ADNI is currently accepting Letters of Intent to submit proposals concerning biomarkers or other assessment tools Read more

Welcome

The Alzheimer's Disease Neuroimaging Initiative (ADNI) unites researchers with study data as they work to define the progression of Alzheimer's disease (AD). ADNI researchers collect, validate and utilize data, including MRI and PET images, genetics, cognitive tests, CSF and blood biomarkers as predictors of the disease. Study resources and data from the North American ADNI study are available through this website, including Alzheimer's disease patients, mild cognitive impairment subjects, and elderly controls.

Click below to learn more or to join the ADNI study as a participant.

LEARN MORE

Returning Users

Welcome to the new website with added content for ADNI3. The site builds upon the ADNI1, ADNI-GO, and ADNI2 studies, public-private collaborations aimed at determining the relationships between clinical, cognitive, imaging, genetic, and biochemical biomarkers across the entire spectrum of Alzheimer's disease. ADNI3 will continue efforts to discover, optimize, standardize, and validate clinical trial measures and biomarkers used in AD clinical research.

Please comment on the website here.

ADNI 3 STUDY

ABOUT ADNI

The Alzheimer's Disease Neuroimaging Initiative (ADNI) is a longitudinal multicenter study designed to develop clinical, imaging, genetic, and biochemical biomarkers for the early detection and tracking of Alzheimer's disease (AD). Since its launch more than a decade ago, the landmark public-private partnership has made major contributions to AD research, enabling the sharing of data between researchers around the world.

Three overarching goals of the ADNI study are:

1. To detect AD at the earliest possible stage (pre-dementia) and identify ways to track the disease's progression with biomarkers.
2. To support advances in AD intervention, prevention, and treatment through the application of new diagnostic methods at the earliest possible stages (when intervention may be most effective).
3. To continually administer ADNI's innovative data-access policy, which provides all data without embargo to all scientists in the world.

HISTORY

ADNI began in 2004 under the leadership of Dr. Michael W. Weiner, funded as a private-public partnership with $27 million contributed by 20 companies and two foundations through the Foundation for the National Institutes of Health and $40 million from the National Institute on Aging. The initial five-year study (ADNI-1) was extended by two years in 2009 by a Grand Opportunities grant (ADNI-GO), and in 2011 and 2016 by further competitive renewals of the ADNI-1 grant (ADNI-2, and ADNI-3, respectively). Learn more about each phase of the study in the table below.

New participants were recruited across North America during each phase of the study and agreed to complete a variety of imaging and clinical assessments. Participants are followed and reassessed over time to track the pathology of the disease as it progresses. Results are then shared by ADNI through the USC Laboratory of Neuro Imaging's Image and Data Archive (IDA). Learn more about each phase of the study in the table below.

STUDY CHARACTERISTICS	ADNI-1	ADNI-GO (Grand Opportunities)	ADNI-2	ADNI-3
Primary goal	Develop biomarkers as outcome measures for clinical trials	Examine biomarkers in earlier stages of disease	Develop biomarkers as predictors of cognitive decline, and as outcome measures	Study the use of tau PET and functional imaging techniques in clinical trials
Funding	$40 million federal (NIA), $27 million industry and foundation	$24 million American Recovery Act funds	$40 million federal (NIA), $27 million industry and foundation	$ 40 million federal (NIA), up to $20 million industry and foundation
Duration/start date	5 years/October 2004	2 years/September 2009	5 years/September 2011	5 years/September 2016
Cohort	200 elderly controls 400 MCI 200 AD	Existing ADNI-1 + 200 early MCI	Existing ADNI-1 and ADNI-GO + 150 elderly controls100 early MCI 150 late MCI 150 AD	Existing ADNI-1, ADNI-GO, ADNI-2 + 133 elderly controls 151 MCI 87 AD

ADNI 3

ADNI3 began in 2016 and includes scientists at 59 research centers in the United States and Canada. Between 1070-2000 participants will be enrolled: approximately 700-800 rollover participants from ADNI2 and 370-1200 newly enrolled subjects. Clinical, cognitive, imaging, biomarker and genetic characteristics will be assessed across three cohorts: Cognitively normal, MCI and mild AD dementia.

ADNI3: WHAT'S NEW

In addition to all the biomarkers used in ADNI 2, ADNI 3 has the following changes and additions:

1. ADNI 3 includes longitudinal tau PET scans with AV 1451 provided by AVID. The study also includes the development of tau PET as a surrogate outcome measure for AD clinical trials.
2. For new ADNI 3 subjects, we will be using Florbetaben provided by Piramal for amyloid PET.
3. CSF amyloid and tau will be measured using a new immunoassay platform provided by Roche to determine how tau tangles are related to amyloid levels and to cognition.
4. MRI techniques from the Human Connectome Project will be used to map the effects of AD on brain connectivity. Protocols will be updated including 3D ASL perfusion imaging and Connectome sequences for appropriate scanners.
5. Use of high-powered MRI to detect very early structural brain changes in AD.
6. For the clinical battery, the Financial Capacity Instrument has been added and subjects will take Cogstate computerized testing in-clinic and at home and subjects will be invited to join the Brain Health Registry for at-home assessment. The Brain Health Registry also supports recruitment activities.
7. Use of Systems Biology approaches to understand AD genetics and its relationship to AD biology.
8. Development of models to select patients for AD clinical trials using Precision medicine

COHORT SIZE

	Rollover participants	New participants
Cognitively normal (CN) cohort	295-330	135-500
Mild cognitive impairment (MCI) cohort	275-320	150-515
Mild Alzheimer's disease dementia (AD) cohort	130-150	85-185

DOCUMENTS

The full list of ADNI documents can be found on the Documents page. New documents for ADNI 3 can be seen by clicking the links below. Study data and additional password-protected documents can be found in the Image and Data Archive, with instructions for access on the Access Data page.

