

# **ADNI**

## **Alzheimer's Disease Neuroimaging Initiative MRI Technical Procedures Manual**

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## **I. Contact Information**

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

**[adnimri@mayo.edu](mailto: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](mailto:adni@loni.ucla.edu)**

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

## **II. ADNI Study Overview**

## ***Background***

Over 4 million people in the US have Alzheimer's Disease or AD, and a very substantial number have other dementias. The cost to the US economy is well over \$100 billion/yr. The incidence of dementia is expected to double during the next 20 years. No existing treatment has yet been shown to slow the progression of AD but a large number of potential treatments are under development. Once such treatments for patients with AD are approved, the next obvious step will be to perform prevention trials on those at high risk for AD, such as subjects with MCI, family histories of dementia, or genetic risk factors for AD. Many elderly people have memory problems or other risk factors for AD. Once effective treatments for AD emerge, it will be very important to identify subjects at risk for cognitive decline and dementia at the earliest stage possible.

The Alzheimer's Disease Neuroimaging Initiative will be used to help researchers and clinicians develop new treatments and monitor their effectiveness. This will increase the safety and efficacy of drug development by decreasing the time and cost of clinical trials. This project is the most comprehensive effort to date to combine neuroimaging and other biomarkers of the cognitive changes associated with Mild Cognitive Impairment (MCI) and Alzheimer's Disease (AD).

## ***Goal***

The Alzheimer's Disease Neuroimaging Initiative (ADNI) is a 5-year public-private partnership to test whether serial magnetic resonance imaging (MRI), positron emission tomography (PET), other biological markers, and clinical and neuropsychological assessment can be combined to measure the progression of mild cognitive impairment and early Alzheimer's disease. There are three major goals of ADNI. The first goal is to develop improved methods that will lead to uniform standards for acquiring longitudinal, multi-site MRI and PET data on patients with Alzheimer's disease, mild cognitive impairment, and elderly controls. The second goal is to create a generally accessible data repository that describes longitudinal changes in brain structure and metabolism while acquiring clinical, cognitive and biomarker data for validation of imaging surrogates. The final goal is to determine those methods that provide maximum power to determine treatment effects in trials involving these patient groups. It is expected that ADNI will provide extensive new data concerning the natural history of brain changes which occur during the transition from normal aging to MCI to AD that can be used for future design and power of clinical trials and extensive information about the relationship between brain imaging changes and changes in biomarkers obtained from blood and CSF.

## ***Study design for the ADNI trial***

AD subjects (200) will be studied at 0, 6, 12, 24 months.

MCI subjects at high risk for conversion to AD (400) will be studied at 0, 6, 12, 18, 24, 36 months.

Age matched controls (200) will be studied at 0, 6, 12, 24 and 36 months.

25% of the subjects will be scanned at 3 Tesla at every timepoint.

1.5T Scans = 4200 -- 3T Scans = 1050

Total MRI scans performed for ADNI trial: 5250

### **III. Site Qualification**

## **A. Site Qualification Overview:**

Prior to any ADNI subjects being scanned at a particular site, that site must complete ADNI site qualification. Site qualification includes two different exams. The first, being a scan on the specially designed ADNI phantom with the ADNI sequences loaded by your local service engineer, with an additional coronal MP-RAGE. Secondly, your site will be asked to scan a human volunteer with the approved ADNI sequences loaded by your local service engineer. Mayo QC will review the phantom and human scans for the correct parameters and good image quality. If the phantom scan does not pass Mayo QC review, your site will be asked to re-scan the phantom after making suggested changes by the Mayo QC team.

**Please note: The same MRI scanner must be used for site qualification and ALL subsequent subject scans during the ADNI trial. 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 qualified scanner.**

### ***Phantom Scan Protocol:***

- 1) Localizer
- 2) MP-RAGE (with slice thickness increased to cover phantom)
- 3) MP-RAGE - REPEAT (same as above)
- 4) B1 Calibration - Head Coil (if applicable)
- 5) B1 Calibration - Body Coil (if applicable)
- 6) T2 Dual Echo (Straight Axial - Through center of phantom)
- 7) MP-RAGE CORONAL (with slice thickness increased to cover phantom)

### ***Human Volunteer Scan Protocol:***

*(No adjustments should be made to this protocol)*

- 1) Localizer
- 2) MP-RAGE
- 3) MP-RAGE - REPEAT
- 4) B1 Calibration - Head Coil (if applicable)
- 5) B1 Calibration - Body Coil (if applicable)
- 6) T2 Dual Echo (Straight Axial - cover below cerebellum through top of head)

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 these site qualification scans please contact:***  
[adnimri@mayo.edu](mailto:adnimri@mayo.edu)



## **B. Phantom Scan Instructions:**

For site qualification, each site must scan the ADNI phantom using the electronically loaded ADNI protocols with an additional coronal MP-RAGE. There should be one phantom qualification scan on 1.5T and 3T (if applicable).

*Note: This can be done prior to IRB approval*

**Please Note:** Your MRI scanner vendor (GE, Siemens, or Phillips) 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](mailto:adnimri@mayo.edu)  
**Use only the imported ADNI sequences.**

### ***Phantom Positioning:***

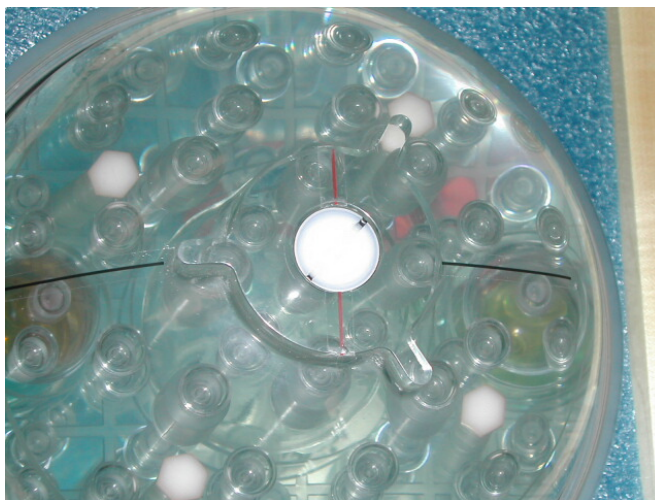
The following image shows the phantom placed in the appropriate position within the 8-channel coil. Achieving a reproducible position is a key element to the system performance analysis that will be conducted after each ADNI subject that is imaged. The phantom should be placed in the coil with the alignment 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 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 protocol plus an additional coronal MP-RAGE.

**Phantom Scan Protocol:**

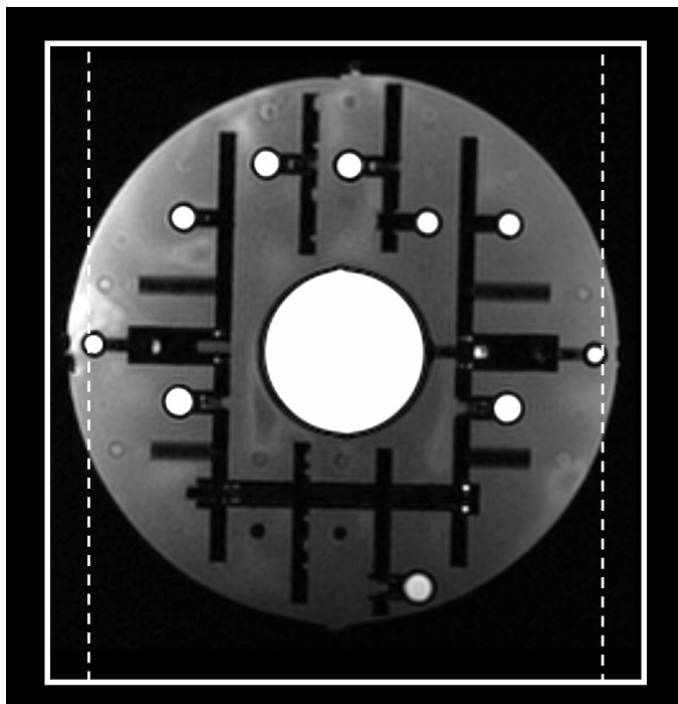
- 1) Localizer
- 2) MP-RAGE (with slice thickness increased to cover phantom)
- 3) MP-RAGE - REPEAT (same as above)
- 4) B1 Calibration - Head Coil (if applicable)
- 5) B1 Calibration - Body Coil (if applicable)
- 6) T2 Dual Echo (Straight Axial - through the center of the phantom)
- 7) MP-RAGE CORONAL (with slice thickness increased to cover the phantom)

**1. Localizer**

Please run a localizer to be sure the phantom is positioned correctly in the head coil.

