

ADNI GO
Alzheimer's Disease Neuroimaging Initiative
Grand Opportunity
3T MRI Technical Procedures Manual

Table of Contents

I.	Contact Information.....	4
II.	ADNI GO Study Overview.....	5
III.	Site Qualification.....	7
	A. Site Qualification Overview.....	8
	B. Phantom Scan Instructions.....	9
	C. Human Volunteer Scan Instructions.....	12
IV.	MRI Subject Pre-Scan Procedures.....	14
	A. Subject Pre-screening.....	15
	B. Subject Safety and Monitoring.....	15
	C. Subject Positioning.....	15
V.	MRI Subject Scan Protocol.....	18
	A. MRI Scan Information Log.....	19
	B. Entering Subject Information.....	20
	Scan #1: Tri-Planar Scout.....	20
	Scan#1a - Calibration/Reference Scan.....	21
	Scan #2: 3D MP-RAGE/IR-SPGR.....	22
	Scan #3: Accelerated 3D MP-RAGE/IR-SPGR	
	Scan #4: Axial Resting State fMRI – Philips Systems Only	
	Scan #5: Axial T2-FLAIR	
	Scan #6: Axial DTI (Diffusion Tensor Imaging) GE Systems Only	
	Scan #6: Axial ASL (Arterial Spin Label) – Siemens Systems Only	
VI.	MRI Subject Scan Procedures.....	28
	A. Scan Discontinuation.....	29
	B. Clinical Reads.....	29
	C. Archive Procedures.....	29
	D. Request for Repeat MRI Scans.....	29
VII.	On Going Quality Control and Phantom Scanning Instructions.....	31
	A. Phantom Scanning Instructions.....	32
	B. Phantom Naming.....	35
	C. Data Transfer.....	35
	D. Measurements.....	35
	E. Phantom Results and Site Notification.....	35
VIII.	Appendices	
	1. MRI Pre-Screening Form.....	38
	2. MRI Scan Information Log.....	39
	3. MRI Acquisition Summary.....	44
	4. ADNI GO Acquisition Troubleshooting Guide.....	45
	5. Frequently Asked Questions (FAQs).....	50
	6. Data Transfer to Laboratory of Neuro Imaging (LONI).....	51

I. Contact Information

- If you have any questions regarding the acquisition aspects of this protocol please contact:

adnimri@mayo.edu

- If you have any questions or problems regarding the data transfer to LONI for this protocol please contact:

adni@loni.ucla.edu

- If you have any questions regarding individual subjects please contact the study coordinator at your referral site.

II. ADNI GO 3T Study Overview

Background

MRI measurements of brain structure have been shown to demonstrate brain atrophy (which correlates with neuron loss) in MCI and AD and increasing rates of brain atrophy as subjects become more impaired. Therefore, structural MRI is used as a measure of the rate of disease progression, and possibly as a measure of treatment effect, in AD treatment trials. Major accomplishments of ADNI1 were to establish uniform methods for data collection in large multisite trials, using scanners of different vendors, comparison of 1.5 and 3 Tesla, and comparison of several different image analysis methods. Structural MRI (MP-RAGE/IRSPGR) will continue in the GO grant and the data will be used both as a measure of the rate of change as well as a predictor of future change, in EMCI and in the LMCI and NC from ADNI1. Cerebro-vascular disease (especially white matter lesions (WMLs) will be assessed with FLAIR. Recently, iron imaging especially micro bleeds (T2* GRE); has been used in anti-amyloid clinical trials, because of the association of microbleeds with anti-amyloid therapy; this will be measured with T2* GRE. Finally, there is increasing interest in ASL MRI perfusion imaging since it is thought to provide similar functional information to FDG PET. A subset of subjects will be studied with ASL.

Goals

The goal of ADNI GO is to determine the relationships among the clinical, cognitive, imaging, genetic and biochemical biomarker characteristics of the early (pre-dementia) stages of Alzheimer's disease (AD). The project builds on the NIA-currently funded AD Neuroimaging Initiative (ADNI1), a collaboration between academia and industry to study biomarkers of AD and it also serves as a bridge to the renewal of ADNI (termed ADNI2).

The specific objectives of the MRI core include: 1) Obtaining high quality multi-site data that is consistent over time, and across different MRI systems. 2) Perform appropriate image quality control throughout the study. 3) Qualify (and re-qualify after upgrades) each scanner on the GO MRI protocol. 4) Correct specific classes of image artifacts in each image acquired; imaging intensity nonuniformity, image warping due to gradient nonlinearity, and scaling changes over time. 5) Monitor each scanner longitudinally in the study using the ADNI phantom. Unlike ADNI, measurements from the phantom will not be used to modify accompanying human images. 6) Perform quantitative measurements of all images.

Study design for ADNI GO

200 newly enrolled EMCI subjects (3T) from approximately 50 sites.

3T Scanning at 4 time points -- Screen/3Month/6Month/12Month

Approximately 500 subjects will be followed from the original ADNI 1.5T study.

1.5T Scanning will take place in 12 month increments.

III. Site Qualification

A. Site Qualification Overview:

Prior to any 3T ADNI GO subjects being scanned at a particular site, that site must complete ADNI GO 3T site qualification. Site qualification includes two different exams. The first, being a scan on the specially designed ADNI phantom with the ADNI GO Phantom QC sequences loaded by your local service engineer. Secondly, your site will be asked to scan a human volunteer with the approved ADNI GO Human sequences loaded by your local service engineer. Mayo QC will review the phantom and human scans for the protocol compliance and image quality.

Please note: The same MRI scanner must be used for site qualification and ALL subsequent subject scans during the ADNI GO Study. If the same MRI scanner is not used, the scan will not be reimbursed, and the subject will need to be re-scanned on the ADNI GO qualified scanner.

QC Phantom Scan Protocol:

- 1) Localizer
 - 1a) Calibration/Reference Scan (if applicable)
- 2) QC Phantom MP-RAGE/IR-SPGR (Accelerated)
- 3) QC Phantom fMRI (Philips Systems)

Human Protocol:

*(All scans are performed in straight orthogonal planes -- Sagittal or Axial)
(No manual adjustments should be made to this protocol)*

- 1) Localizer
 - 1a) Calibration/Reference Scan (if applicable)
- 2) Sagittal MP-RAGE/IR-SPGR
- 3) Accelerated Sagittal MP-RAGE/IR-SPGR
- 4) Resting State fMRI (Philips Systems Only) - Subjects should have eyes OPEN.
- 4) Axial T2-FLAIR
- 5) Axial T2-Star
- 6) Axial ASL Perfusion (Siemens Systems Only) - Subjects should have eyes OPEN.
- 6) Axial DTI Scan (GE Systems)

After each scan protocol, please upload images to LONI (see Appendix 5) using the ADNI naming conventions detailed later in this section.

Any questions concerning site qualification scans please contact:
adnimri@mayo.edu

B. Phantom Scan Instructions:

For site qualification, each site must scan the ADNI phantom using the electronically loaded ADNI GO QC Phantom Sequences.

Note: This can be done prior to IRB approval

Please Note: Mayo QC will be supplying electronic protocols (WIPs) for installation by your local service engineer. This will ensure that you have the correct protocol for your MRI scanner. If you have any questions about this procedure please contact:

adnimri@mayo.edu

Use only the imported ADNI GO sequences.

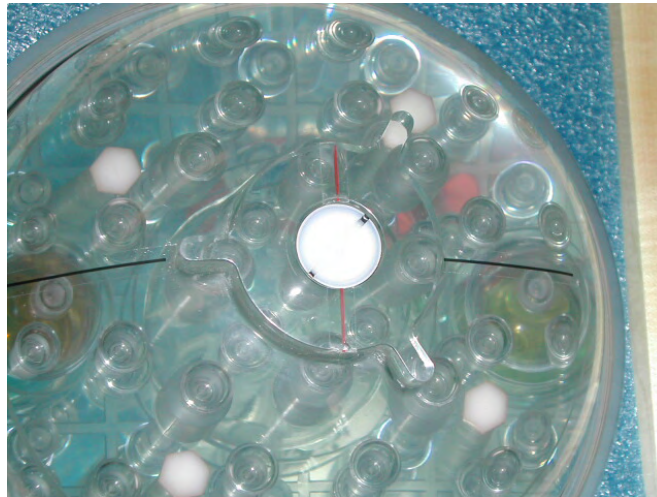
Phantom Positioning:

The following image shows the phantom placed in the appropriate position within the 8-channel coil. Achieving a reproducible position is a key element to the system performance analysis that will be conducted each day an ADNI GO subject(s) are imaged. The phantom should be placed in the coil with the alignment markers facing upward and the serial number SN XXXX positioned out of the bore as shown, along with alignment guides, will facilitate the reproducible positioning of your phantom.



ADNI phantom shown positioned inside of an 8-channel head coil.

Please note that your phantom has a base and positioning markers (in black and red, see image below). The phantom should be placed inside the head coil with the indicated “top” facing upwards. This orientation is due to space constraints within some coils and we would like to maintain a consistent orientation for all scanners across the ADNI GO study. Please inspect the phantom and note the additional marks added to help you position your phantom. We have indicated the top of the phantom with red and black marks to aid with placement in the coil.



The top of the phantom and the alignment lines are indicated above. These markings should be used with the alignment lights on your scanner to position the phantom.

Please place the phantom in your head coil with the alignment marks facing up, and the phantom SN number (e.g. 9996) facing you, out of the bore (see the following picture). Furthermore, try to align the center of the phantom with the center of the coil. Use the alignment lights on your scanner to position the phantom into the center of the magnet.



The phantom is shown in the correct position, with the Serial Number (SN 9999) positioned forward and reading correctly from right to left. This will be the typical scanning position for your phantom

Phantom Scan Protocol:

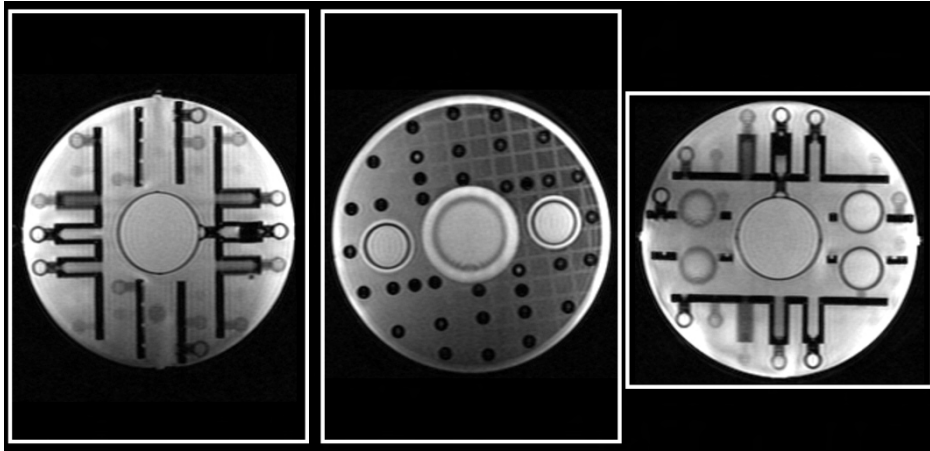
Scan the phantom using the entire electronically loaded ADNI GO QC Phantom protocol.

Phantom Scan Protocol:

- 1) Localizer
 - 1a) Calibration/Reference Scan (if applicable))
- 2) QC Phantom MP-RAGE/IR-SPGR (Accelerated)
- 3) QC Phantom fMRI (Philips Systems)

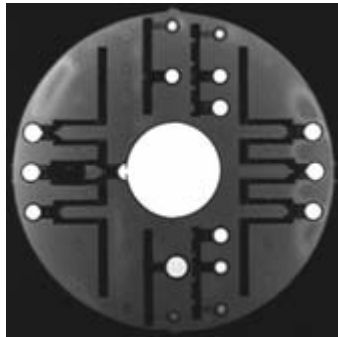
1. Localizer

3 Plane Localizer.



Example – Place FOV to cover entire phantom.

