

Methods of dementia, Alzheimer's disease, and MCI detection procedures, and consensus clinical diagnosis description

Methods for the Adult Changes in Thought (ACT) study have been published previously¹ and we borrow from that source and its supplemental materials. Study participants were assessed every two years with the Cognitive Abilities Screening Instrument, for which scores range from 0 to 100 and higher scores indicate better functioning.² The CASI assesses attention, concentration, orientation, memory, language, visual construction, verbal fluency, and judgment. Participants with scores of 85 or less underwent further clinical and psychometric evaluation, including a battery of neuropsychological tests. Dementia-free participants continued with scheduled follow-up visits. The incidence date was recorded as the halfway point between the study visit at which dementia was diagnosed and the previous visit.⁵

The dementia psychometric battery includes clock drawing⁶, verbal fluency⁷, Mattis Dementia Rating Scale⁸, Boston naming⁷, verbal paired associations and recall, logical memory and recall⁹, Word List Memory⁷, Constructional Praxis and recall⁷, Trails A and B¹⁰, and Information and Comprehension subtest items⁹. All clinical data are reviewed at a consensus conference. If dementia is diagnosed, clinical laboratories and imaging results are considered in assigning dementia subtype (e.g. Alzheimer's disease, thyroid disease, normal pressure hydrocephalus, vascular dementia, etc.). When these results are not available from medical records, they are requested to be ordered by the delivery system, results are obtained, and then reviewed again at a subsequent consensus conference.

These procedures have been used since 1986. ACT incidence rates are consistent with those found worldwide⁵, supporting the validity of our case definitions. Furthermore, forest plots of associations between single nucleotide polymorphisms and dementia from Alzheimer's disease suggest similar strength of association for cases and controls ascertained by the ACT study as those from more than a dozen other research studies of dementia from Alzheimer's disease¹¹.

The ACT neuropsychological battery is characterized by good assessment of executive functioning (Mattis initiation and concept scales, comprehension, Trails, fluency, and clock drawing) which would aid in identification of vascular cognitive impairment / vascular dementia and fronto-temporal dementia. There is good assessment of spatial ability (clock and Mattis construction) that would help with the diagnosis of Lewy body dementia and Parkinson's disease with dementia. It should be emphasized that the diagnostic process is based not only on psychometric test results but also on historical and clinical elements, all of which are considered by an expert consensus of clinicians and neuropsychologists using all available data including results from the psychometric tests.

Methods used by the University of Washington Alzheimer's Disease Research Center (UW ADRC) are established by a collaboration between the National Alzheimer's Coordinating Center, the National Institutes on Aging ADRC programs. Individuals from the community and from clinical referrals join the ADRC with a spectrum of diagnoses from cognitively normal to dementia. Subjects recruited into the ADRC are evaluated annually and a standardized clinical dataset, the Uniform Data Set (UDS), defined by NACC/ADRCs is collected. The UDS includes demographics, medical and medication history, family history, smoking and alcohol exposures, behavioral assessment, functional measures and availability of imaging, presence or autosomal dominant AD genetic variants, CSF and blood biomarkers. A standard neuropsychological battery is performed to include assessment of executive, language, memory, visuospatial, orientation and attention cognitive features. In both ACT and UW ADRC settings a comprehensive neurological evaluation, systematic cognitive assessment, and history from the individual and ancillary sources (e.g., spouse / caregiver / family members / others) are all considered by a multidisciplinary consensus conference, and NIH research criteria (e.g., McKhann criteria) are used based on all those data considered together. The same cognitive domains are tapped by the ACT and the UW ADRC batteries; however, there are select tests used for each of the cognitive elements that are specific to each center.

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