The BIOCARD Study

Biomarkers of Cognitive Decline Among Normal Individuals

MRI
LDDMM (Large Deformation Diffeomorphic Metric Mapping)
Limited Dataset

Glossary of Terms

Term	Description
Allowable Codes	codes (and their meanings) allowed to be values for that variable
Audit Findings	error rates based on BIOCARD or NIH phase audits error rates are calculated as number of errors / total number of variables examined
Baseline visit	date admitted to NIH phase of BIOCARD study *[Note: some data may have been collected prior to this date]*
Collection	when the variable information was collected (i.e., Baseline, Follow-up)
Comments	further information about the variable not covered in the above fields
Data Type	numeric or character *[Note: Dates are numeric data]* numeric or character classifications are strictly related to how the data are stored and not how the data should be analyzed
JHU phase	the study phase at JHU from 2009 - present
Missing OK If	instances (such as skips) or reasons why a blank or missing value is acceptable
NA	not applicable for this variable
NIH / NIH phase	the study phase that was performed at the NIH from 1995-2005
Question Text	the question as it appears on the NACC or BIOCARD data collection forms
Short Description	a short explanation of what the variable means
Source	the name of the NACC form, BIOCARD form, or NIH dataset containing the variable information (or "DERIVED" if the variable was derived) and the variable question number located on the form or in the dataset, if applicable
Unknown Code	the codes for the "unknown", "don't know", or missing values for the variable
Variable Name	the name of the variable in the provided dataset *[Note: Variables will follow the NACC naming scheme as closely as possible]*

Acronyms and Definitions

AD	Alzheimer's Disease
CDR	Clinical Dementia Rating
CERAD	Consortium to Establish a Registry for Alzheimer's Disease
CNS	Central Nervous System
CSF	Cerebrospinal Fluid
CVD	Cardiovascular Disease
CVLT	California Verbal Learning Test
FAQ	Functional Assessment Questionnaire
FTD	Frontotemporal Degenerations
GDS	Geriatric Depression Scale
JHU	The Johns Hopkins University
MCI	Mild Cognitive Impairment
MMSE	Mini-Mental State Examination
NACC	National Alzheimer's Coordinating Center
NIA	National Institute on Aging
NINDS	National Institute of Neurological Disorders and Stroke
NPI-Q	Neuropsychiatric Inventory Questionnaire
UPDRS	Unified Parkinson's Disease Rating Scale
WAIS	Wechsler Adult Intelligence Scale
WMS	Wechsler Memory Scale

MRI Data Limited Dataset Characteristics

Number of variables: 12

Order of variables:

1) JHUANONID *Participant ID Anonymized by JHU*
2) VISITNO *MRI visit number*
3) MRIMOBL *Months from baseline*
4) INTRACVOL *MRI: Intracranial volume (cubic millimeters)*
5) AMYLEFTV *MRI: Left amygdala volume (cubic millimeters)*
6) AMYRIGHTV *MRI: Right amygdala volume (cubic millimeters)*
7) HIPLEFTV *MRI: Left hippocampus volume (cubic millimeters)*
8) HIPRIGHTV *MRI: Right hippocampus volume (cubic millimeters)*
9) ECLEFTV *MRI: Left entorhinal cortex volume (cubic millimeters)*
10) ECLEFTT *MRI: Left entorhinal cortex thickness (millimeters)*
11) ECRIGHTV *MRI: Right entorhinal cortex volume (cubic millimeters)*
12) ECRIGHTT *MRI: Right entorhinal cortex thickness (millimeters)*

1)	Variable Name	**JHUANONID**
	Short Description	Participant ID Anonymized by JHU
	Source	NA
	Question Text	NA
	Time of Collection	Baseline
	Data Type	Character
	Allowable Codes	JHU + 6 numbers
	Missing OK If	NA
	Audit Findings	NA
	Comments	None

2)	Variable Name	**VISITNO**
	Short Description	MRI visit number
	Source	MRI
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Integers and decimals from 1 to 10
	Missing OK If	NA
	Audit Findings	No NIH or JHU audit
	Comments	Visit when MRI was completed

3) Variable Name **MRIMOBL**

Short Description	Months from baseline
Source	DERIVED
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = 0 Max = 999
Missing OK If	NA
Audit Findings	NA
Comments	Calculated as months between the baseline start date and the recorded MRI date.

4) Variable Name **INTRACVOL**

Short Description	MRI: Intracranial volume (cubic millimeters)
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = 900,000 Max = 3,000,000
Missing OK If	NA
Audit Findings	NA
Comments	Measurement information available at: Measure obtained using FreeSurfer version 5.1. For more information, see: Miller MI, Younes L, Ratnanather JT, Brown T, Trinh H, Postell E, Lee DS, Wang M-C, Mori S, O'Brien R, Albert M, the JHU Research Team. The diffeomorphometry of temporal lobe structures in preclinical Alzheimer's disease. NeuroImage: Clinical 2013, Sep; 3:352-360. PMCID: PMC3863771.