2. QC Phantom MP-RAGE/IR-SPGR (Accelerated)



Example

3. QC Phantom fMRI (Philips Systems)
(image forthcoming)

Data Transfer:

Please upload all the sequences acquired for the phantom scan to the LONI website as detailed in Appendix 5.

Phantom Naming:

1. **ADNI Phantom Naming Convention (*entered during LONI upload*):**

For the upload to LONI, phantom scans should follow the naming convention:

XXX_P_YYYY

X=Site#/P=Phantom/Y=Phantom#

For example, each phantom scan from site 007 should be coded:

007_P_9999

2. **De-identification**

As part of the upload process to LONI, all the information entered into the scanner will be removed and replaced with the information entered during the LONI upload procedure. For this reason, you are encouraged to enter the phantom scan information into the scanner following standard local practice.

Phantom Scan Results:

Mayo QC will examine the phantom data and determine if the correct parameters have been met and assure there are no other underlying problems with the scanning session. When finished, an email will be sent to your site notifying you of the results.

C. Human Volunteer Scan Instructions

1. ***After*** your site has received institutional IRB approval for the ADNI GO protocol, A human volunteer must be scanned using the ADNI GO electronically loaded protocol at 3T.
2. The volunteer should be consented by the study coordinator.
3. Since the data will be de-identified during the upload process to LONI, please enter the volunteer's information into the scanner following standard local practice.
4. Please scan the volunteer using the instructions outlined in "MRI Pre-Scan Procedures" addressed on page 15 of this manual. It is crucial to follow the appropriate pre-scan procedures, subject positioning guidelines, and ADNI GO sequences.

Human Scan Protocol:

*(All scans are performed in straight orthogonal planes -- Sagittal or Axial)
(No manual adjustments should be made to this protocol)*

- 1) Localizer
 - 1a) Calibration/Reference Scan (if applicable)
- 2) Sagittal MP-RAGE/IR-SPGR
- 3) Accelerated Sagittal MP-RAGE/IR-SPGR
- 4) Resting State fMRI (Philips Systems Only) - Subjects should have eyes OPEN.
- 4) Axial T2-FLAIR
- 5) Axial T2-Star
- 6) Axial ASL Perfusion (Siemens Systems Only)
- 6) Axial DTI Scan (GE Systems)

Data Transfer:

Please upload all the sequences acquired for the volunteer scan to the LONI website as detailed in Appendix 5.

Volunteer Naming:**1. ADNI Volunteer Naming Convention: (entered during LONI upload):**

Volunteer scans should follow the naming convention:
XXX_V_1000 (X=Site#/V=Volunteer#/Y=Vol#)

For example, each phantom scan from site 007 should be coded:

007_V_1000

2. **De-identification** - As part of the upload process to LONI, all the information entered into the scanner will be removed and replaced with the information entered during the LONI upload procedure. For this reason, you are encouraged to enter the volunteer scan information into the scanner following standard local practice.

Human Volunteer Scan Results:

The Mayo QC team will perform a quality control check on the volunteer scan data. Mayo QC will determine if the correct parameters have been met and assure there are no other underlying problems seen during the scanning of this session. When finished, an email will be sent to your site notifying you of the results. In addition, an e-mail will be sent to the selected contact list for your site notifying them your site has been approved and is ready to scan subjects.

Anticipation of Hardware Upgrades:

The Mayo QC team requires notification prior to any software and/or hardware upgrades for any scanner involved in the ADNI imaging study.

ADNIMRI@Mayo.edu

Depending on the impact of the upgrade the site may be required to scan a phantom and/or volunteer prior to continued scanning.

IV. MRI Subject Pre-Scan Procedures

A. Subject Pre-screening

1. All subjects should have been screened by the study coordinator for standard MRI contraindications. (A copy of the pre-screen form is available in Appendix 1) However, subjects must be screened for MRI contraindications immediately before the MRI scan using your local standard protocol. Contraindications include, but are not limited to:
 - The presence of non-removable ferrous metal objects
 - Aneurysm clips
 - Pacemakers
 - Other contraindications such as defibrillators, etc.
2. Sedation is not offered for this protocol. Subjects that are uncomfortable with MRI scans should not be included in this study. If you have a subject who is uncomfortable with MRI and refuses to complete the scan without sedation, please contact the referring center and notify the study coordinator.

B. Subject Safety and Monitoring

1. All sites should follow the standard subject consent protocols as approved by your local IRB. Explain the scan procedure to the subject so that they know what to expect during the MRI.
2. Provide the subject with the opportunity to use the restroom before the scan begins.
3. Please use universal MRI safety precautions. Make sure that subject does not have any large ferrous metal on or inside of him/her such as shrapnel, a metal fragment in the eye, aneurysm clips, ear implants, spinal nerve stimulators, permanent makeup, or a pacemaker. Make sure that all loose metal objects are removed (Please refer to Appendix 1 Pre-Screening Form).
4. Please use standard local practice for monitoring the subject during the scan. These may include devices to monitor pulse and O₂ levels.

C. Subject Positioning

1. Proper subject positioning is crucial for successful reproduction of serial MRI exams. Therefore, it is important that each subject is positioned in the same manner for each and every MRI exam.
2. Please follow the procedures below for positioning the subject in the head coil:
 - Place clean sheet on scanner table and coil cradle.
 - Besides standard room exclusions ensure the subject has removed their dentures as well as any hair clips, combs, earrings, necklaces, etc.

- Remove all upper body clothing with metallic trim, such as zippers, buttons or embroideries that may cause artifacts in the MRI images.
- **Tape stereotactic marker (vitamin E or fish oil capsule) on the subjects' right temple (RT).**



- Provide each subject with ear protection.
- Position the subject so their head and neck are relaxed, but without rotation in either plane. Proper placement in the head coil is crucial because scans are acquired straight, not in an oblique orientation. The subject should also be well supported in the head coil to minimize movement. Motion artifacts may result in data rejection and request for a re-scan in many cases.
- Support under the back and/or legs can help to decrease strain on the knees and back as well as assisting in the stabilization of motion in the lower body.
- Once subject has been positioned, place sponges along the sides of head and a Velcro strap across forehead (if available) for stabilizing support and reduction of motion.

- **Align the centering crosshairs on the subject's nasion (*directly between the eyebrows*) at every scanning session.**

Please Note:

- It is extremely important that the subject is positioned in the same manner, at the nasion, for the Baseline MRI exam and for all the subsequent MRI visits.
- It is imperative that the subject positioning procedures are followed exactly for all follow-up exams for a particular subject to ensure consistent imaging of the brain.
- If a deviation from these instructions is required to accommodate a subject, the MRI technologist must note this on the MRI Scan Form and refer to these notes during the follow-up exam.

- Center the head coil over the subject's head, making sure the subject is high enough in the coil to prevent signal loss at the inferior aspect of the brain.
- Offer each subject a panic button in case of emergencies or claustrophobia if common local practice at your facility (for example, a squeeze ball alarm.)
- Remind subject to hold as still as possible and advance subject to the iso-center of the scanning bore.

V. MRI Subject Scan Protocol

ADNI Subject Scanning Session Includes:

- 1) Localizer
 - 1a) Calibration/Reference Scan (if applicable)
- 2) Sagittal MPRAGE/IR-SPGR
- 3) Accelerated Sagittal MP-RAGE/IR-SPGR
- 4) Resting State fMRI (Philips Systems Only) - Subjects should have eyes OPEN.
- 4) Axial T2-FLAIR
- 5) Axial T2-Star
- 6) Axial ASL Perfusion (Siemens Systems Only)
- 6) Axial DTI Scan (GE Systems)

Then following the subject scan, please scan the ADNI Phantom as a new exam:

- Localizer Scan (20 secs)
- QC Phantom MPRAGE (Accelerated) (5-8 mins)

The Mayo QC team will check all imaging parameters to assure the correct sequence was used. If the electronically loaded ADNI GO sequence is not used to scan a subject, the scan will be excluded and the subject must be re-scanned with the correct ADNI sequences.

A. MRI Scan Information Log

1. The “MRI Scan Information Form” should be completed at the time of acquisition for every ADNI GO subject. A copy of the MRI worksheet is included in Appendix 2.
2. The study coordinator at the referral site should complete the top section of the MRI Scan Worksheet. If this section is incomplete, please contact the study coordinator for the information.
3. The MRI technologist should complete the remainder of the form during the scan. Please be sure to indicate if each sequence has been completed and note any problems or modifications to the protocol in the appropriate sections. Also, note if data transfer, archive, and local copy for clinical reads have been completed.
4. Please complete the form in full and transfer to the study coordinator at the referral site. The study coordinator will upload the information into the ADNI GO database and this will be linked with the subjects’ MRI data. Please keep a copy on site for your records.
5. To report an incident regarding the MRI sequences please email:
ADNIMRI@mayo.edu
6. To report an incident about a specific subject please contact your study coordinator.

B. Entering Subject Information

1. Please enter the subject's information into the scanner following your standard local practice. This will assure the scan is formatted for your local archival system. When data are uploaded to LONI the scan header will be de-identified and rendered HIPAA compliant. Data will be identified at the LONI site by subject code only. The subject code will be entered manually at the time of data transmission to LONI.

C. Scanning Sequences:

#1: 3 Plane Localizer:

1. A quick acquisition in 3 orthogonal planes for anatomical orientation. Multiple slices acquired in the middle of each plane (sagittal, coronal, transverse). The head should be centered laterally along the inter-hemispheric fissure and centered on the thalamus for the anterior/posterior and superior/inferior planes. Please use the images below as reference when determining if the subject is positioned properly.
2. Proper placement in the head coil is crucial because scans are acquired in straight orthogonal planes. (Oblique scans are not allowed).
3. If the subject is not positioned properly please adjust the subject in the head coil and re-scout. Continue repositioning and scouting until the subject is correctly centered in the head coil.

Example:



Box A – Axial image. FOV placed in center to avoid side-to-side wrap.

Box B – Sagittal image. FOV placed anterior to avoid nose wrap.

Box C – Coronal image. FOV placed to assure top of the brain is covered.

Make sure subject is aligned correctly in the head coil and is not rotated. Their head should be as straight as possible in the coil. Please adjust the subject if necessary.



The head should be centered laterally along the inter-hemispheric fissure.

Proper placement in the head coil is crucial because scans are acquired straight, not in an oblique orientation.

Please Note:

- It is mandatory that the ADNI GO acquisition protocols electronically imported to your MRI be used for all sequences at the Baseline MRI exam and for all the subsequent MRI visits unless otherwise directed by the coordinating center.
- Failure to use the same sequence at the time of Baseline and all subsequent visits will result in the request for a rescan of the subject.
- It is mandatory that the ADNI GO qualified scanner be used for all subjects in the ADNI GO study.
- Failure to use the ADNI GO qualified scanner for all subjects in the ADNI GO Study will result in the request for a rescan of the subject.

#1a: Calibration/Reference Scan (If applicable)

MRI scanners provide automated adjustment procedures Calibration/RF coil tuning and frequency adjustments after the subject is positioned in the magnet. Follow the adjustment procedures provided by your manufacturer.