**2. Sagittal MP-RAGE**

It is important to use the official ADNI parameters for these sequences, with one exception. Increase the slice thickness of the MP-RAGE acquisitions by 0.1 (so 1.2 becomes 1.3 etc.), until the left-to-right field or top bottom field of view is sufficiently large enough to avoid clipping the sides of the phantom. *NOTE: This may not be necessary on some systems.* Please see following examples:



*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.*

3. **Sagittal MP-RAGE REPEAT**

Repeat the identical MPRAGE as above with no changes to the scan prescription.

4. **B1 Calibration Head Coil** (if applicable)

Position the acquisition box to cover the entire phantom.

5. **B1 Calibration Body Coil** (if applicable)

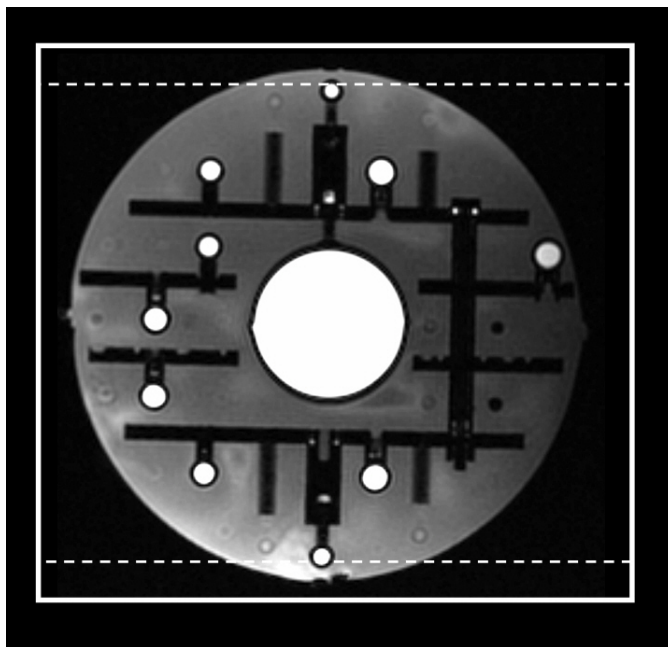
Position the acquisition box to cover the entire phantom.

6. **T2 Dual Echo**

Straight Axial acquisition through the center of the phantom.

7. **MP-RAGE Coronal**

In addition to the ADNI protocol please add one additional acquisition that will be the same prescription as the previous sagittal MPRAGE. **Only change the position to a CORONAL sequence.** This is important and will allow us to use both the sagittal and coronal MPRAGE acquisitions to assess system distortion. *NOTE: This coronal will only be acquired for site qualification purposes. Please see example.*



*Again, 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.*

***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 protocol and your site has passed the phantom scan qualification, one human volunteer must be scanned using the ADNI scanning protocol at 1.5T and one at 3T (*if applicable*).
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 sequences.

**Human Volunteer Scan Protocol:** *(no adjustments should be made to this protocol)*

- 1) Localizer
- 2) MP-RAGE
- 3) MP-RAGE - REPEAT
- 4) B1 Calibration - Head Coil (if applicable)
- 5) B1 Calibration - Body Coil (if applicable)
- 6) T2 Dual Echo (Straight Axial - cover below cerebellum through top of head)

*Please make sure to use stereotactic marker on subjects' right temple. Please see "MRI Pre-Scan Procedures" for complete instructions on scanning set-up and acquisition.*

**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\_YYYY (X=Site#/V=Volunteer#/Y=Phantom#)

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

**007\_V\_0001**

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](mailto: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**

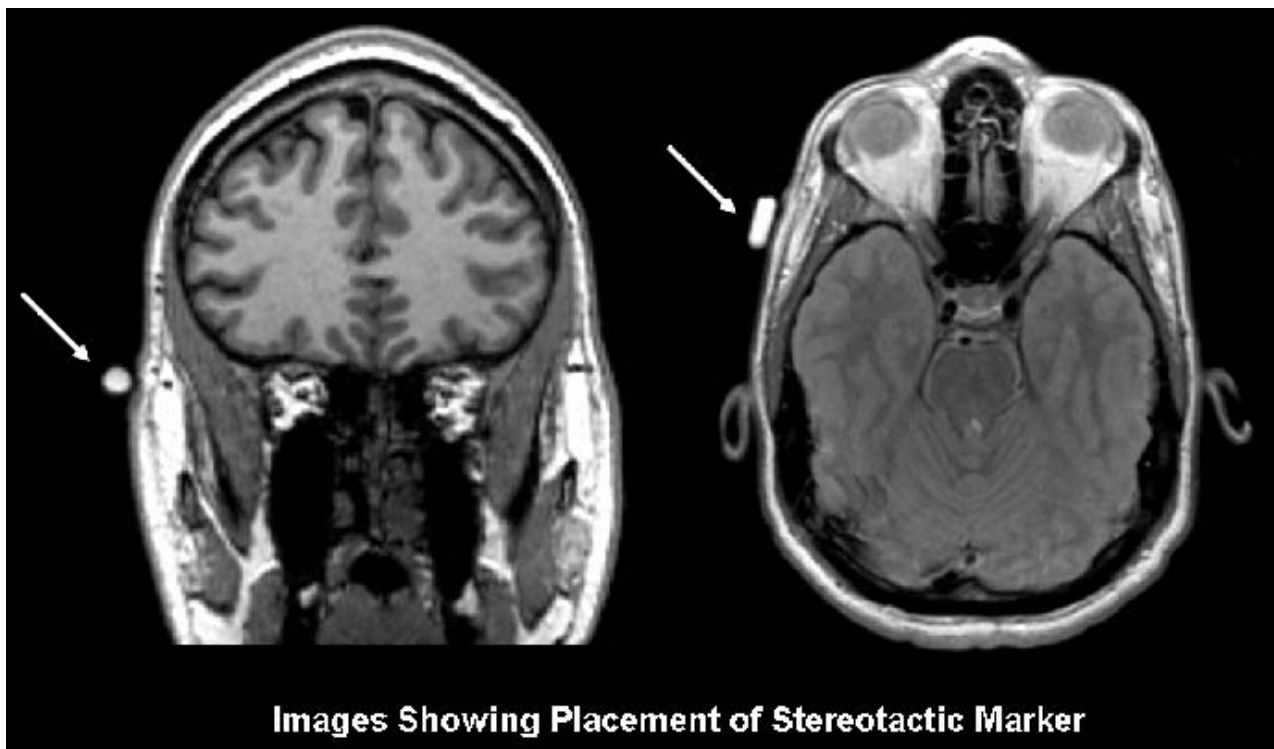
1. All sites should follow the standard subject consent protocols as approved by your local IRB. Explain the scan procedure to the subject so that they know what to expect during the MRI.
2. Provide the subject with the opportunity to use the restroom before the scan begins.
3. Please use universal MRI 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 O<sub>2</sub> 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:**

