

HARMONIZATION OF PROTOCOLS FOR THE MANUAL SEGMENTATION OF THE HIPPOCAMPUS: AN EADC-ADNI JOINT EFFORT

In the field of Alzheimer’s disease (AD) research and drug development, there is an urgent need for a harmonized protocol aimed at estimating hippocampal atrophy accurately. In the revised criteria for the diagnosis of AD the estimate of hippocampal atrophy from structural magnetic resonance imaging (MRI) is a key supportive marker (Dubois et al., Lancet Neurol 2007;6:734-46). The potential availability of drugs that can effectively alter the progressive cognitive deterioration associated with AD makes diagnosis at the earliest possible stages imperative. The use of hippocampal atrophy as an outcome in trials of disease modifying drugs is clearly an area of active study and one where it will be important to compare and replicate measurements. While results of studies in different laboratories consistently show 15 to 40% tissue loss in AD patients vs. controls, agreement is lacking on the anatomical landmarks and measurement procedure. Without comparability of methods, it is impossible to determine whether these differences reflect a neurobiological heterogeneity or how much of this variance is determined by different measurement protocols.

The aim of this project is to develop an optimally harmonized measurement protocol for the estimation of hippocampal volume with manual tracing on MRI.

The project runs in phases, started with the extraction of differences among protocols selected from the Alzheimer’s literature. These differences have been operationalized into segmentation units and the contribution of each segmentation tracing unit to segmentation accuracy and volumetric differences between patients and controls has been tested. The results will be fed to a Delphi panel, to help them to take evidence based decisions and achieve a consensus on a harmonized protocol. When defined in all details, the harmonized protocol will be validated, and an online user-friendly educational “Segmentation Guideline” will be developed.

The availability of a standard and shared protocol for hippocampal volumetry will foster the validation of the new diagnostic criteria and their use in clinical settings, allow to compare the effect of disease modifying drugs, and represent the gold standard for automated segmentation algorithms. In the long run, the availability of a standard protocol will allow pooling data from compatible worldwide datasets thus leading to increased knowledge on the disease itself.

For further information, please visit: <http://www.hippocampal-protocol.net>.

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BOARDS. The Principal Investigator Giovanni B Frisoni (Brescia, Italy) and co-P.I. Clifford Jack (Rochester, MN, MR core leader of ADNI) will be supported by (i) a statistical working group headed by Simon Duchesne, Laval University, Canada, and including Louis Collins, MNI, McGill, Montreal and Patrizio Pasqualetti, AFaR, Roma; (ii) an advisory board including EADC PIs Bruno Vellas, Toulouse, France and Bengt Winblad, Stockholm, Sweden; ADNI PI Mike Weiner, UCSF, US; (iii) a clinical advisor, Pieter Jelle Visser, Maastricht, The Netherlands; (iv) a population studies advisor, Lenore Launer, NIA, Bethesda, (v) a dissemination and education advisor, Gunhild Waldemar, Copenhagen, Denmark; and (vi) industrial advisors, i.e. representatives from the sponsoring pharma companies.