#2: 3D MP-RAGE/IR-SPGR

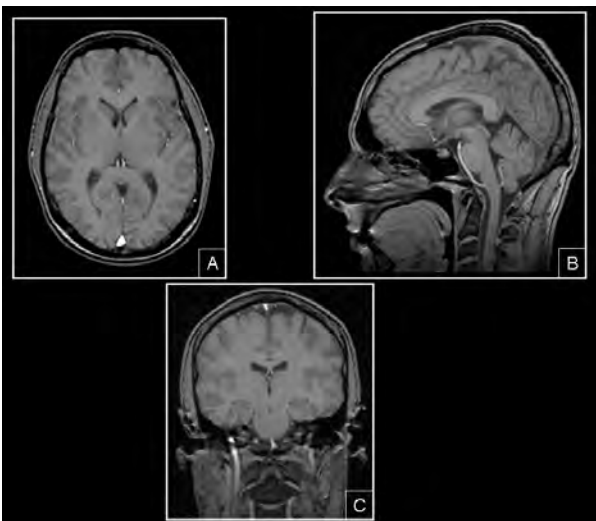
MP-RAGE = Siemens/Philips – IR-SPGR=GE

Example:



1. Orientation. **Straight** sagittal. Slices will be prescribed from left to right. **DO NOT** oblique the scanning FOV to compensate for subject held tilt.
2. Positioning:
Use the tri-planar scout to position the acquisition box. Make sure to get full head coverage. **Studies that do not contain the whole brain and skull cannot be processed.** The skull must be fully included superiorly and laterally. The entire cerebellum should be included inferiorly. **In the anterior/posterior plane the nose should also be included otherwise image folding into the back of the brain will result and the exam may not be usable for the study.** Please see the images below and use as a guide to correctly position the acquisition box.

Example of 3 Plane Localizer for MP-RAGE FOV Placements



A – Axial image. FOV placed in center to avoid side-to-side wrap.

B – Sagittal image. FOV placed anterior to avoid nose wrap.

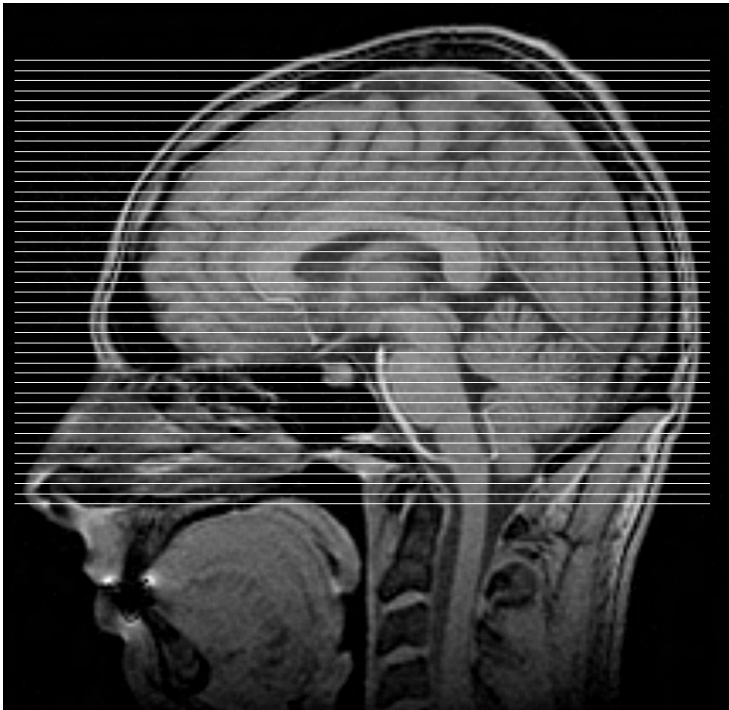
C – Coronal image. FOV placed to assure top of the brain is covered.

#3: Accelerated 3D MP-RAGE/IR-SPGR

For every ADNI GO 3T exam, the sagittal MP-RAGE/IR-SPGR sequence is acquired a second time with an acceleration factor. Unless indicated, the scan prescription should be identical as the un-accelerated scan.

Positioning for all Axial Scans:

1. Orientation: **Straight** Axial. Prescribe slices inferior to superior. **DO NOT** Oblique Scans.
2. Positioning: Position on mid-sagittal slice from tri-planar scout. Make sure to get full BRAIN coverage whenever possible. The acquisition stack should be placed just above the most superior point in the brain and should fully cover the cerebellum as well as all brain in the lateral and the anterior to posterior planes. If extra transverse slices are required to achieve this coverage please acquire those slices.

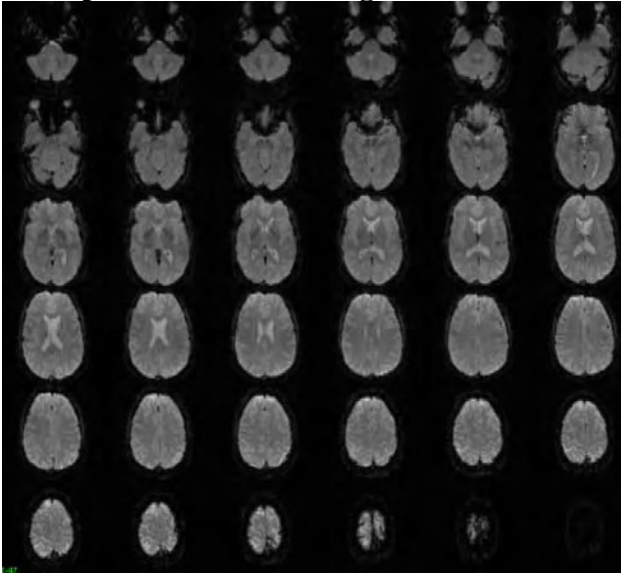


** **DO NOT** oblique the scanning slices to compensate for subject held tilt. Scan as straight Axials.

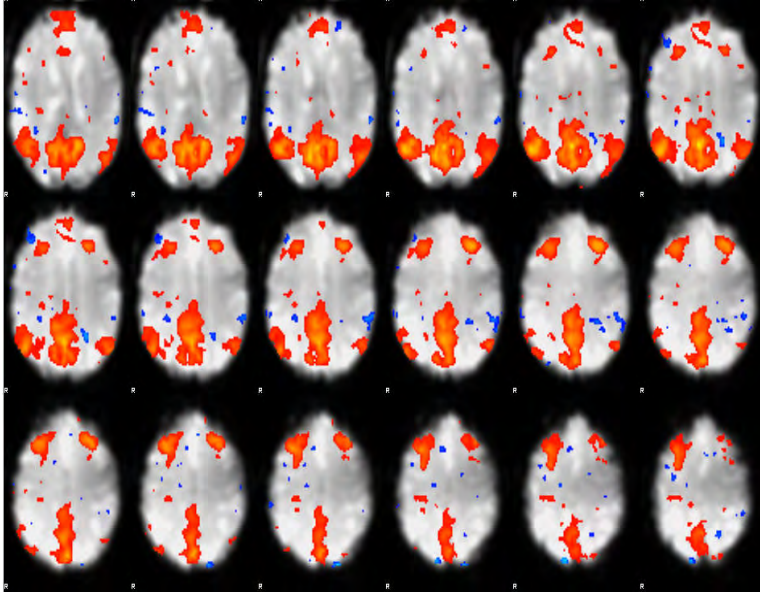
#4: Axial Resting State fMRI – Philips Systems Only

(Subject should have eyes OPEN)

Example: Raw fMRI Images



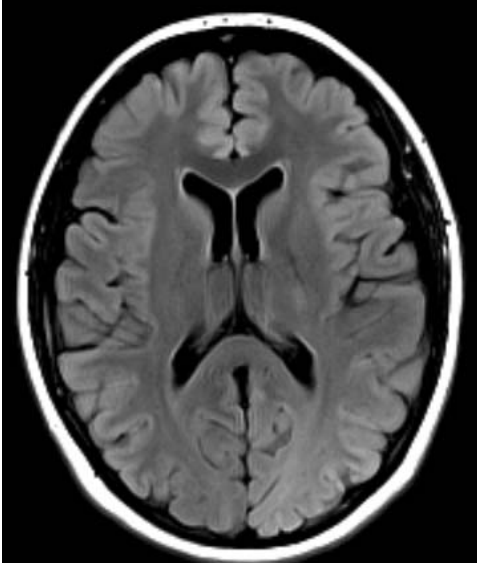
Example: Resting State Default Network (Post Processed Image)



1. Orientation: Straight Axial -- DO NOT Oblique Scans.
2. Subject Instruction: **Please instruct the subject to keep their eyes open during the entire scan.** You can instruct them to focus on a point on the mirror or scanner. Also remind the subjects of the importance of holding their head still for the entire scan.
3. Positioning: Position on mid-sagittal slice from tri-planar scout. **The acquisition stack should be placed just above the most superior point in the brain and should cover the cerebellum if possible.**

#4: Axial T2-FLAIR

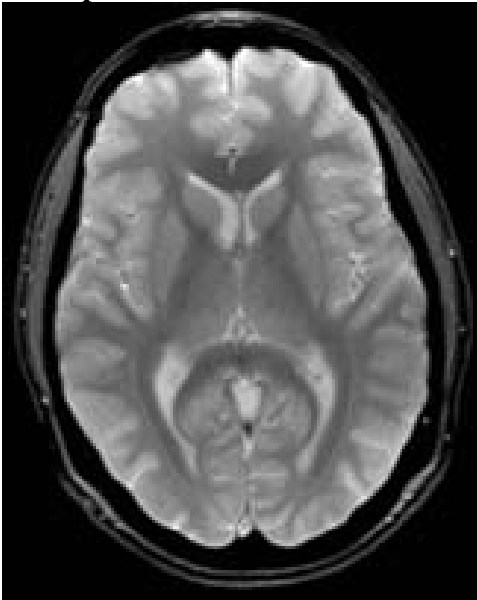
Example:



Orientation: Straight Axial. Prescribe slices inferior to superior. ** DO NOT oblique the scanning slices to compensate for subject held tilt. Scan as straight Axials. If extra transverse slices are required to achieve this coverage please acquire those slices.

#5: Axial T2-Star

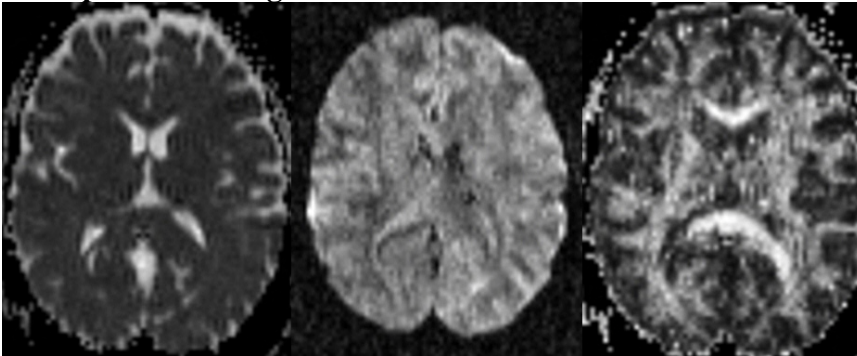
Example:



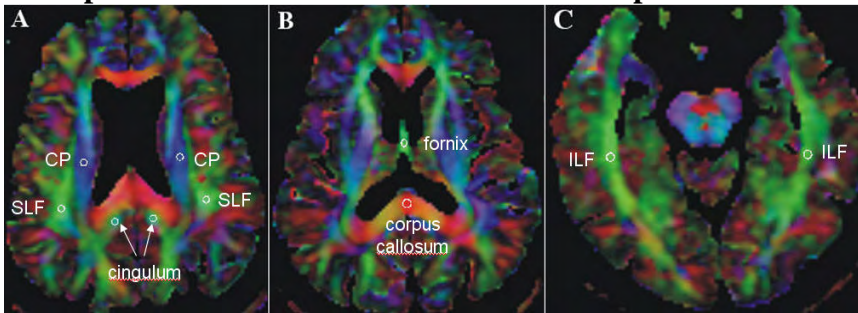
Orientation: Straight Axial. Prescribe slices inferior to superior. ** DO NOT oblique the scanning slices to compensate for subject held tilt. Scan as straight Axials. If extra transverse slices are required to achieve this coverage please acquire those slices.