- Localizer Scan (20 secs)
- MP RAGE (8-10 mins)
- MP RAGE - Repeat (8-10 mins)
- B1 Calibration Scan - PA coil on GE and Siemens only (30 secs).
- B1 Calibration Scan - Body coil on GE and Siemens only (30 secs).
- Double Spin Echo T2 (5 mins)

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

- Localizer Scan (20 secs)
- MP RAGE (8-10 mins)

**Detailed acquisition parameters can be found in Appendix 3**

**The Mayo QC team will check all imaging parameters to assure the correct sequence was used. If the electronically loaded ADNI 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**

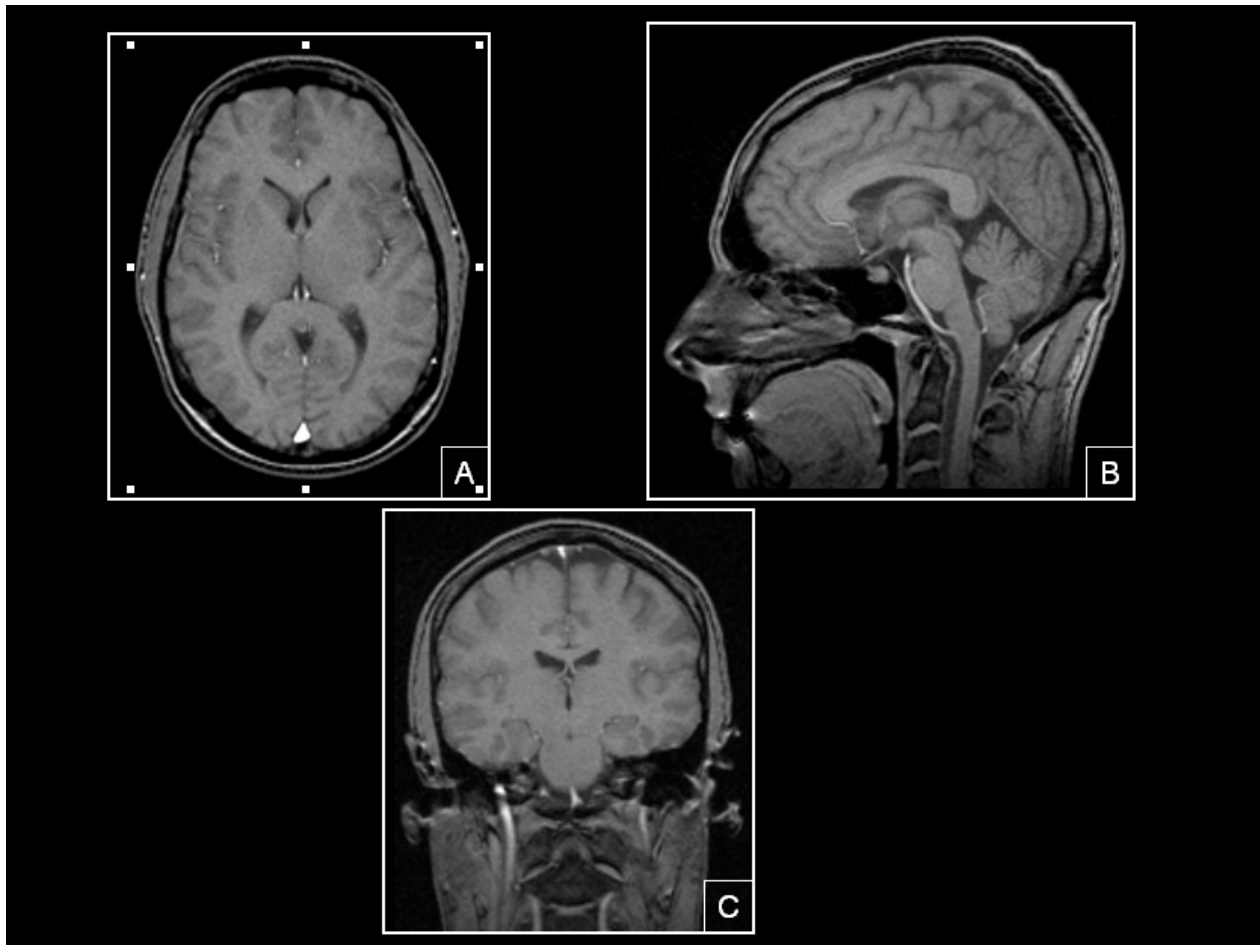
1. The “MRI Scan Information Form” should be completed at the time of acquisition for every ADNI subject. A copy of the MRI worksheet is included in Appendix 2.
2. The study coordinator at the referral site should complete the top section of the MRI Scan Worksheet. If this section is incomplete, please 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 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](mailto: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. Scan #1: Tri-Planar Scout: (If available, otherwise use a straight axial localizer)**

1. A quick acquisition in 3 orthogonal planes for anatomical orientation. One slice 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 straight, not in an oblique orientation.
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.

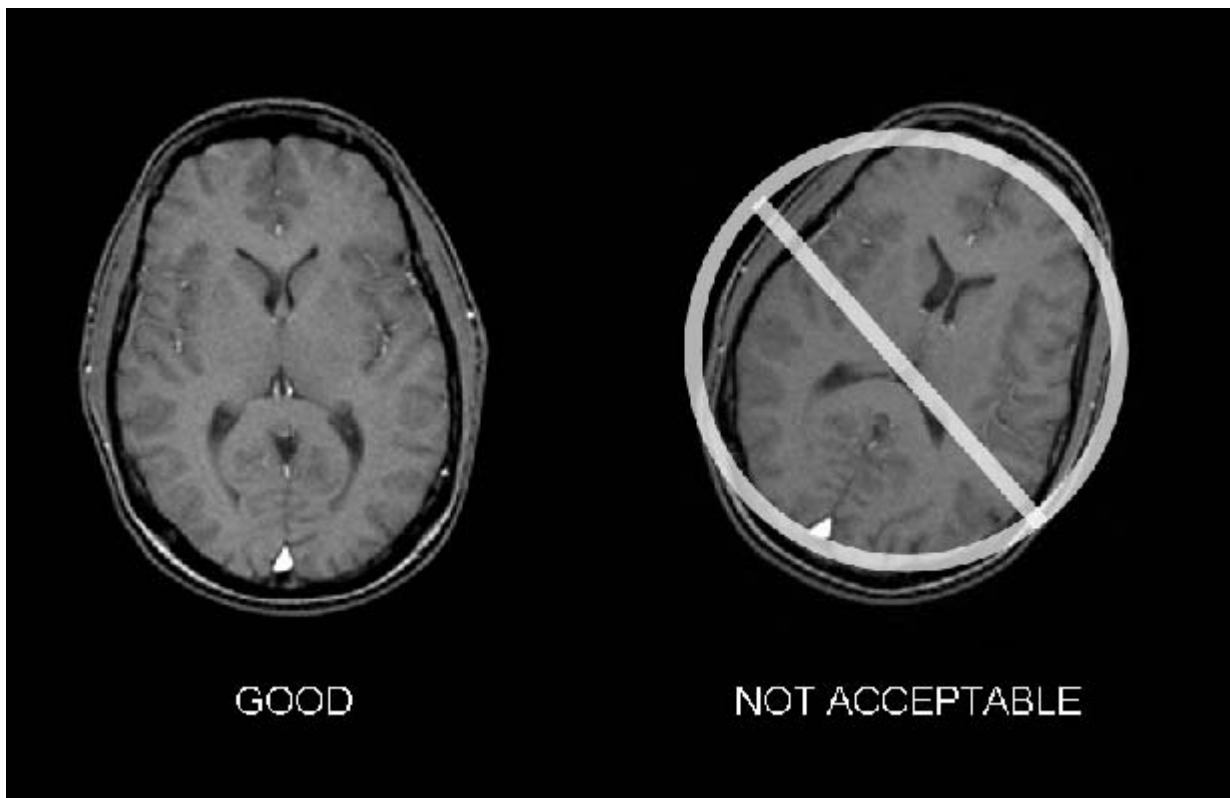


*Box A – Axial image. FOV placed in center to avoid side-to-side wrap.*

*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.*

#### **D. Pre-scan Adjustments**

1. Most modern MRI scanners provide automated adjustment procedures for RF coil tuning and frequency adjustments after the subject is positioned in the magnet. Follow the adjustment procedures provided by the manufacturers.

