnybrook, London, Calgary, UBC
  - 150 patients (75 from stroke prevention clinics, 75 from memory clinics)
    - NC , MCI, and AD from ADNI-GO and ADNI-2 studies can serve as control groups

Subjects and procedures

- Recruitment period: 6-9 months
- Study protocol
  - 3T-MRI (structural, DTI, TF-MRI), FDG-PET, 18 florbetapir PET, Neuropsychological Testing, Blood Sampling (Apoe E e4) at baseline and at 12 months
  - Analysis pipelines designed to derive total supratentorial intracranial volume, tissue segmentation including grey, white, lesion subtypes (lacunar, deep and periventricular hyperintensities), with adapted free surfer application

Inclusion Criteria

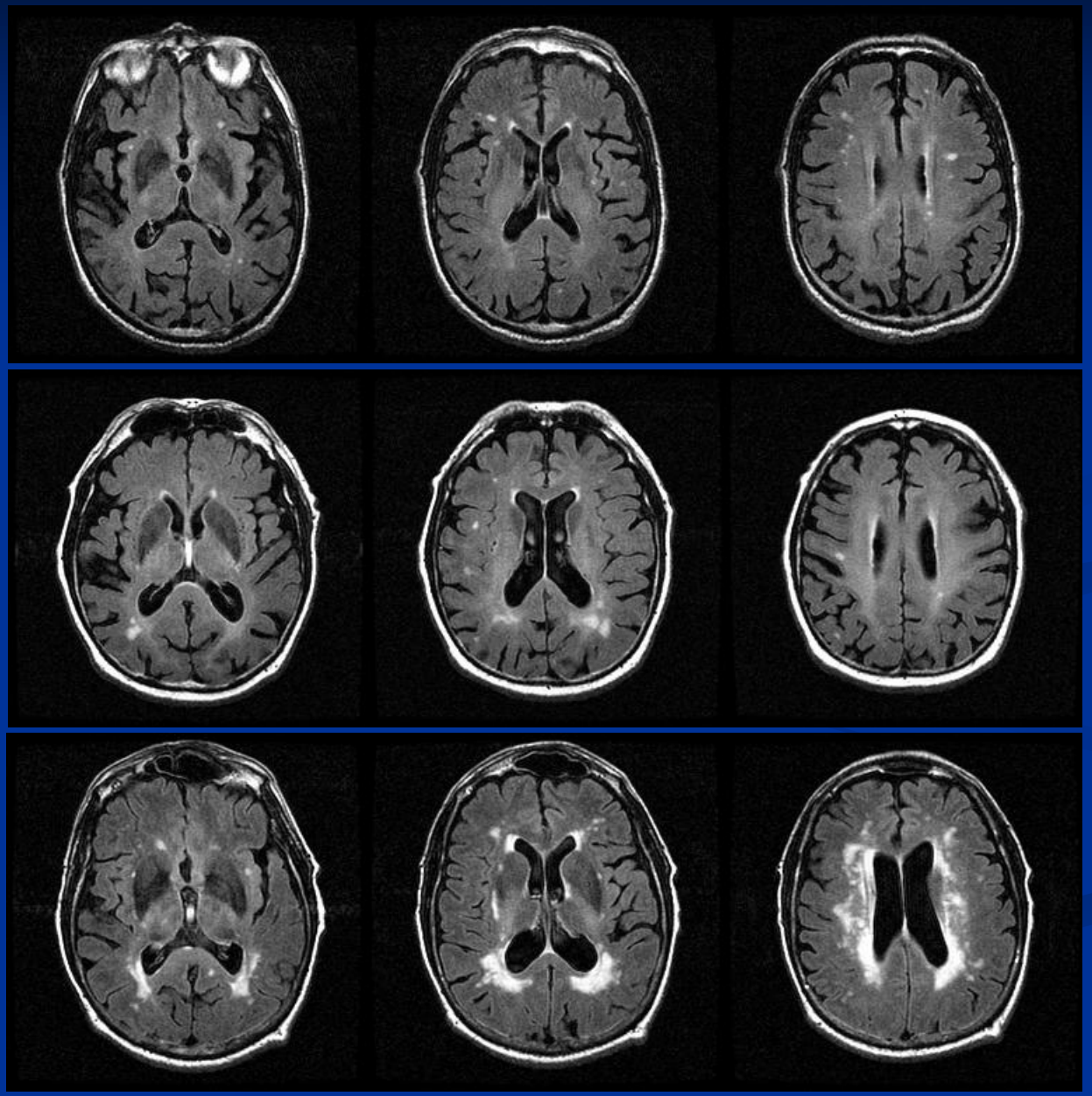
- > 60 or more years of age
- WMD score =3 on CT/MRI on Fazekas scale
- Memory clinic patients will meet criteria for amnestic or multi-domain MCI and mild early AD (MMSE > 20) using the same criteria as in the ADNI project
- TIA/minor stroke (lacunar, non cortical) with MMSE scores between 20 – 30

Fazekas Scores

Fazekas 1

Fazekas 2

Fazekas 3



Other Canadian Cohort studies

- **Ontario Brain Institute:** Integrated Discovery Program in Neurodegeneration(Vascular)-600 patient cohort across AD/MCI, FTD, ALS, PD/LBD, VCI
  - Utilizing 3T MRI, amyloid PET, ocular measures and eye tracking, genomics, neuropsychology, gait and balance
- **Canadian Institutes of Health Research:**
  - Canadian Consortium for Neurodegeneration and Aging (CCNA)(Howard Chertkow) and ADNI analysis grants
- **Brain Canada:**
  - Prevention clinical trials, support of platforms, cohort study underway in the Toronto Dementia Research Alliance- 320 MCI/early dementia in AD, PD/LBD/subcortical VCI/NC (neuroimaging, Optical Coherence Tomography, lens amyloid)

Canadian Cohort Studies

- More focus on neurodegeneration with co-morbid small vessel disease (SVD) and comparison across different misfolded proteins
  - Note that Cardiovascular Health Study reported that 28% of elderly have silent lacunes, and 95% have white matter hyperintensities (20% severe)
- Structural semiautomatic imaging pipelines to simultaneously quantify atrophy and SVD
- Population cohorts underway are adding harmonized structural brain and body imaging, with comparison potential including midlife