#6: Axial DTI (Diffusion Tensor Imaging) – GE Systems Only

Example: Raw Images



Example: Post Processed Color Coded FA Maps



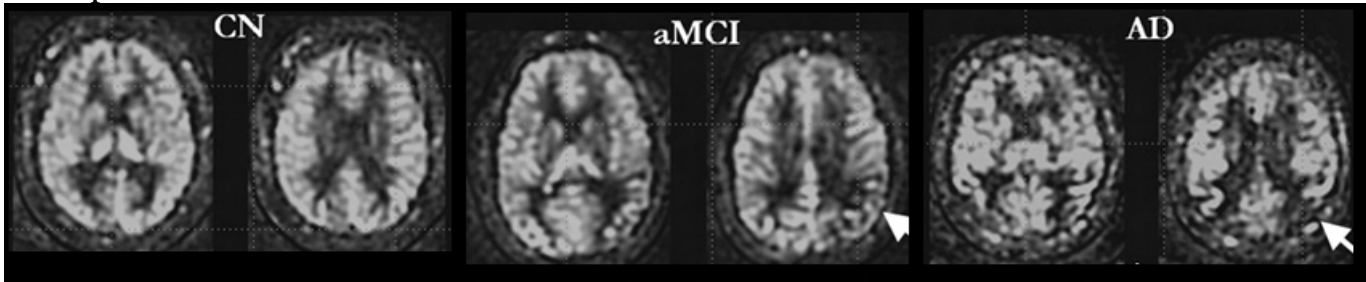
From Kantarci et al, submitted

Orientation: Straight Axial. Prescribe the 3D Slab inferior to superior. **** DO NOT** oblique the slab to compensate for subject held tilt. Scan as straight axial.



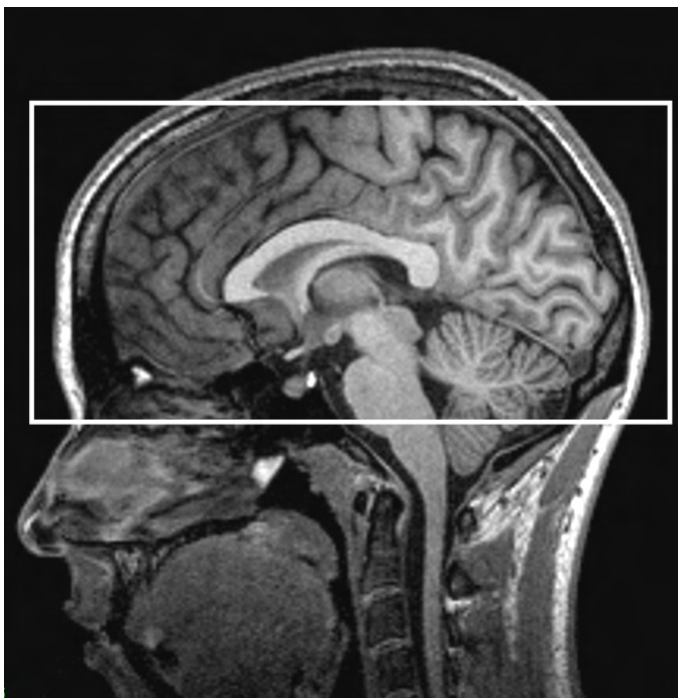
#6: Axial ASL (Arterial Spin Label) – Siemens Systems Only -- Subjects should have eyes OPEN.

Example:



From Vemuri et al, submitted

Orientation: Straight Axial. Prescribe the 3D Slab inferior to superior. **** DO NOT oblique the slab to compensate for subject held tilt. Scan as straight axial.**



VI. MRI Subject Scan Procedures

A. Scan Discontinuation

1. If the subject elects to discontinue the MRI because of discomfort every effort should be made to adjust the table, head coil, etc. and finish acquiring the scan. However, if the subject still does not want to complete the scan, then the MRI should be abandoned and noted as incomplete on the ADNI GO 3T MRI Scan Worksheet. The comments sections should include the reason the subject was unable to complete the MRI.

B. Clinical Reads

1. **Every subject in the ADNI GO Study *must* receive a clinical read by an on-site radiologist at each MRI facility.** The clinical read should follow standard local practice and a clinical dictation of the read should be transferred to the study coordinator at the referral site.
2. Clinical reads will **not** be provided by Mayo QC or LONI.

C. Archive Procedures

1. Every MRI (both human and phantom) for the ADNI GO Study *must* be archived at the MRI facility following standard local practice in addition to the data transfer to LONI immediately after the MRI scan. Additional data transfers or copies will be requested by the coordinating center in the event that a data transfer is interrupted or incomplete. Possible MRI archive mediums include:
 - Optical Disk
 - PACS
 - CD or DVD

D. Request for Repeat MRI Scans

1. Reasons for MRI Repeats:
 - a. A request for a repeat MRI may be required in the event that the scans are found to be unacceptable due to subject motion or an incomplete MRI acquisition. Your site will be asked to schedule a repeat study.
 - b. Mayo QC will check all ADNI GO scans for protocol compliance. Repeat exams may also be required if the incorrect scan sequence, orientation, or angulations are used. It is imperative to use the ADNI GO approved acquisition sequence with every ADNI GO subject. Scans with image degradation due to the incorrect scan sequence, orientation, or angulations will **NOT** be reimbursed. Re-scans will be reimbursed if the correct scan sequence, orientation, and angulations were used.

2. Procedures for MRI Repeats:
 - a. Repeat MRI scans should be performed as quickly as possible. The coordinating center for the ADNI GO Study will contact the referral site as well as the MRI facility requesting a repeat MRI. Detailed information regarding the reason for the repeat as well as suggestions for improvement will be communicated to both sites.

VII. On Going Quality Control and Post-Subject Phantom Scanning Instructions

To ensure scanner stability and scan quality throughout the ADNI GO Study, each site is **required** to perform *on going* quality control scans on the ADNI phantom using the ADNI GO QC Phantom protocol each day a subject is scanned. If multiple subjects are scanned on a single day, only one phantom scan needs to be acquired

IMPORTANT: If a site fails to perform these phantom scans and they have not been performed within 24 hours, ADNI will not reimburse the subject scan until received.

A. On Going Quality Control (QC) Phantom Scanning Instructions

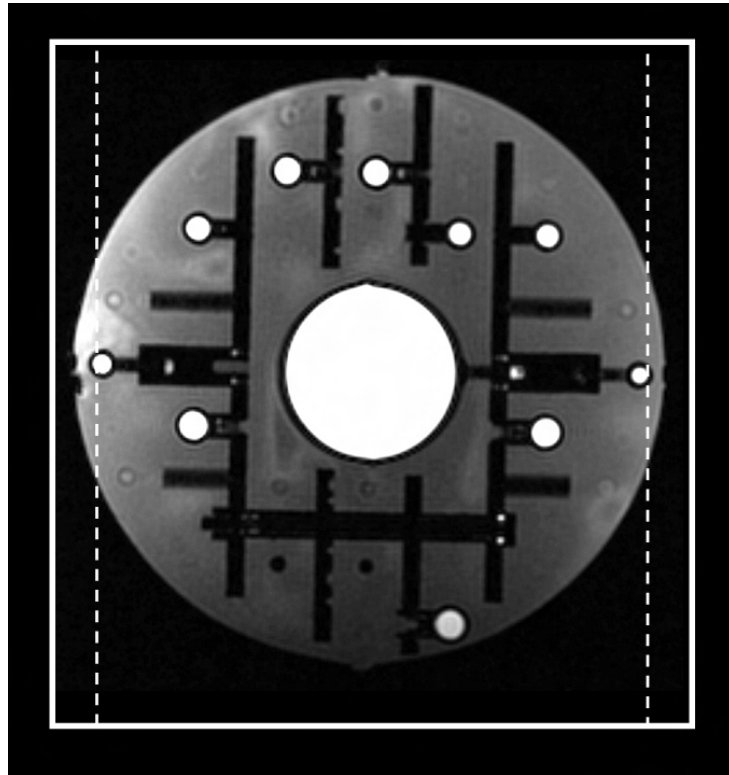
For on-going quality control and post processing image analysis, each site must scan the specially designed ADNI phantom using the electronically loaded ADNI QC protocols **each day a subject is scanned.**

On Going QC Phantom Scan Protocol:

Phantom Scan Protocol:

- 1) Localizer
 - 1a) Calibration/Reference Scan (if applicable))
- 2) QC Phantom MP-RAGE/IR-SPGR (Accelerated)
- 3) QC Phantom fMRI (Philips Systems)

1. On the day a subject(s) scan(s) is completed, register the phantom as a new exam. (Start a new exam)
2. **3 Plane Localizer** - Please run a localizer to be sure the phantom is positioned correctly in the head coil.
3. **QC Phantom Sagittal MP-RAGE/IR-SPGR** - The on-going quality control scans are identical to the subject 3D scans except the slice thickness has been increase to ensure that the phantom has been covered completely. Please refer to the following figure.



Note that the dotted line shows original slice thickness of 1.2 and solid line represents thickness of 1.3, which is adequate for covering entire phantom.

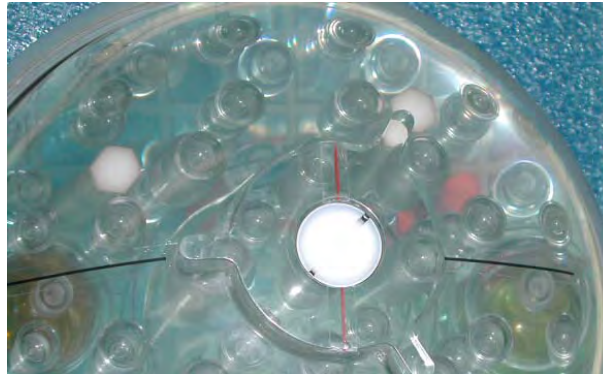
Phantom Positioning:

The following image shows the phantom placed in the appropriate position within the 8-channel coil. Achieving a reproducible position is a key element to the system performance analysis that will be conducted each day an ADNI GO subject(s) is imaged. Positioning with the alignment lines upward and the serial number SN XXXX positioned out of the bore as shown, will facilitate the reproducible positioning of your phantom.



ADNI phantom shown positioned inside of an 8-channel head coil.

Please note that your phantom has a base and positioning markers (in black and red, see image below). The phantom should be placed inside the head coil with the alignment markers facing upwards. This orientation is due to space constraints within some coils and we would like to maintain a consistent orientation for all scanners across the ADNI study.



The top of the phantom and the alignment lines are indicated above. These markings should be used with the alignment lights on your scanner to position the phantom.

Please place the phantom in your head coil with the alignment markers up, and the phantom SN number (e.g. 9999) facing you, out of the bore (see the following picture). Furthermore, try to align the center of the phantom with the center of the coil. Use the alignment lights on your scanner to position the phantom into the center of the magnet.



The phantom is shown in the correct position, with the Serial Number (SN 9999) positioned forward and reading correctly from right to left. This will be the typical scanning position for your phantom

Phantom Storage:

Due to its small base, please store your phantom in the wooden box that it came in. This will ensure that the phantom does not roll off its base and fall when it is not being used.



Phantom Naming:

1. ADNI Phantom Naming Convention (*entered during LONI upload*):

For the upload to LONI, phantom scans should follow the naming convention:

XXX_P_YYYY

X=Site#/P=Phantom/Y=Phantom#

For example, each phantom scan from site 007 should be coded:

007_P_9999

- 2. De-identification** - As part of the upload process to LONI, all the information entered into the scanner will be removed and replaced with the information entered during the LONI upload procedure. For this reason, you are encouraged to enter the phantom scan information into the scanner following standard local practice.

Data Transfer:

Each site will send the phantom data (along with the subject data) to LONI within 24 hours after the completion of the scan as detailed in Appendix 5.

Measurements:

The Mayo QC team will perform the following measurements on the phantom data: Gradient Linearity Measurements, Signal to Noise measurements, Image contrast, Inhomogeneity, and RF Power measurements.

Phantom Results and Site Notification:

Mayo QC will examine each phantom data set to ensure that there are no underlying problems with the scanning session, and that the scanner has not drifted out of specification. When finished, if there is an issue that needs to be addressed, an email will be sent to your site notifying you of the problem.