#### **E. Scan #2: 3D MP-RAGE**

**Please Note:** Your MRI scanner vendor (GE, Siemens, or Phillips) will be supplying electronic protocols (WIPs) for installation by your local service engineer for your specific MRI system(s). This will ensure that you have the correct protocol for your MRI scanner.

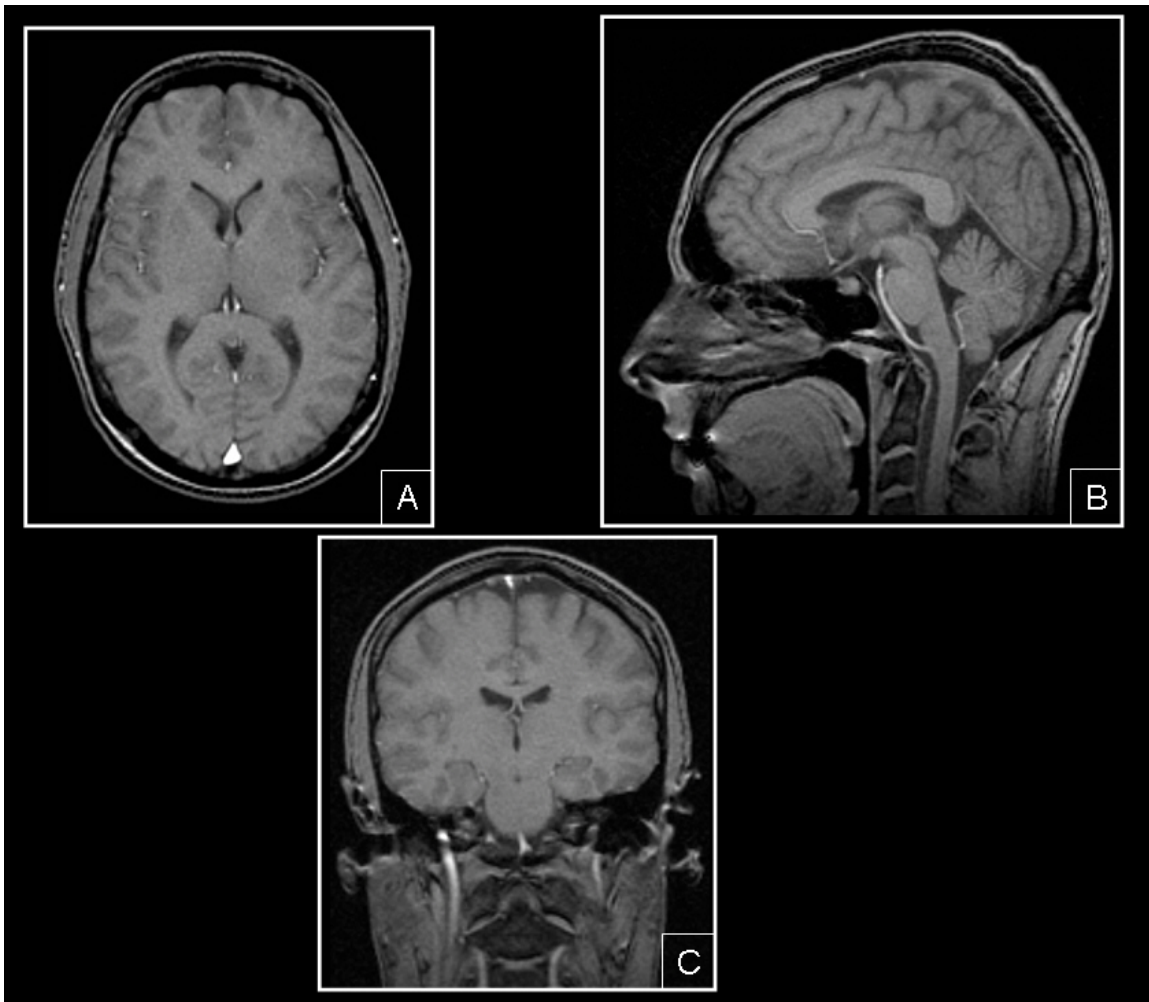
If you have any questions about this procedure please contact: [ADNIMRI@Mayo.edu](mailto:ADNIMRI@Mayo.edu)

**Use only the imported ADNI sequences.**

Use only the ADNI sequences imported onto your scanner. A detailed description of the MP-RAGE sequence can be found in Appendix III. **Please make sure to use the correct protocol for your manufacturer, scanner type, software revision, and field strength.**

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 will result and the study cannot be processed.** 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



- 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.



## F. Scan#3: 3D MP-RAGE Scan Repeat

For every ADNI exam, the sagittal MP-RAGE sequence is acquired a second time, immediately after the first. Unless indicated, the scan prescription should be identical for each MP-RAGE.

The MP-RAGE is run twice for several reasons. Often subjects move to varying degrees during MRI acquisitions, so that either the first or second MP-RAGE acquisition will be of superior quality. Thus, acquiring two MP-RAGES will maximize the chance that at least one will be successful and usable for analysis. Also, in some cases, where both MP-RAGES are of good quality, it would be possible to retrospectively average the two data sets to improve the signal-to-noise.

Since there are two MP-RAGES built into the ADNI scanning session, it is acceptable if one the MP-RAGES is not considered of satisfactory quality. However, if neither of the MP-RAGES is considered acceptable, you are encouraged to attempt one more additional MP-RAGE. If after three attempts, and no acceptable MP-RAGES have been acquired, please discontinue the exam and notify the study coordinator.

### **Please Note:**

- It is mandatory that the ADNI 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 site qualified scanner be used for all subjects in the ADNI study.
- Failure to use the ADNI site qualified scanner for all subjects in the ADNI will result in the request for a rescan of the subject.

**G. Scan #4: B1 Calibration Head Coil Scan: (Only applicable for phased array head coil on GE and Siemens systems)**

1. **Orientation:** Straight sagittal
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 will result and the study cannot be processed.** Please see the images below and use as a guide to correctly position the acquisition box.

**H. Scan #5: B1 Calibration Body Coil Scan: (Only applicable for phased array head coil on GE and Siemens systems)**

1. **Orientation:** Straight sagittal
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 will result and the study cannot be processed.** Please see the images below and use as a guide to correctly position the acquisition box.