STANDARDIZED MRI DATA SETS

In order to promote consistency in data analysis, standardized MRI imaging datasets have been developed for the acquired 1.5T and 3T scans. Researchers are encouraged to use these complete datasets in their analyses and to reference them in reporting results. Doing so will help support direct comparisons of various analysis methods. Details about the rationale and development of the standardized MRI datasets may be found in the document linked below.

MANUALS AND SCHEDULES

Procedures Manual

For manuals and study schedules, please visit the Documents page. For details on methods and protocols, please visit the Methods & Tools section. Study data and additional password-protected documents can be found in the Image and Data Archive, with instructions for access on the Access Data page. Additional information can be found in the Help/FAQ section.

MANUALS SCHEDULES METHODS PROTOCOLS

STUDY DESIGN

ADNI is a global research study that actively supports the investigation and development of treatments that slow or stop the progression of AD. In this multisite longitudinal study, researchers at 63 sites in the US and Canada track the progression of AD in the human brain with clinical, imaging, genetic and biospecimen biomarkers through the process of normal aging, early mild cognitive impairment (EMCI), and late mild cognitive impairment (LMCI) to dementia or AD. The overall goal of ADNI is to validate biomarkers for use in Alzheimer's disease clinical treatment trials.

ADNI has made a global impact, both by developing a set of standardized protocols to allow comparison of results from multiple center and by its data-sharing policy which makes available all ADNI data without embargo to qualified researchers worldwide. To date, over 1000 scientific publications have used ADNI data. A number of other initiatives related to AD and other diseases have been designed and implemented using ADNI as a model. ADNI has been running since 2004 and is currently funded until 2021.

DATA SHARING

One defining characteristic of ADNI is the commitment by all cores to share data without embargo and within hours of collection. All data generated by the ADNI study investigators are entered into the data repository hosted at the Laboratory of Neuroimaging (LONI) at the University of Southern California, the LONI Image & Data Archive (IDA). Qualified researchers worldwide can submit an online data access request and generally begin using ADNI data including cognitive/neuropsychological, image, biofluid and genetic data sets within a few days of request submission.

Thousands of data use applications have been received from investigators from across the globe and multiple disciplines leading to millions of data downloads. One measure of the success of this open data sharing approach is the number of scientific publications arising from ADNI data: currently over 1500 in a wide variety of fields including areas outside of Alzheimer's disease. Current usage stats are shown on the ADNI Data Usage Stats page and the list of ongoing investigations may be perused on the Ongoing Investigations page.

ADNI also contributes data to a number of consortia and big data projects which have the potential to unlock many of the mysteries of neurological diseases, including the Enhancing Neuro Imaging Genetics through Meta Analysis (ENIGMA) consortium and the Dialogue on Reverse Engineering Assessment and Methods (DREAM) Alzheimer's Disease Big Data Challenge #1 for the discovery of novel predictive AD biomarkers.

Studies using ADNI cross-sectional and longitudinal data from multiple modalities have reported that:

- AD pathology is already present in people with no outward sign of memory loss and these cognitively normal people may already have subtle brain atrophy
- There are typical patterns of amyloid deposition, declines in glucose metabolism, and structural brain changes that occur in AD
- Cognitive decline is more closely linked to tau then Aß deposition
- AD is characterized by the progressive disruption of the brain connectome. As the disease progresses, there are fewer connections between essential brain regions.
- Many genes in addition to *APOE4* underlie AD. ADNI data has helped to identify or confirm 10 of the approximately 20 genes currently identified
- Cerebrovascular disease can accelerate disease progression in AD
- Both the cognitively normal and MCI groups are pathologically heterogeneous. Some people show no signs of AD, some show signs of progressing to AD quickly, and others show signs of progressing to dementias other than AD

STUDY OBJECTIVES

Explore the distinct goals of each ADNI phase below; overall objectives can be found on the About page.

During the four phases of the ADNI study, to the extent possible, participants were carried forward from previous phases for continued monitoring, while new participants were added with each phase to further investigate the evolution of Alzheimer's disease.

ADNI enrolls participants between the ages of 55 and 90 who are recruited at 57 sites in the United States and Canada. After obtaining informed consent, participants undergo a series of initial tests that are repeated at intervals over subsequent years, including a clinical evaluation, neuropsychological tests, genetic testing, lumbar puncture, and MRI and PET scans.

View the clinical study schedule for all phases of ADNI below.