VIII. Appendices

Appendix 1: MRI Pre-Screening Form

The following is an example of the form subjects complete with the study coordinator prior to their MRI scans. The study coordinator should notify the MRI site if the subject has indicated yes for any items that may pose a risk to the subject (i.e. internal metal) during the MRI. This form should not be a substitute for your standard pre-screening form.

Date ____/____/____

Subject ID _____

Please check Yes/No for each of the following:

Yes No Previous MRI scan

Exclusionary Items:

- Yes No Cardiac pacemaker / defibrillator
- Yes No Aneurysm or aortic clip(s)
- Yes No Neurostimulator
- Yes No Cochlear, otologic, or ear implant

Please Inform MRI Center:

- Yes No Prosthesis or implant
- Yes No Artificial limb or joint
- Yes No Insulin or infusion pump
- Yes No Bone growth / fusion stimulator
- Yes No Carotid artery vascular clamp
- Yes No Electrodes (on body, head, or brain)
- Yes No Stents, filters, or coils (intravascular)
- Yes No Shunt (spinal or intraventricular)
- Yes No Vascular access port and / or catheter
- Yes No Tattooed makeup (eyeliner, lips, etc.)
- Yes No Body piercing(s)
- Yes No Any metal fragments or shrapnel (current or removed)
- Yes No Internal pacing wires
- Yes No Metal or wire mesh implants
- Yes No Bone / joint pin, screw nail, wire, plate
- Yes No Breathing disorder
- Yes No Claustrophobia
- Yes No Hearing aid (*Remove before MRI*)
- Yes No Dentures (*Remove before MRI*)

If answers below are yes, please explain below

- Yes No Worked extensively with metal (grinding, etc.)
- Yes No A history of seizures continuing to present

Explanation _____

Signature of subject or subject's representative

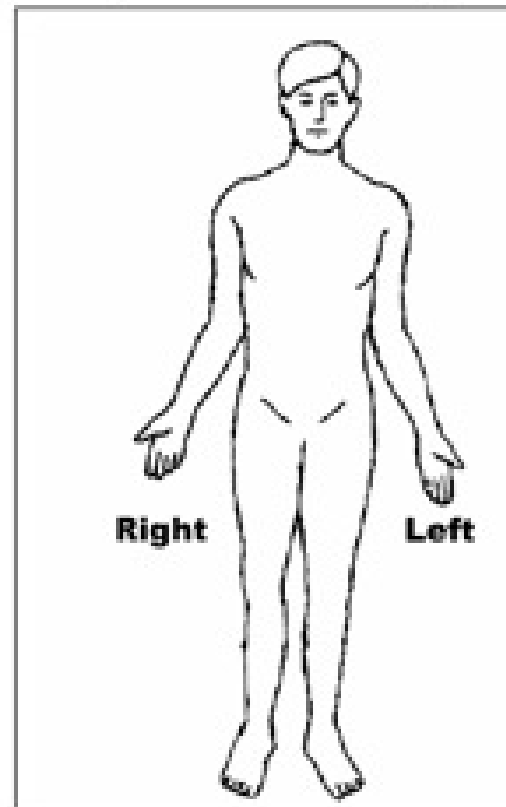
Name of Representative

Signature of person administering screening form

Date ____/____/____

Date ____/____/____

Please mark on the figure below the location of implant or metal inside or on your body



Remove all metallic objects prior to your examination

Appendix 2: MRI Scan Information Log

- The “MRI Scan Information Log” should be completed at the time of acquisition for every ADNI GO subject. A copy of the 3T MRI worksheet follows.
- The study coordinator at the referral site should complete the top section of the form. If this section is incomplete, please contact the study coordinator for the information.
- The MRI technologist should complete the remainder of the form during the scan. Please be sure to indicate if each sequence has been completed and note any problems or modifications to the protocol in the appropriate sections. Also, note if data transfer, archive, and local copy for clinical reads have also been completed.
- Please complete the form in full and transfer to the study coordinator at the referral site. Please keep a copy on site for your records.

ADNI GO – 3T MRI - Scan information sheet.

Participant:

		/ /
--	--	-----

Participant ID

Session ID

Date of Scan

Visit: *Baseline*

Site Code:

Study Coordinator Name:

ADNI GO Participant Initials:

MRI Technologist Initials:

****Important:** It is mandatory that the ADNI GO site qualified scanner be used for ALL participants in the ADNI GO study. ****It is also mandatory that the same ADNI GO approved sequences are used for all ADNI GO subject scans. Do NOT adjust protocol values.**

Was the scan conducted?

Yes

No

Reason why the scan was not conducted:

Illness

Participant unavailable

Participant unwilling

Administrative problems

Withdrawn consent

Other (specify)

If Other, specify:

Placed Marker on the subjects Right (RT) temple.

Yes No

Scan #1: 3 Plane/Tri-Planar Scout: **Check the subject positioning in the head coil; Re-position and re-scout if necessary.

Completed?

Yes

No

NOTES:

Scan #2: Sagittal 3D MP-RAGE/IR-SPGR: ** Straight sagittal. **DO NOT** oblique the scanning FOV to compensate for subject held tilt. Position FOV to avoid nose wrapping into the back of the brain.

Completed?

Yes

No

NOTES:

Scan #3: Sagittal 3D Accelerated MP-RAGE/IR-SPGR: Please scan in the exact same position as the non-accelerated scan unless repositioning is necessary

Completed?

Yes

No

NOTES:

Scan #4: Axial Resting State fMRI (*Subject should have eyes OPEN*):

--Philips Systems Only

The acquisition stack should be placed just above the most superior point in the brain and should cover inferior as much as possible, if the cerebellum is not covered fully, that is acceptable. Instruct the subject prior to this scan that they should have their eyes open and to hold very still. **DO NOT oblique the scanning slices.

Was the subject instructed to open their eyes?

Yes

No

Did the subject keep their eyes open? (MRI Tech: ask the subject right after the scan)

Yes

No

Completed?

Yes

No

NOTES:

Scan #5: Axial T2 Star: Position Slices to cover below cerebellum through the top of the head. **DO NOT** oblique the scanning slices.

Completed?

Yes

No

NOTES:

Scan #6: Axial ASL Perfusion Scan (*Subject should have eyes OPEN*):

-- Siemens Systems Only (with license agreement):

Position Slices to cover below cerebellum through the top of the head. **DO NOT** oblique the scanning slices.

Was the subject instructed to open their eyes?

Yes

No

Did the subject keep their eyes open? (MRI Tech: ask the subject right after the scan)

Yes

No

Completed?

Yes

No

NOTES:

Scan #6: Axial DTI Scan

-- GE Systems Only (with license agreement):

Position Slices to cover below cerebellum through the top of the head. **DO NOT** oblique the scanning slices.

Completed?

Yes

No

NOTES:

Patient Motion Problems:

Yes

No

If yes, describe:

Scanner malfunction:

Yes

No

If yes, describe:

Other protocol variations:

Yes

No

If yes, describe:

Was data transferred to LONI within 24 hours of scan?

Yes

No

Transfer Date:

Month/Day/Year

Comments

Data Archived Locally?

If No, please explain under comments.

Yes

No

Archive Medium (circle): PACS

CD/DVD MOD

Other:

Comments

Was a lumbar puncture completed prior to the MRI scan? (Completed by the study coordinator)

Yes

No

If Yes, What was the interval between LP and MRI? less than 6 hours 13-24 hours 49-72 hours
6-12 hours 25-48 hours more than 72 hours

Appendix 3: MRI Acquisition Summary

Please Note: Your MRI scanner vendor (GE, Siemens, or Phillips) will be supplying electronic protocols (WIPs) for installation to your local service engineer for your specific MRI system(s). This will ensure that you have the correct protocol for your MRI scanner. If you have any questions about this procedure please contact: ADNIMRI@Mayo.edu

Use only the imported ADNI sequences

Additional electronic copies of the ADNI sequences can be found at:
<http://www.loni.ucla.edu/ADNI/Research/Cores/>

ADNI GO 3T QC Phantom Scan Protocol:

- 1) Localizer
 - 1a) Calibration/Reference Scan (if applicable)
- 2) QC Phantom MP-RAGE/IR-SPGR (Accelerated)
- 3) QC Phantom fMRI (Philips Systems)

ADNI GO 3T Human Protocol:

(All scans are performed in straight orthogonal planes -- Sagittal or Axial)
(No manual adjustments should be made to this protocol)

- 1) Localizer
 - 1a) Calibration/Reference Scan (if applicable)
- 2) Sagittal MP-RAGE/IR-SPGR
- 3) Accelerated Sagittal MP-RAGE/IR-SPGR
- 4) Resting State fMRI (Philips Systems Only)-Subjects should have eyes OPEN.
- 4) Axial T2-FLAIR
- 5) Axial T2-Star
- 6) Axial ASL Perfusion (Siemens Systems) - Subjects should have eyes OPEN.
- 6) Axial DTI Scan (GE Systems)

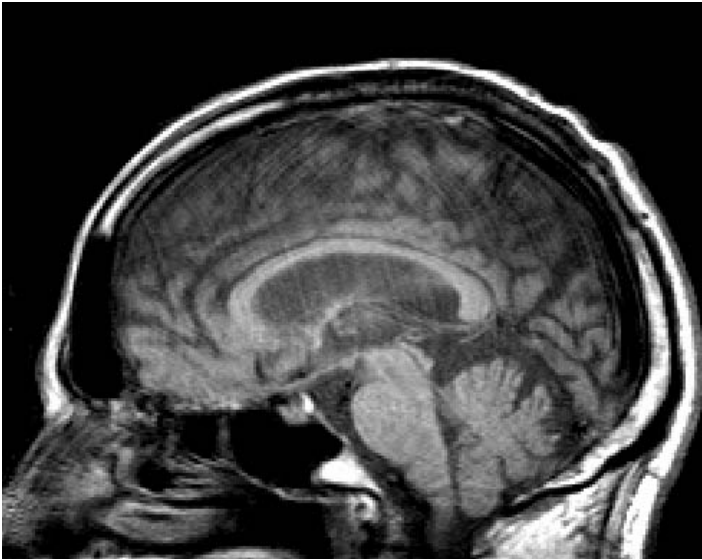
Appendix 4: ADNI Acquisition Troubleshooting Guide

Superior image quality is imperative to the success of the ADNI GO Study. Every effort should be made to acquire excellent scans on ADNI GO subjects at their first MRI appointment and at all subsequent visits. This prevents the clinical centers from rescheduling additional repeat MRI's for subjects.

It should also be noted that the 3D T1 acquisition sequence is the most important sequence in the ADNI GO. This sequence should always be acquired immediately after the tri-planar scout. Please note the image quality of this scan and re-acquire if necessary before running the rest of the sequences.

Please use the following reference as a guide for identifying and remedying inferior image quality, image artifacts, and subject issues that may degrade image quality. Also, please contact ADNIMRI@Mayo.edu for specific technical questions or concerns outside the scope of this manual.

Example 1: Image Degradation due to Movement Artifact



Problem:

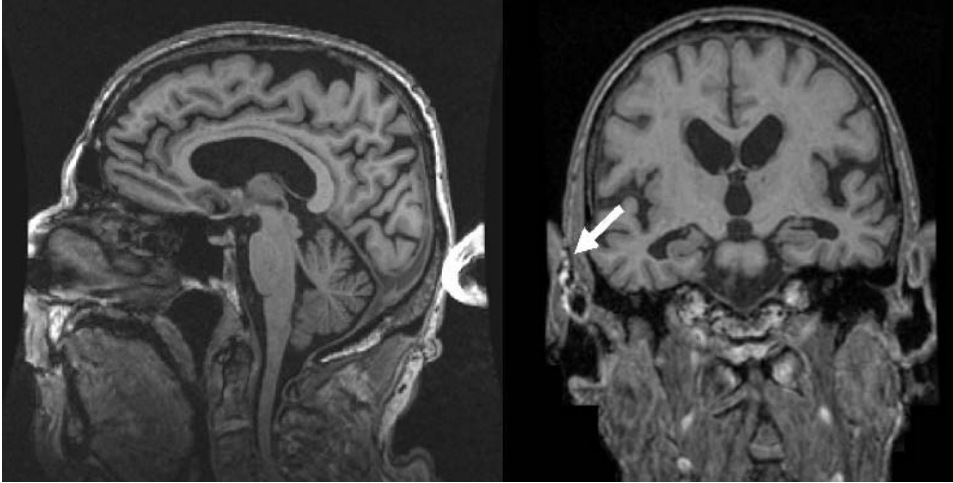
In this example movement has caused motion artifacts. Acquisitions with major motion artifacts will not be accepted and a repeat scan may be requested.