## **I. Scan #6: Proton Density/T2-Weighted Fast Spin Echo**

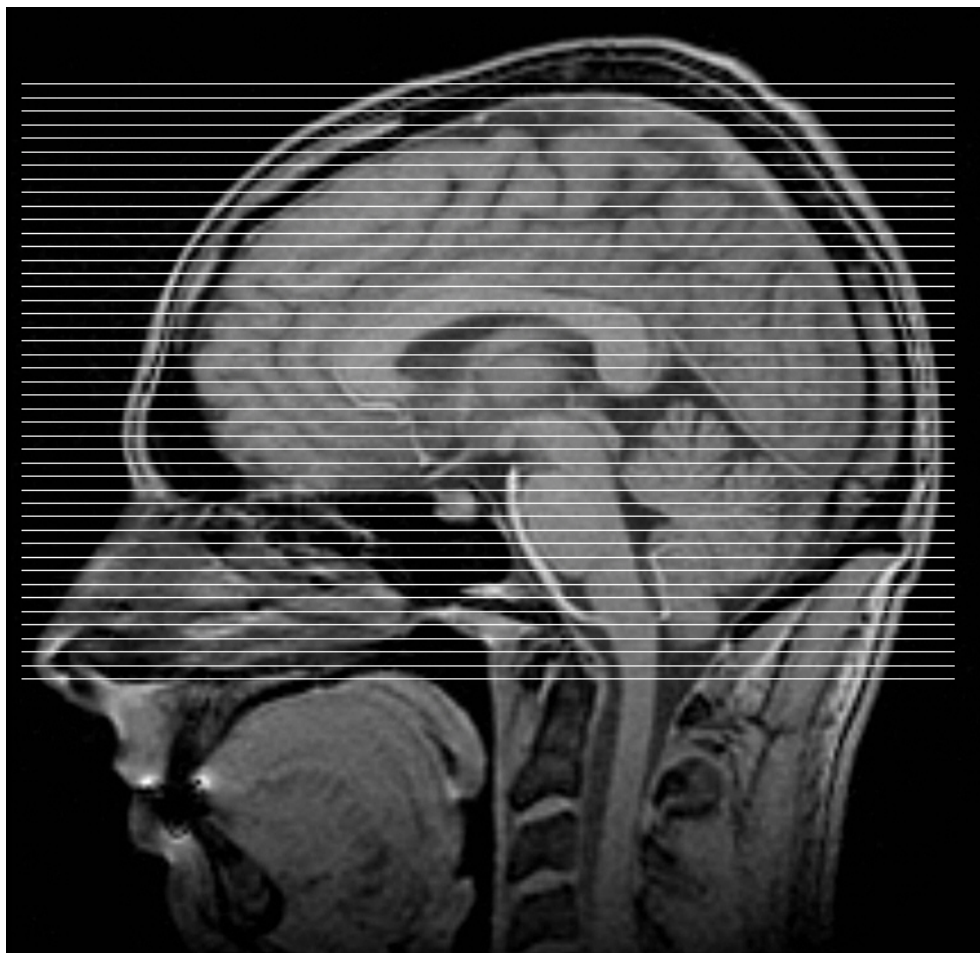
**Please Note:** Your MRI scanner vendor (GE, Siemens, or Phillips) will be supplying electronic protocols (WIPs) for installation by your local service engineer for your specific MRI system(s). This will ensure that you have the correct protocol for your MRI scanner.

If you have any questions about this procedure please contact: [ADNIMRI@Mayo.edu](mailto:ADNIMRI@Mayo.edu)

**Use only the imported ADNI sequences.**

Please see Appendix 3 for a detailed description of the spin echo sequence electronically loaded onto your MRI scanner.

1. **Orientation:** Straight Axial, prescribe slices inferior to superior.
2. **Positioning:** Position on mid-sagittal slice from tri-planar scout. Make sure to get full BRAIN coverage. 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.



## **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 MRI Scan Worksheet. The comments sections should include the reason the subject was unable to complete the MRI.

## **B. Clinical Reads**

1. **Every subject for the ADNI *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 for the ADNI 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. This is not to be confused with the repeat MP-RAGE.
  - b. Mayo QC will check all ADNI scans to be sure the correct, electronically loaded sequences have been used to scan each subject. Repeat exams may also be required if the incorrect scan sequence, orientation, or angulations are used. It is imperative to use the ADNI approved acquisition sequence with every ADNI 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 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, each site is **required** to perform *on going* quality control scans on the ADNI phantom using the ADNI protocol immediately following each subject scan.

**IMPORTANT:** If a site fails to perform these phantom scans and they have not been performed within 24 hours, the ADNI will not accept or reimburse the subject scan. The study coordinator and the principal investigator at each site will be notified if a phantom scan has not been received with each subject scan and you may be asked to bring the subject back for a re-scan.

### **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 **after each and every subject scan.**

**Please Note:** Your MRI scanner vendor (GE, Siemens, or Phillips) 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](mailto:adnimri@mayo.edu)  
**Use only the imported ADNI sequences.**

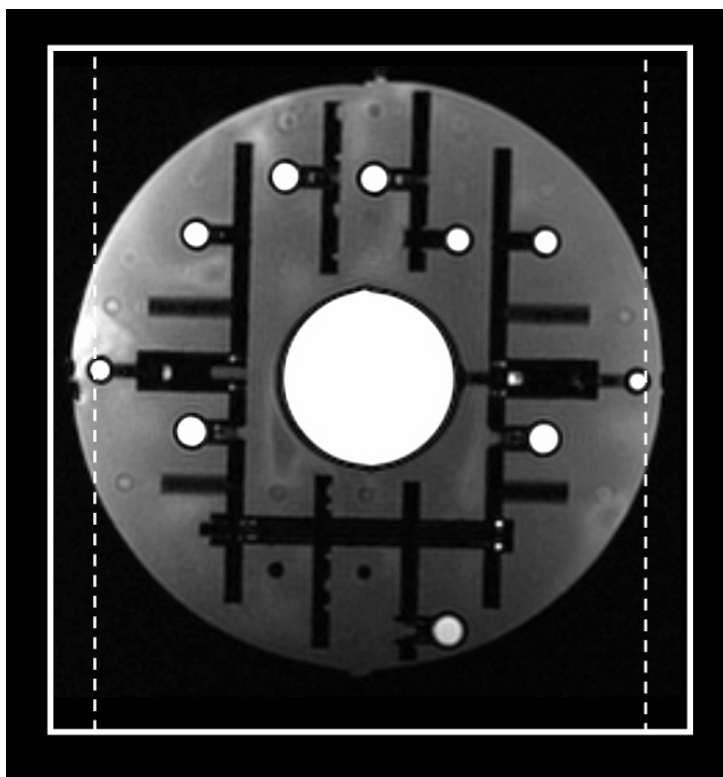
#### ***On Going QC Phantom Scan Protocol:***

##### **Phantom Scan Sequences:**

- 1) Localizer
- 2) Straight Sagittal MP-RAGE (slice thickness should cover entire phantom)

1. Once the subject scan is completed, register the phantom as a new exam.
2. **Localizer** - Please run a localizer to be sure the phantom is positioned correctly in the head coil.
3. **Sagittal MP-RAGE** - The on-going quality control MP-RAGE is identical to the subject MP-RAGE except for in some cases, 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.*

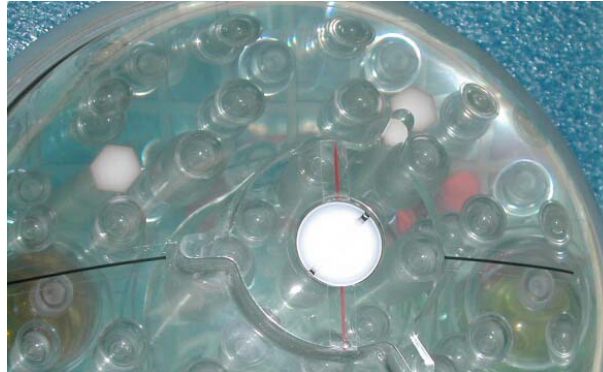
***Phantom Positioning:***

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 after each ADNI subject that is imaged. We hope that 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 on. 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.