5) Variable Name **AMYLEFTV**

Short Description	MRI: Left amygdala volume (cubic millimeters)
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = 600 Max = 2500
Missing OK If	NA
Audit Findings	NA
Comments	Measurement information available at: Measure obtained using region-of-interest large deformation diffeomorphic metric mapping (ROI-LDDMM). For more information, see: Miller MI, Younes L, Ratnanather JT, Brown T, Trinh H, Postell E, Lee DS, Wang M-C, Mori S, O'Brien R, Albert M, the JHU Research Team. The diffeomorphometry of temporal lobe structures in preclinical Alzheimer's disease. NeuroImage: Clinical 2013, Sep; 3:352-360. PMCID: PMC3863771.

6)	Variable Name	**AMYRIGHTV**
	Short Description	MRI: Right amygdala volume (cubic millimeters)
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = 600 Max = 2500
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measurement information available at: Measure obtained using region-of-interest large deformation diffeomorphic metric mapping (ROI-LDDMM). For more information, see: Miller MI, Younes L, Ratnanather JT, Brown T, Trinh H, Postell E, Lee DS, Wang M-C, Mori S, O'Brien R, Albert M, the JHU Research Team. The diffeomorphometry of temporal lobe structures in preclinical Alzheimer's disease. NeuroImage: Clinical 2013, Sep; 3:352-360. PMCID: PMC3863771.

7) Variable Name **HIPLEFTV**

Short Description	MRI: Left hippocampus volume (cubic millimeters)
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = 1800 Max = 4000
Missing OK If	NA
Audit Findings	NA
Comments	Measurement information available at: Measure obtained using region-of-interest large deformation diffeomorphic metric mapping (ROI-LDDMM). For more information, see: Miller MI, Younes L, Ratnanather JT, Brown T, Trinh H, Postell E, Lee DS, Wang M-C, Mori S, O'Brien R, Albert M, the JHU Research Team. The diffeomorphometry of temporal lobe structures in preclinical Alzheimer's disease. NeuroImage: Clinical 2013, Sep; 3:352-360. PMCID: PMC3863771.

8) Variable Name **HIPRIGHTV**

Short Description	MRI: Right hippocampus volume (cubic millimeters)
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = 1400 Max = 3600
Missing OK If	NA
Audit Findings	NA
Comments	Measurement information available at: Measure obtained using region-of-interest large deformation diffeomorphic metric mapping (ROI-LDDMM). For more information, see: Miller MI, Younes L, Ratnanather JT, Brown T, Trinh H, Postell E, Lee DS, Wang M-C, Mori S, O'Brien R, Albert M, the JHU Research Team. The diffeomorphometry of temporal lobe structures in preclinical Alzheimer's disease. NeuroImage: Clinical 2013, Sep; 3:352-360. PMCID: PMC3863771.

9) Variable Name **ECLEFTV**

Short Description	MRI: Left entorhinal cortex volume (cubic millimeters)
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = 150 Max = 950
Missing OK If	NA
Audit Findings	NA
Comments	Measurement information available at: Measure obtained using region-of-interest large deformation diffeomorphic metric mapping (ROI-LDDMM). For more information, see: Miller MI, Younes L, Ratnanather JT, Brown T, Trinh H, Postell E, Lee DS, Wang M-C, Mori S, O'Brien R, Albert M, the JHU Research Team. The diffeomorphometry of temporal lobe structures in preclinical Alzheimer's disease. NeuroImage: Clinical 2013, Sep; 3:352-360. PMCID: PMC3863771.

10) Variable Name **ECLEFTT**

Short Description	MRI: Left entorhinal cortex thickness (millimeters)
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = 1.2 Max = 3.2
Missing OK If	NA
Audit Findings	NA
Comments	Measurement information available at: Measure obtained using region-of-interest large deformation diffeomorphic metric mapping (ROI-LDDMM). For more information, see: Miller MI, Younes L, Ratnanather JT, Brown T, Trinh H, Postell E, Lee DS, Wang M-C, Mori S, O'Brien R, Albert M, the JHU Research Team. The diffeomorphometry of temporal lobe structures in preclinical Alzheimer's disease. NeuroImage: Clinical 2013, Sep; 3:352-360. PMCID: PMC3863771.

11) Variable Name **ECRIGHTV**

Short Description	MRI: Right entorhinal cortex volume (cubic millimeters)
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = 85 Max = 950
Missing OK If	NA
Audit Findings	NA
Comments	Measurement information available at: Measure obtained using region-of-interest large deformation diffeomorphic metric mapping (ROI-LDDMM). For more information, see: Miller MI, Younes L, Ratnanather JT, Brown T, Trinh H, Postell E, Lee DS, Wang M-C, Mori S, O'Brien R, Albert M, the JHU Research Team. The diffeomorphometry of temporal lobe structures in preclinical Alzheimer's disease. NeuroImage: Clinical 2013, Sep; 3:352-360. PMCID: PMC3863771.

12) Variable Name **ECRIGHTT**

Short Description	MRI: Right entorhinal cortex thickness (millimeters)
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = 1.20 Max = 3.75
Missing OK If	NA
Audit Findings	NA
Comments	Measurement information available at: Measure obtained using region-of-interest large deformation diffeomorphic metric mapping (ROI-LDDMM). For more information, see: Miller MI, Younes L, Ratnanather JT, Brown T, Trinh H, Postell E, Lee DS, Wang M-C, Mori S, O'Brien R, Albert M, the JHU Research Team. The diffeomorphometry of temporal lobe structures in preclinical Alzheimer's disease. NeuroImage: Clinical 2013, Sep; 3:352-360. PMCID: PMC3863771.