Possible Remedies:

If movement is due to the subject's head moving, reacquire MP-RAGE after tightly securing the subject's head with additional restraints and discussions with subject to hold their head still.

If the subject is not moving it is possible the artifact is the result of mechanical problems. Please discuss with your service engineer.

Example 2: Wrap Around



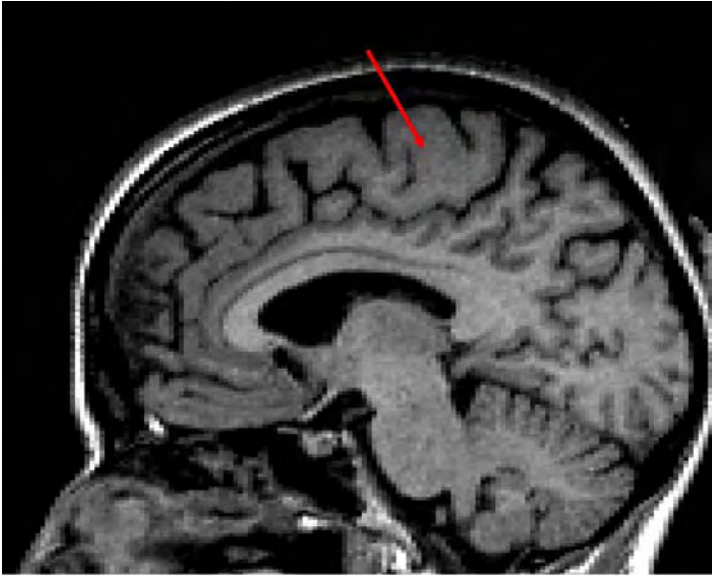
Problem:

In this example, wrap around occurs in the MP-RAGE image above. In the figure on the left, the nose folds into the back of the skull. In the figure on the right, the ear wraps into the side of the skull. Acquisitions with wrap around artifacts will not be accepted and a repeat scan will be requested.

Possible Remedy:

1. Wrap around generally occurs when the subject's head size is larger than the acquisition box. Please try to position the acquisition box so that the wrap can be avoided.
2. If not possible, please increase the FOV and increase the number of phase encoding steps accordingly so as not to change the pixel resolution of the image. Please remember this must be done on every subsequent scan.

Example 3: Signal Loss at the Top of the Brain



Problem:

In this example, the image has a loss of signal at the top of the brain due to incorrect positioning in the head coil. The subject was placed too high in the coil. Please note the lack of contrast between gray and white matter at the top of the brain only. Acquisitions with signal loss, especially due to incorrect positioning, will not be accepted and a repeat scan will be requested.

Possible Remedies:

1. Check to be sure subject is positioned correctly in the head coil. Please see “Subject Positioning” for information on positioning.
2. Make sure head coil is properly secured.

Example 4: Metal Artifact



Problem:

Magnetic field distortions: In this example there is a signal void due to the presence of metal near the subject's head. Acquisitions with metal artifact will not be accepted any circumstances and a repeat scan will be requested.

Possible Remedy:

1. Make sure the subject is not wearing any metal. Refer to Appendix 1. Check for hair clips, metallic makeup (i.e. permanent eyeliner), necklace, safety pins, removable dentures, and facial jewelry. Remove metal and rescan.

Appendix 5: FAQ's -- Frequently Asked Questions:

Q – My subjects head is tilted quite a bit. Can I oblique the scans then?

A – No, do not oblique the scans, we can deal with the subjects head being tilted more easily than we can with scans that were acquired obliquely.

Q – I forgot to put the marker on the subject. Do we need to rescan?

A – No, that will not be a reason for re-scan, please just try to remember next time.

Q – What is the phantom filled with?

A – Mostly distilled water and some anti mold ingredients. If you notice your water level is getting low, please top off with distilled water. Distilled water acts differently when imaged than tap water, so please make sure you are using distilled water.

Q – Can I scan the phantom in the same exam as the subject.

A – No please, start a new exam and name the phantom with the correct ID. The phantom scans are handled differently than the subject scans. Starting a new exam gives that study a different unique identifier (UID) thus much easier to upload separately and store separately.

Q – I noticed some wrap on my image. Should I increase the FOV to compensate.

A – No, unless the wrap is affecting brain tissue you do not need to re-scan. If the wrap is affecting brain tissue please try to place the FOV to avoid wrap if possible.

Q – Should I append this scan to the previous scan in the PACs system.

N – Please do not append the sessions, it causes the exams all to have the same UID.

Q – Do I need to have the subject remove their dentures.

A – Yes, please have all your subjects remove their dentures to avoid artifact.

Q – I did 3 ADNI GO subjects today. Do I need to scan the phantom 3 times?

A – No you just need to scan the phantom once per day for ADNI GO.

Q – I am having trouble with upload data to LONI, who do I contact?

A - adni@loni.ucla.edu

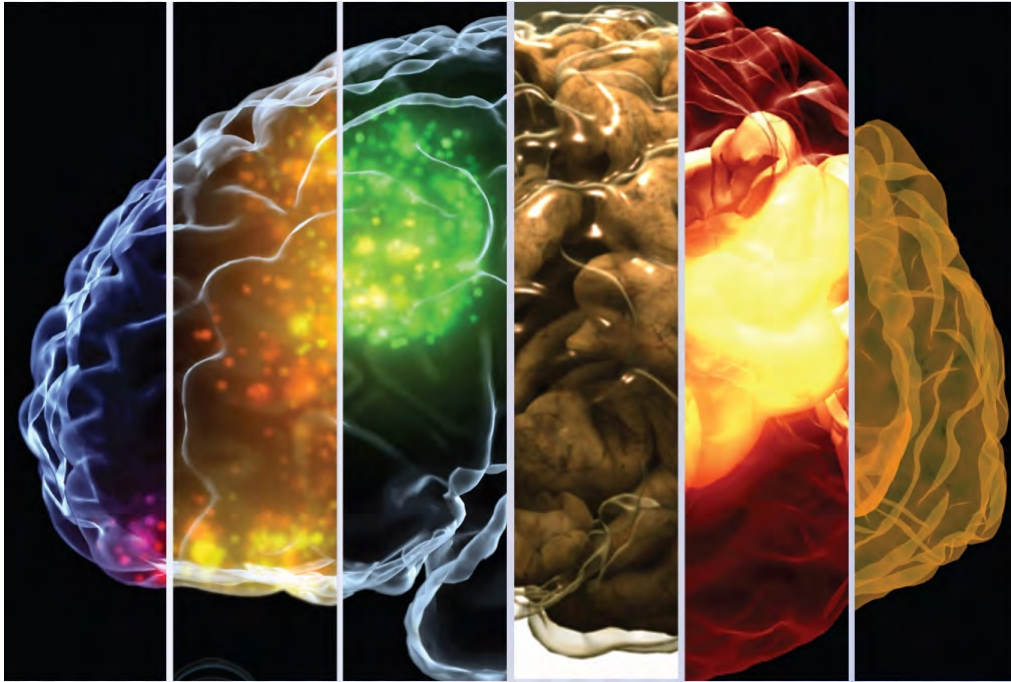
Q – The exam was already sent to LONI, do we need to keep a copy of it?

A – Yes, please keep a copy of all human AND QC phantom scans your site performs.

Q – Our scanner was upgraded, do I need to re-certify?

A – If it was a major upgrade (both software and hardware) the answer is yes. However, many minor upgrades do not need a full re-certification scan, just a phantom scan. In that case, we may just ask you run the QC phantom scans to make sure the pulse sequences are working.

Appendix 5: Data Transfer to LONI



Uploading MRI data to the Laboratory of Neuro Imaging (LONI)

Image Data Archive Instructions

CONTENTS:

- A - [Image Data Archive Overview](#)
- B - [System Requirements](#)
- C - [User Registration](#)
- D - [IDA Log in](#)
- E - [Archive Process Overview](#)
- F - [Archive Instructions](#)
- G - [Archiving Data in Batch](#)

A - IMAGE DATA ARCHIVE OVERVIEW

The LONI Image Data Archive (IDA) provides an integrated environment for safely archiving, querying and visualizing neuroimaging data utilizing a web-browser interface. The archive protects data from unauthorized access while providing the ability to share data among collaborative investigators.

For questions or problems with the IDA please send e-mail to adni@loni.ucla.edu

B - SYSTEM REQUIREMENTS

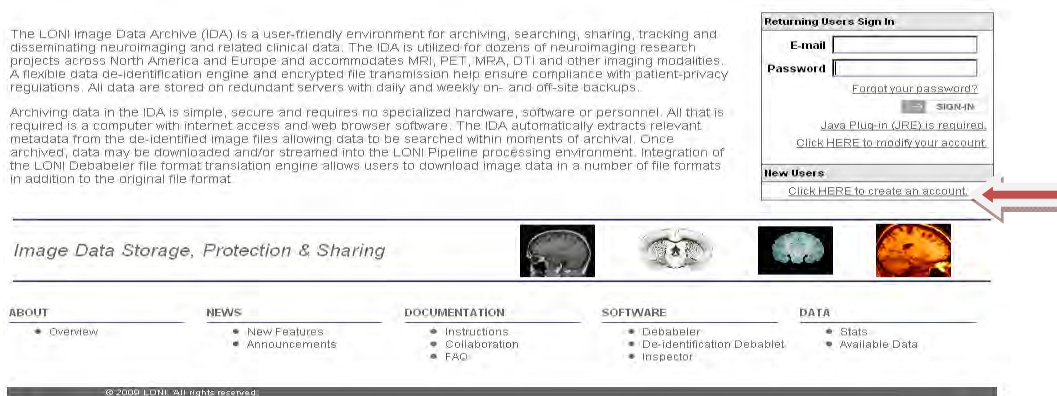
The IDA system requires a computer with internet access, newer web browser software (IE, Netscape, Mozilla, Safari), Java plug-in (version 1.5 or higher), and a valid user account.

C - USER REGISTRATION

1. Click "**Click here to create an account**" on the Image Data Archive Sign-In page. <https://ida.loni.ucla.edu>

The LONI Image Data Archive (IDA) is a user-friendly environment for archiving, searching, sharing, tracking and disseminating neuroimaging and related clinical data. The IDA is utilized for dozens of neuroimaging research projects across North America and Europe and accommodates MRI, PET, MRA, DTI and other imaging modalities. A flexible data de-identification engine and encrypted file transmission help ensure compliance with patient-privacy regulations. All data are stored on redundant servers with daily and weekly on- and off-site backups.

Archiving data in the IDA is simple, secure and requires no specialized hardware, software or personnel. All that is required is a computer with internet access and web browser software. The IDA automatically extracts relevant metadata from the de-identified image files allowing data to be searched within moments of archival. Once archived, data may be downloaded and/or streamed into the LONI Pipeline processing environment. Integration of the LONI Debabeler file format translation engine allows users to download image data in a number of file formats in addition to the original file format.



© 2009 LONI. All rights reserved.

2. Complete the **Create New Account** form then press the **Register** button. A temporary password will be sent to your email address.