**MRI Screening Form**  
**Alzheimer's Disease Neuroimaging Initiative MRI Study**  
**Alzheimer's Disease Cooperative Study (ADCS)**

Date \_\_\_/\_\_\_/\_\_\_ Participant Code \_\_\_\_\_

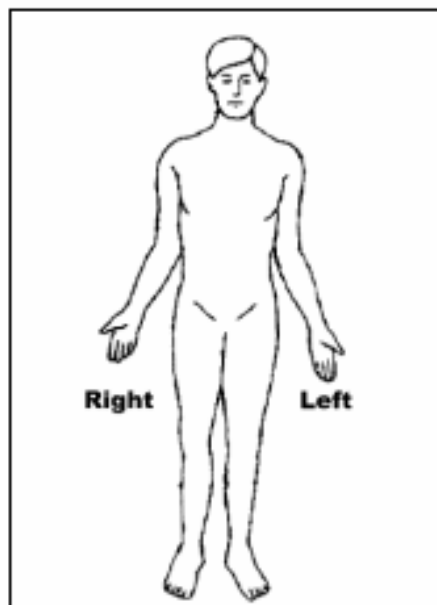
**Please check Yes/No for each of the following:**

Yes  No Previous MRI scan

**Exclusionary Items:**

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

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



**Please Inform MRI Center:**

- Yes  No Prosthesis or implant
- Yes  No Aortic Clip(s)
- 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
- 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)

*Remove all metallic objects prior to your MRI examination*

**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 participant or participant's representative

\_\_\_\_\_  
Name of Representative

\_\_\_\_\_  
Signature of person administering screening form

Date \_\_\_/\_\_\_/\_\_\_

## **Appendix 2: MRI Scan Information Log**

- The “MRI Scan Information Log” should be completed at the time of acquisition for every ADNI subject. A copy of the 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 - Execution Phase (ADNI)**  
**1.5T MRI Scan Information**

Participant:   
Participant ID

Visit: Screening Visit

To be completed by Study Coordinator:

Site Code: \_\_\_\_\_  
Study Coordinator Name: \_\_\_\_\_  
Telephone #: \_\_\_\_\_  
ADNI Participant Initials: \_\_\_\_\_

Anticipated Date of MRI Scan \_\_\_\_/\_\_\_\_/\_\_\_\_  
To be completed by MRI Technologist: (If section above is incomplete please contact study coordinator for subject information)

Important: It is mandatory that the ADNI site qualified scanner be used for all participants in the ADNI study. It is also mandatory that the same ADNI approved sequences are used at all ADNI scans.

MRI Operator Initials

Scan Date

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Month	Day	Year				

Please follow instructions in the ADNI Technical Manual for positioning the participant in the head coil. Please Stereotactic Marker on the patients (RT) temple.

1. Tri-Planar Scout (if available, otherwise use an axial scout)  
*\*\*Check participant positioning in the head coil, reposition and re-scout if necessary*

Scout - Completed?  
 Yes  
 No

Comments

2. Straight Sagittal MPRAGE Sequence  
*\*\*Please position the acquisition box to contain the whole brain and skull. Studies without full brain coverage cannot be processed. Please review the scan for motion and other artifacts. Please re-acquire if necessary.*

MPRAGE - Completed?  
 Yes  
 No

Comments

3. Repeat Straight Sagittal MPRAGE Sequence  
*\*\*Repeat of Scan 2 unless a change is required to adjust for correct coverage. Repeat*

MPRAGE - Completed?  
 Yes  
 No

Comments



**ADNI - Execution Phase (ADNI)**  
**1.5T MRI Scan Information**

Participant:

Participant ID

Visit: Screening Visit

4. B1 Calibration Head Coil Scan (Only applicable for phased array head coil on GE and Siemens systems)

Comments

*\*\*Please position the acquisition box to contain the whole brain and skull. Studies without full brain coverage cannot be processed. Please review the scan for motion and other artifacts. Please re-acquire if necessary.*

B1 Calibration (Head) - Completed?

- Yes  
 No

5. B1 Calibration Body Coil Scan (Only applicable for phased array head coil on GE and Siemens systems)

Comments

*\*\*Please position the acquisition box to contain the whole brain and skull. Studies without full brain coverage cannot be processed. Please review the scan for motion and other artifacts. Please re-acquire if necessary.*

B1 Calibration (Body) - Completed?

- Yes  
 No

6. Straight Axial Fast or Turbo Spin Echo

Comments

*\*\*Please position the acquisition stack to contain the whole brain from below cerebellum through top of head. Completed?*

- Yes  
 No

7. In new exam; Perform ADNI QC Scan. Localizer and Straight Sagittal MPRAGE (with increased slice thickness to ensure phantom coverage)

Comments:

ADNI QC Scan - Completed?

- Yes  
 No

8. Data Transfer and Local Data Archive:

Was data transferred to LONI within 24 hours of scan?

*Data must be transmitted to LONI within 24 hours of the MRI scan. If your site is unable to complete the transfer within 24 hours please indicate the problem in the "Comments" section below.*

- Yes  
 No

Transfer Date

Month Day Year

ADNI - Execution Phase (ADNI)

**1.5T MRI Scan Information**

Participant:

Participant ID

Visit: Screening Visit

Comments

Data Archived Locally

*If No, please explain under comments.*

Yes

No

Archive Medium

Comments

## 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](mailto: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/>

### **Scan #1: Triplanar**

### **Scan #2: Volumetric 3D T1-weighted MP-RAGE**

### **Scan #3: Repeat Volumetric 3D T1-weighted MP-RAGE**

### **Scan #4: B1 Calibration Head Coil Scan: (Only applicable for phased array head coil on GE and Siemens systems)**

### **Scan #5: B1 Calibration Head Coil Scan: (Only applicable for phased array head coil on GE and Siemens systems)**

### **Scan #6: Proton Density/T2-weighted Spin echo (Fast/Turbo)**

### **Phantom Scans:**

### **Scan #1: Triplanar**

### **Scan #2: Volumetric 3D T1-weighted MP-RAGE**

## **Appendix 4: ADNI Acquisition Troubleshooting Guide**

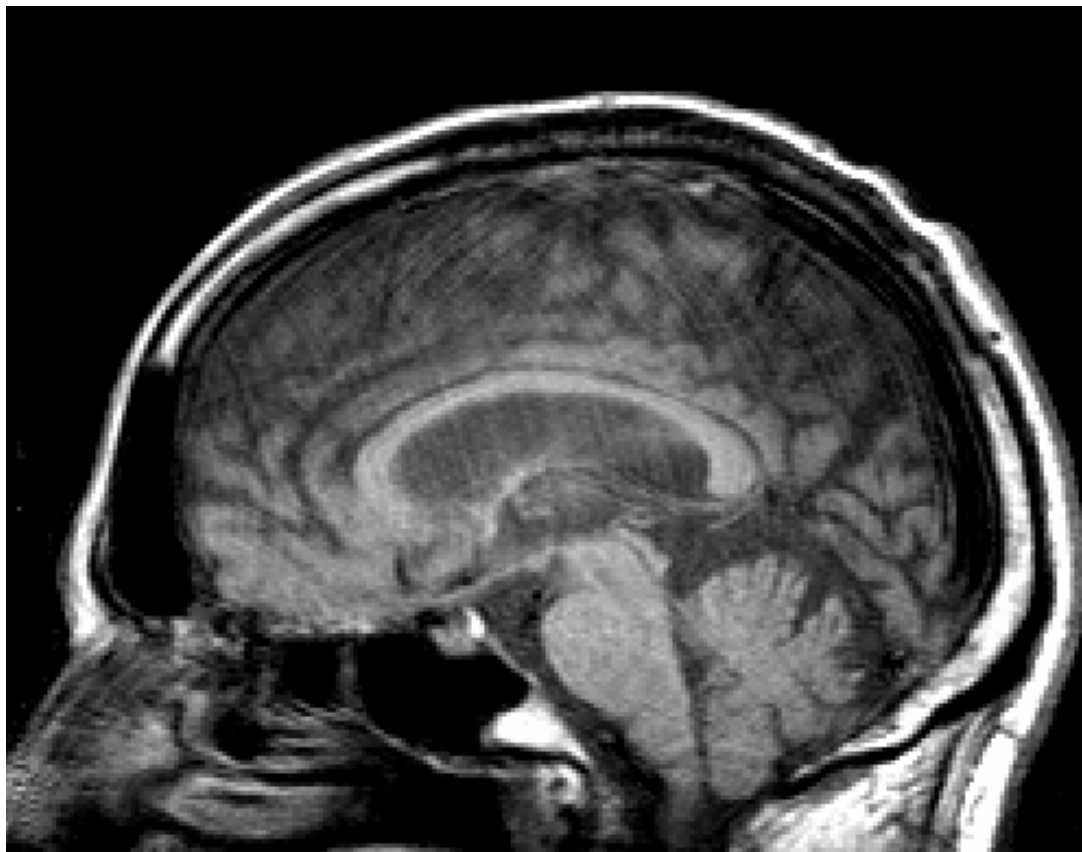
Superior image quality is imperative to the success of the ADNI study. Every effort should be made to acquire excellent scans on ADNI subjects at their first MRI appointment and at all subsequent visits. This prevents the clinical centers from rescheduling additional repeat MRI's for subjects.

It should also be noted that the T1 acquisition sequence is the most important sequence in the ADNI. 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 (DSE, etc.).

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](mailto:ADNIMRI@Mayo.edu) for specific technical questions or concerns outside the scope of this manual.

## T1-Weighted 3D Imaging

### 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 T1 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



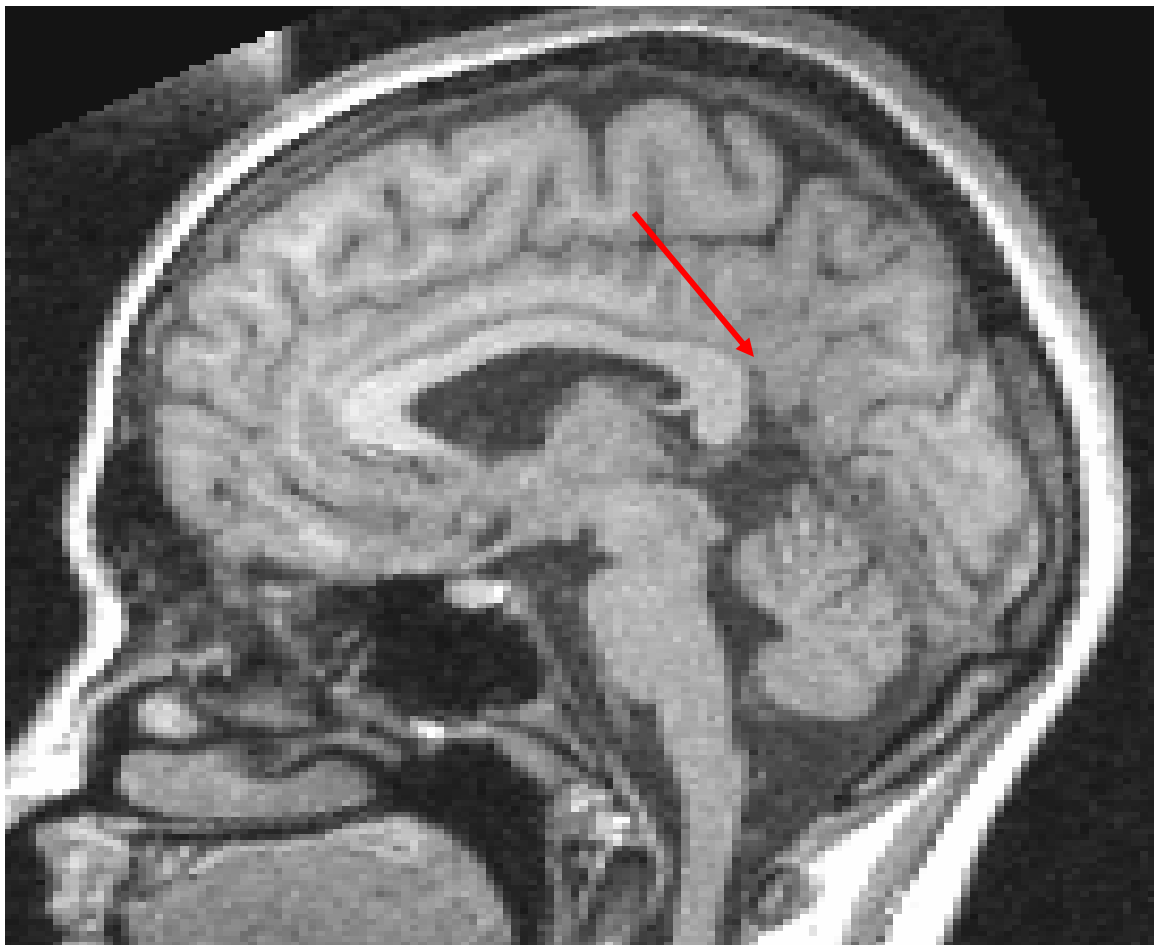
#### **Problem:**

In this example, wrap around occurs in the T1 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. If the acquisition box does not fully cover the subject's head (including the nose), increase the FOV and increase the number of phase encoding steps accordingly so as not to change the pixel resolution of the image.
2. Reposition the T1 acquisition box to cover the entire head (including the nose) and rescan.

### Example 3: Low Signal to Noise



**Problem:**

In this example, the image has low signal to noise. Please note the lack of contrast between gray and white matter as well as the high noise signal in the background of the image. Acquisitions with low SNR, especially due to incorrect sequence parameters, will not be accepted and a repeat scan will be requested.