Create New Account

SETUP NEW ACCOUNT	
Type in your E-mail address*	<input type="text"/>
Type in a user name* If you have a LONI account use your LONI user name	<input type="text"/>
PERSONAL INFORMATION	
First Name*	<input type="text"/>
Last Name*	<input type="text"/>
Institution / Company*	<input type="text"/>
Department	<input type="text"/>
Zip / Postal Code	<input type="text"/>
Country*	<input type="text"/>
If you have a website, please enter the URL here	<input type="text"/>
Required fields are denoted by an asterisk (*)	
Once you click Register, we'll send you an e-mail message containing your temporary password. To ensure your temporary password is received, you may need to add dba@loni.ucla.edu to your safe sender list.	
BY CONTINUING, YOU ARE AGREEING TO THE LONI TERMS OF USE <input type="button" value="REGISTER"/>	

D – IDA LOG IN

From the home page <https://ida.loni.ucla.edu/login.jsp?project=ADNI>, enter your e-mail address and password, then click the Sign-In button. New users, please refer to the user registration section for instructions on how to register for a user account.

1. On the Sign-in page, enter your e-mail address and password.
2. Click **Sign-In**.

ABOUT NEWS DOCUMENTATION SOFTWARE DATA LONI Home

The LONI Image Data Archive (IDA) is a user-friendly environment for archiving, searching, sharing, tracking and disseminating neuroimaging and related clinical data. The IDA is utilized for dozens of neuroimaging research projects across North America and Europe and accommodates MRI, PET, MRA, DTI and other imaging modalities. A flexible data de-identification engine and encrypted file transmission help ensure compliance with patient-privacy regulations. All data are stored on redundant servers with daily and weekly on- and off-site backups.

Archiving data in the IDA is simple, secure and requires no specialized hardware, software or personnel. All that is required is a computer with internet access and web browser software. The IDA automatically extracts relevant metadata from the de-identified image files allowing data to be searched within moments of archival. Once archived, data may be downloaded and/or streamed into the LONI Pipeline processing environment. Integration of the LONI Debabeler file format translation engine allows users to download image data in a number of file formats in addition to the original file format.

Returning Users Sign In

E-mail

Password

[Forgot your password?](#)

[Java Plug-In \(JRE\) is required.](#)

[Click HERE to modify your account.](#)

New Users

[Click HERE to create an account.](#)

Image Data Storage, Protection & Sharing

ABOUT NEWS DOCUMENTATION SOFTWARE DATA

- Overview
- New Features
- Announcements
- Instructions
- Collaboration
- FAQ
- Debabeler
- De-identification Debabeler
- Inspector
- Stats
- Available Data

E – ARCHIVE PROCESS OVERVIEW

The two steps that comprise the image archive process are de-identification and file transmission. The image files are de-identified at the user's local workstation, in accordance with HIPAA regulations and ensuring that no identifiable subject information crosses the network. Then, the de-identified files are securely transmitted to LONI and stored in the data archive.

SYSTEM REQUIREMENTS


The IDA system requires a computer with internet access, newer web browser software (IE, Netscape, Mozilla, Safari), Java plug-in (version 1.5 or higher), and a valid user account.

PROCESS

Following user authentication, the user chooses the data to be archived by selecting the directory where the data are located and chooses a directory where the de-identified files will be written. Next, a Java applet de-identifies the files, inserting the user-supplied subject identifier and removing or replacing other potentially identifying information. The user is given the opportunity to validate the de-identification results, prior to transmitting the images. Once the results of the de-identification process have been validated, the files are transmitted from the user's local computer to LONI. Upon arrival at LONI, the data are stored in a fault-tolerant storage area network and the database is populated with relevant metadata attributes.

The archive log in page is available from IDA Home page <https://ida.loni.ucla.edu/login.jsp?project=ADNI>. Enter your e-mail address and password then click the Sign-In button. New users, please refer to the user registration section for instructions on how to register as a user.

On the IDA Menu page, click the **Archive Files** button to upload images to the data archive.



LONI
Image Data Archive

ABOUT ▾ NEWS ▾ DOCUMENTATION ▾ SOFTWARE ▾ DATA ▾ LONI Home

LONI > Resources > Data

IDA Data Management Menu

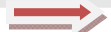
LOG OUT

Select an option from the menu below or click Logout to end your session. CURRENT PROJECT: ADNI ▾

Query
Search, find, view and download images.

- SIMPLE QUERY** Perform Simple Searches of the Database
- ADVANCED QUERY** Perform Advanced Searches of the Database
- DATA COLLECTIONS** Manage Data Collections: Download, Reorganize, etc.

Archive Files
Upload new images into the Image Data Archive.

 **ARCHIVE FILES** Load Image Data into the Archive

RELATED LINKS

- [DOJ Protection of Human Subjects >](#)
- [DHHS Privacy Rule >](#)
- [LONI De-Identification Policy \(PDF\) >](#)
- [LONI Policy \(PDF\) >](#)

F - ARCHIVE INSTRUCTIONS

The Archive and Review page is the starting point for uploading new images. The bottom portion of the page lists the last images uploaded by the user.

REQUIREMENTS:

- All image files for each subject must be within a single directory tree, which may contain subdirectories.
- The source directory must not contain multiple image formats.
- An empty directory for holding the de-identified files.

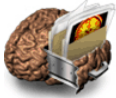
DEFINITIONS

- The **Source Directory** is where the original files are located.
- The **Target Directory** is an empty directory, where the new, de-identified files will be written.

NOTES

- The browser window must remain open during the entire upload process.
- Closing the browser window will cancel the upload.
- Compressing files will speed the upload process for computers with slower connections.
- Files being uploaded will not be modified (lossless compression).

On the “Archive and Review” page, select your **Project/Site** from the drop down menu and click the “**Single Archive**” button. Do not open multiple IDA browser windows when archiving data.



[LONI](#) > [Resources](#) > [Data](#)

Archive and Review

[MENU](#) | [LOG OUT](#)

PROJECT INFORMATION:

Select Project:

ADNI@University of California, Los Angeles

ARCHIVE FILES:

The data archival process involves two basic steps:

1. De-identify the header file by replacing any fields that identify the subject, such as Patient Name and ID, and
2. Transmit image data securely from the local site to LONI.

To archive a single study, click the SINGLE ARCHIVE button.

To archive multiple studies in batch mode, click the BATCH ARCHIVE button.

NOTE: Do not open multiple IDA browser windows while archiving data.

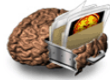
VIEW RECENTLY ARCHIVED VOLUMES:

Click on the VIEW button to visualize the volumetric representation of your uploaded files.
Click on the REFRESH button to update the volume list.

SUBJECT ID	SERIES DESCRIPTION	NO OF IMAGES	DATE ▲	View	Download
01_555	SAG MPRAGE 8 CHANNEL	1	Tue, 01/19/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
8596902	t1_mpr_cor	256	Wed, 01/13/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
8596702	t1_mpr_cor	256	Wed, 01/13/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
8596701	t1_mpr_cor	256	Wed, 01/13/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
8595602	t1_mpr_cor	256	Wed, 01/13/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
8592950	t1_mpr_cor	256	Wed, 01/13/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
8587301	t1_mpr_cor	256	Wed, 01/13/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
8066250	t1_mpr_cor	256	Wed, 01/13/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
8066201	t1_mpr_cor	256	Wed, 01/13/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
8913502	t1_mpr_cor	256	Wed, 01/13/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
8897001	t1_mpr_cor	256	Wed, 01/13/2010	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>

Step 1:

Complete the required information on the De-Identify page then click the **Continue** button.



LONI > Resources > Data
De-identify

MENU | LOG OUT

1

STEP ONE: DE-IDENTIFICATION
THE DE-IDENTIFICATION PROCESS REMOVES CERTAIN DATA ELEMENTS FROM THE FILE HEADER AND REPLACES THE PATIENT ID WITH AN ALTERNATE SUBJECT IDENTIFIER PROVIDED BY THE USER.

- Select the type of data to be uploaded (Original/Processed) then complete the form entries.
- The Subject ID you provide replaces the existing Patient ID in the image file(s). It is recommended that a separate cross reference of original and replacement subject identifiers are kept externally.
- Source directory is the directory in which the original files are located (contains image files only).
- Target directory is an empty directory which will contain the new, de-identified files.
- Click the Continue button to begin the de-identification process.
- Check the Bypass validation steps checkbox to upload files without validating de-identification results.

Please follow the instructions outlined above:

Project ADNI@UCLA Bypass validation steps

Select Data Type Original XML

Research Group

Visit

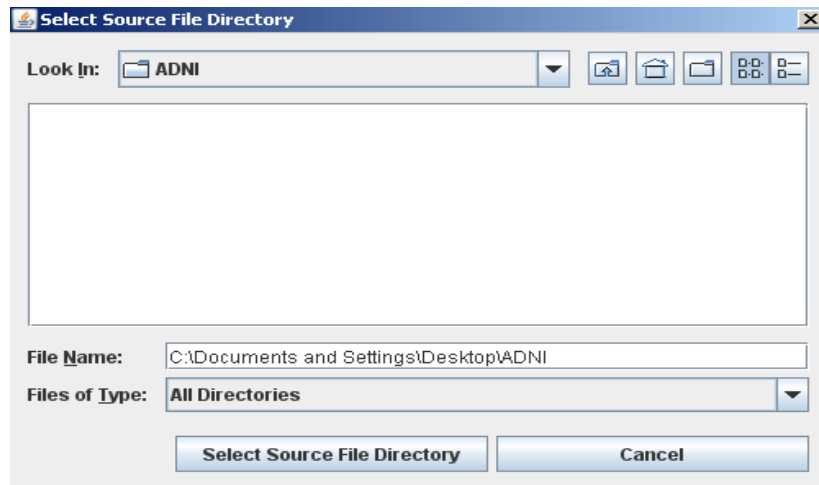
Subject ID: Max. 10 characters allowed
Identifier to replace Patient ID

Source Directory: BROWSE...
Location of original files

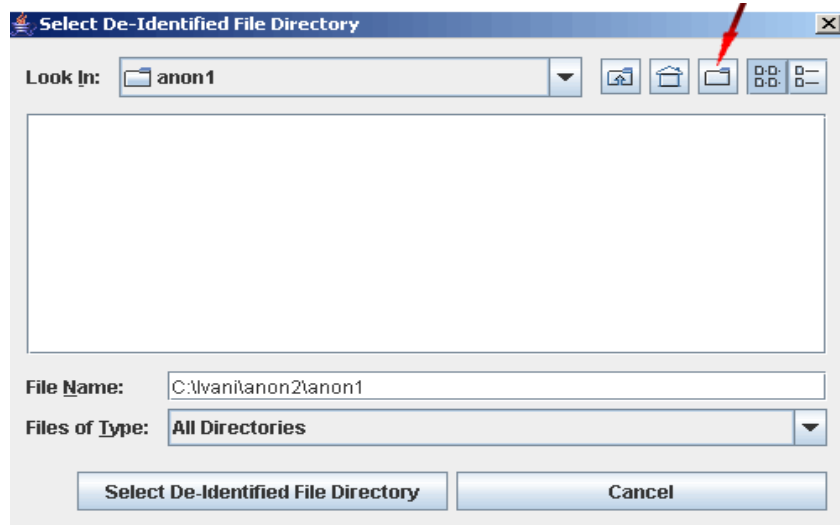
Target Directory: BROWSE...
Location for target files

NOTE: Source Directory for file formats with complete headers (DICOM, GE, ECAT, etc) may contain multiple series from a single subject. Source Directory for file formats with limited headers (ANALYZE, MINC) or no headers (TIFF, TGA, etc) must contain a single series for a single subject in a single directory. Headerless files must contain a sequential slice number within the file name. ANALYZE files are assumed to be in SPM orientation.

1. Select the data type: choose **Original**.
2. Select the **Research Group** from the drop-down menu.
3. Select the **Visit** type from the visit drop-down menu.
4. Provide a **Subject ID**.
5. Click **Source Directory Browse**. The Select Source file Directory window will open. Find the directories that contain files to be uploaded or fill in the directory path. Click **Select Source File Directory**.



6. Click Target Directory **Browse** button to select a directory to contain the de-identified files. A new target directory may be created by clicking the folder icon, as shown below. The target directory for holding the de-identified files must be empty.



7. To upload files without validating de-identification results and upload all series without further interaction, check the **Bypass validation steps** box (Not recommended for first time users.)

Click **Continue** to begin the de-identification process

Step 2:

When the de-identification step is complete, a list of de-identified files is shown along with the de-identified header information.

After reviewing the metadata click **Submit** to transmit the de-identified images.

To remove any images, uncheck the **Selected** box beside the image sequence.

The **Compress files before transmitting** checkbox is automatically checked.

Compressing files will speed the upload process.

Clicking **Discard** will cancel the upload and return to the previous page.

[LONI > Resources > Data](#)

Verify & Submit Data

[MENU](#) | [LOG OUT](#)

IN THIS SECTION:

2

STEP TWO: VERIFY & SUBMIT DATA

THE VERIFY PROCESS LETS YOU CONFIRM THE ACCURACY OF THE DE-IDENTIFIED INFORMATION AND DESELECT DATA SETS BEFORE YOU SUBMIT THEM TO THE LONI ARCHIVE FOR STORAGE.

[1: De-Identify](#)
[2: VERIFY & SUBMIT DATA](#)
[3: Confirmation](#)

- Review the de-identified metadata below. If you need to make corrections, please use the Back button in your browser window to return to the previous page.
- Review the listed data sets in the box below. Uncheck the box beside any data set which you dont want submitted (such as a localizer or scout).
- Click the SUBMIT button to start the data transmission process.

DE-IDENTIFIED FILES:

Subject ID	Sequence Name	Number of Images	Selected
035_S_0003	SAG MPRAGE 8 CHA...	1	<input checked="" type="checkbox"/>

Compress files before transmitting

REVIEW DE-IDENTIFIED HEADER INFORMATION:

LONI De-Identified File Attributes

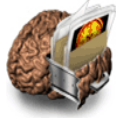
Series Description: SAG MPRAGE 8 CHANNEL
Series ID: 4.38_2A51x0.2IUGuEgwSGvL8BP0G4imEXbNq2_Nyp8jWB9f51brR5_JBAEEda2LRS
C:\Documents and Settings\ivani\Desktop\test\New Folder\4.38_2A51x0.2IUGuEgwS

Metadata for DICOM file ADNI_035_S_0003_MR_SAG_MPRAGE_8_CHANNEL_br_raw_201001

Tag	Tag Description	Tag Value
00020000	Group Length.	180
00020001	File Meta Information Version.	0001
00020002	Media Storage SOP Class UID.	1.2.840.10008.5.1.4.1.1.4
00020003	Media Storage SOP Instance UID.	2.16.124.113543.6006.99.1612868
00020010	Transfer Syntax UID.	1.2.840.10008.1.2.1
00020012	Implementation Class UID.	2.16.124.113543.6006.99.1249489
00080000	Group Length.	778
00080005	Specific Character Set.	ISO_IR 100
00080008	Image Type.	ORIGINAL PRIMARY M ND
00080016	SOP Class UID.	1.2.840.10008.5.1.4.1.1.4
00080018	SOP Instance UID.	2.16.124.113543.6006.99.1612868

Step 3:

The progress bar will show the progress of the upload process. When the transmission is complete choose to Archive More files, Review Uploaded Files, or Log Out.



LONI
Image Data Archive



ABOUT ▾ NEWS ▾ DOCUMENTATION ▾ SOFTWARE ▾ DATA ▾ [LONI Home](#)

[LONI](#) > [Resources](#) > [Data](#)

Confirmation

[MENU](#) | [LOG OUT](#)

IN THIS SECTION:

3

CONFIRMATION

THE ARCHIVE PROCESS HAS COMPLETED AND THE FILES LISTED IN THE TRANSMISSION RESULTS WINDOW HAVE BEEN TRANSMITTED TO THE LONI ARCHIVE.

- To archive additional image data, click the ARCHIVE MORE button.
- To review your most recently archived data, click the REVIEW UPLOADED FILES button.
- To keep a record of the archived data, please print and retain the Log File specified in the TRANSMISSION RESULTS window.

[1: De-Identify](#)

[2: Verify & Submit Data](#)

[3: CONFIRMATION](#)

TRANSMISSION RESULTS

Progress:

Your Connection Speed:

Modem DSL T1 LAN

Completed at 1376 KB/s.
Uploading file 2/2 parameters.xml ...
Completed at 12 KB/s.
Tue Jan 19 17:55:46 PST 2010 Finished upload at 1001.0 KB/s.

G. ARCHIVING DATA IN BATCH

The Batch Archive process is similar to Single Archive, except that multiple subjects and image series can be added to the queue and submitted in a batch. The Batch Archive can be used to de-identify and archive files from multiple acquisitions and/or subjects. Batches may be of the same or different file formats and modalities.

The advantage of archiving images in batch is the possibility to upload several images simultaneously. However, the batch option does not allow the user to review results of the de-identification process prior to the upload.

BATCH ARCHIVE INSTRUCTIONS

On the “Archive and Review” page, select your **Project/Site** from the drop down menu and click the “**Batch Archive**” button. Do not open multiple IDA browser windows when archiving data.

Archive and Review

PROJECT INFORMATION: MENU | LOG OUT

Select Project: ADNI@University of California, Los Angeles

ARCHIVE FILES:
The data archival process involves two basic steps:
1. De-identify the header file by replacing any fields that identify the subject, such as Patient Name and ID, and
2. Transmit image data securely from the local site to LONI.

To archive a single study, click the SINGLE ARCHIVE button.
To archive multiple studies in batch mode, click the BATCH ARCHIVE button.

NOTE: Do not open multiple IDA browser windows while archiving data.

VIEW RECENTLY ARCHIVED VOLUMES:
Click on the VIEW button to visualize the volumetric representation of your uploaded files.
Click on the REFRESH button to update the volume list.

SUBJECT ID	SERIES DESCRIPTION	NO. OF IMAGES	DATE ▲	View	Download
01_555	SAG MPRAGE 8 CHANNEL	1	Tue, 01/19/2010	VIEW	DOWNLOAD
8596902	t1_mpr_cor	256	Wed, 01/13/2010	VIEW	DOWNLOAD
8596702	t1_mpr_cor	256	Wed, 01/13/2010	VIEW	DOWNLOAD
8596701	t1_mpr_cor	256	Wed, 01/13/2010	VIEW	DOWNLOAD
8595602	t1_mpr_cor	256	Wed, 01/13/2010	VIEW	DOWNLOAD
8592950	t1_mpr_cor	256	Wed, 01/13/2010	VIEW	DOWNLOAD
8587301	t1_mpr_cor	256	Wed, 01/13/2010	VIEW	DOWNLOAD
8066250	t1_mpr_cor	256	Wed, 01/13/2010	VIEW	DOWNLOAD
8066201	t1_mpr_cor	256	Wed, 01/13/2010	VIEW	DOWNLOAD
8913502	t1_mpr_cor	256	Wed, 01/13/2010	VIEW	DOWNLOAD
8897001	t1_mpr_cor	256	Wed, 01/13/2010	VIEW	DOWNLOAD

Complete the required information on the De-Identify page then click the **Continue** button.

De-identify

STEP ONE: DE-IDENTIFICATION
THE DE-IDENTIFICATION PROCESS REMOVES CERTAIN DATA ELEMENTS FROM THE FILE HEADER AND REPLACES THE PATIENT ID WITH AN ALTERNATE SUBJECT IDENTIFIER PROVIDED BY THE USER.

- Select the type of data to be uploaded (Original/Processed) then complete the form entries.
- The Subject ID you provide replaces the existing Patient ID in the image file(s). It is recommended that a separate cross reference of original and replacement subject identifiers are kept externally.
- Source directory is the directory in which the original files are located (contains image files only).
- Target directory is an empty directory which will contain the new, de-identified files.
- Click the Continue button to begin the de-identification process.
- Check the Bypass validation steps checkbox to upload files without validating de-identification results.

Please follow the instructions outlined above:

Project: ADNI@UCLA Bypass validation steps

Select Data Type: Original XML

Research Group: [Dropdown]

Visit: [Dropdown]

Subject ID: [Text Field] Max: 10 characters allowed

Source Directory: [Text Field] [BROWSE...]

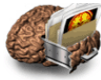
Target Directory: [Text Field] [BROWSE...]

NOTE: Source Directory for file formats with complete headers (DICOM, GE, ECAT, etc) may contain multiple series from a single subject. Source Directory for file formats with limited headers (ANALYZE, MINC) or no headers (TIFF, TGA, etc) must contain a single series for a single subject in a single directory. Headerless files must contain a sequential slice number within the file name. ANALYZE files are assumed to be in SPM orientation.

[CANCEL] [CONTINUE]

On the Batch Queue page, click the **Add More** button to add more studies. Repeat this process for each study or subject to be archived. Click **Remove** to remove from the queue images that should not be archived.

When all desired images are added to the queue, click **Submit** to de-identify and upload all files.



LONI > Resources > Data

Image Database Batch Queue

MENU | LOG OUT



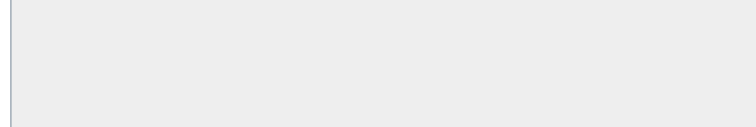
REVIEW BATCH QUEUE

THE IMAGE STUDIES LISTED BELOW HAVE BEEN PREPARED FOR BATCH DE-IDENTIFICATION AND UPLOAD.

- Click "ADD MORE" to add another study to the queue or "SUBMIT" to archive this batch now.
- REMEMBER to leave your browser window open until all uploads are complete and you have been returned to this page or the Archive & Review page.
- Click "CLEAR" to clear the batch queue. All logs will be deleted.

CANCEL

Subject	Data Type	Research Group	Source	Status	Date	Remove
035_S_0003	Original	Patient	C:/Documents and Settings/ivani/...	Queued	1/20/10	remove
035_S_0005	Original	Patient	C:/Documents and Settings/ivani/...	Queued	1/20/10	remove

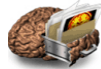


CLEAR ADD MORE SUBMIT

No further interaction is necessary until the process is completed and the browser returns to the Image Database Batch Queue page with a listing of recently archived files and their statuses.

Check the **Status** column to verify if the file(s) were successfully archived as below.

Click **Clear** to return to the Archive and Review page.



LONI > Resources > Data

Image Database Batch Queue

MENU | LOG OUT



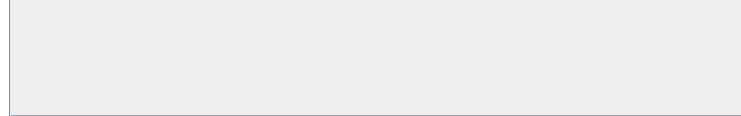
REVIEW BATCH QUEUE

THE IMAGE STUDIES LISTED BELOW HAVE BEEN PREPARED FOR BATCH DE-IDENTIFICATION AND UPLOAD.

- Click "ADD MORE" to add another study to the queue or "SUBMIT" to archive this batch now.
- REMEMBER to leave your browser window open until all uploads are complete and you have been returned to this page or the Archive & Review page.
- Click "CLEAR" to clear the batch queue. All logs will be deleted.

CANCEL

Subject	Data Type	Research Group	Source	Status	Date	Remove
035_S_0003	Original	Patient	C:/Documents and Settings/ivani/...	Archived	1/20/10	remove
035_S_0005	Original	Patient	C:/Documents and Settings/ivani/...	Archived	1/20/10	remove



CLEAR ADD MORE SUBMIT