**Possible Remedies:**

1. Pre-scan again
2. Check pulse sequence parameters
3. Make sure head coil is properly secured.

#### Example 4: 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 5: Metal Artifact



**Problem:**

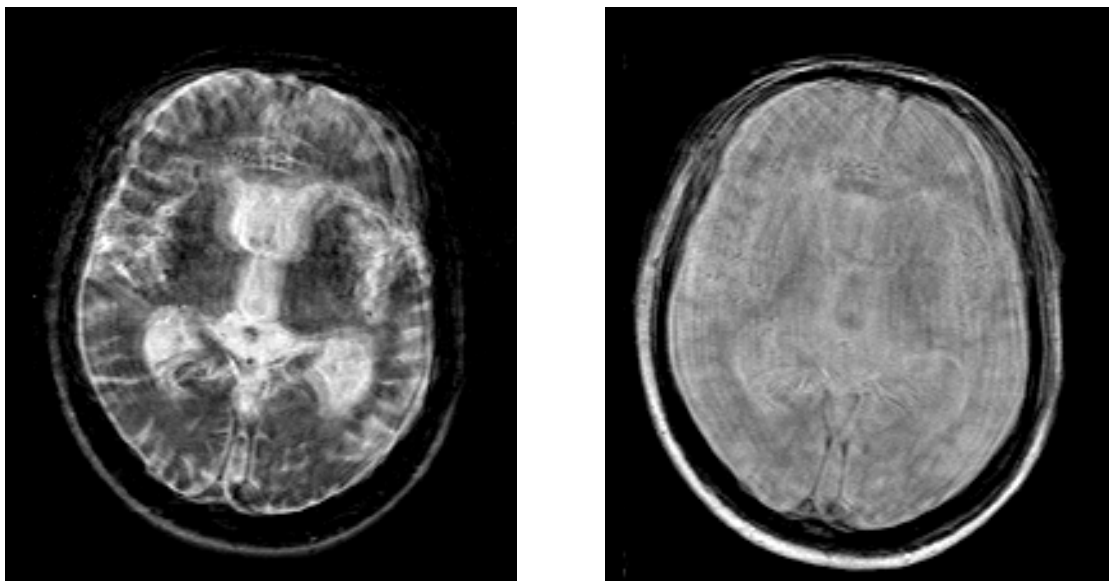
Magnetic field distortions: In this example there is blacking out due to the presence of metal near the subject's head. Acquisitions with metal artifact will not be accepted under any circumstances and a repeat scan will be requested.

**Possible Remedy:**

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.

## **Spin Echo Imaging**

### **Example 1: Image Degradation due to Motion Artifact**



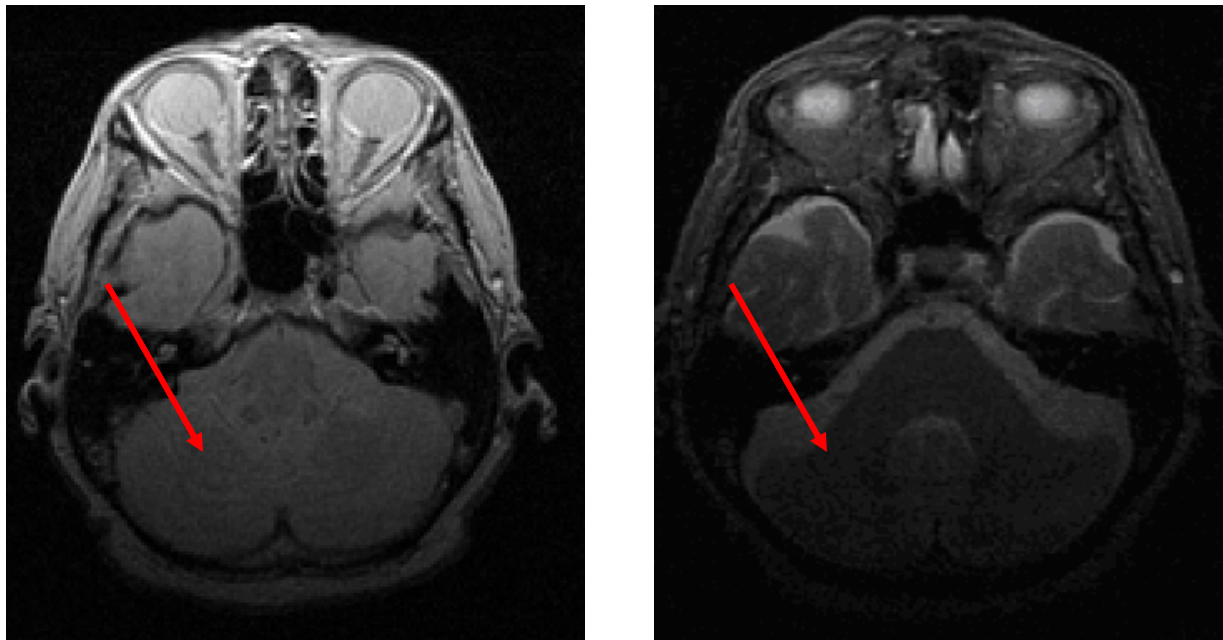
**Problem:**

In this example, movement has caused motion artifacts on the spin echo image. Acquisitions with major motion artifacts will not be accepted and a repeat scan may be requested.

**Possible Remedies:**

1. If motion is due to the subject's head moving, reacquire scan after tightly securing the subject's head with additional restraints and discussions with subject to hold their head still.
2. 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: Signal Loss at the Inferior Portion of the Brain



#### **Problem:**

In this example, the image has a loss of signal on the inferior slices of the brain due to incorrect positioning in the head coil. The subject was placed too low in the head coil. Please note the lack of contrast between gray and white matter on the most inferior slices of brain. 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.

## **Appendix 5: Data Transfer to Laboratory of Neuro Imaging (LONI)**

### **LONI Laboratory of Neuro Imaging Image Archive Data Instructions**

#### **CONTENTS:**

- A - Image Data Archive Overview
- B - System Requirements
- C - User Registration
- D - IDA Log in
- E - Query and Download Instructions
- F - Image Archive Overview
- G - Archive Instructions for Original Headered Files
- H - Archive Instructions for Limited Headered Files
- I - Archive Instructions for Synthetic Data

## 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](mailto:adni@loni.ucla.edu)

## B - SYSTEM REQUIREMENTS

The IDA requires a newer web browser (IE, Netscape, Mozilla) with the Java 1.4.2 (or higher) plug-in.

## C - USER REGISTRATION

1. From the ADNI home page at <http://www.loni.ucla.edu/ADNI/> click the data management link.



### GOAL

The Alzheimer's Disease Neuroimaging Initiative (ADNI) is a 5-year public-private partnership to test whether serial magnetic resonance imaging (MRI), positron emission tomography (PET), other biological markers, and clinical and neuropsychological assessment can be combined to measure the progression of mild cognitive impairment and early Alzheimer's disease. There are three major goals of ADNI. The first goal is to develop improved methods, that will lead to uniform standards for acquiring longitudinal, multi-site MRI and PET data on patients with Alzheimer's disease, mild cognitive impairment, and elderly controls. The second goal is to create a generally accessible data repository that describes longitudinal changes in brain structure and metabolism while acquiring clinical, cognitive and biomarker data for validation of imaging surrogates. The final goal is to determine those methods, that provide maximum power to determine treatment effects in trials involving these patient groups. It is expected that ADNI will provide extensive new data concerning the natural history of brain changes which occur during the transition from normal aging to MCI to AD that can be used for future design and power of clinical trials and extensive information about the relationship between brain imaging changes and changes in biomarkers obtained from blood and CSF.

[READ MORE ABOUT ADNI](#) ...

[↑ Back to Top](#)

### IN THIS SECTION:

[About ADNI](#)

[Research](#)

[Data Management](#)

[Billboard](#)

[Contacts](#)

[January 30 Steering Committee Meeting](#)



2. Click the Login button to archive files or query the database.

**ADNI** Alzheimer's Disease Neuroimaging Initiative

HOME ABOUT ADNI RESEARCH DATA MANAGEMENT BILLBOARD LONI HOME

LONI > ADNI

## Data Management

**DATA ARCHIVE** [LOG IN](#)

The LONI data archive provides an integrated environment for safely archiving, querying and visualizing imaging data utilizing a web-browser interface. The archive protects data from unauthorized access while providing the ability to share data among collaborative investigators. The various components of the data archive are described in the following sections.

**ARCHIVE**

The archival process involves de-identifying the header file and securely transmitting the image data from the local site to LONI. The purpose of de-identification is to remove or replace any fields in the header file that have to do with the identity of the subject, such as the Patient Name and ID fields.

**DATABASE QUERIES**

The query interface allows individuals to browse archived data at varying levels, according to their role within the project. Those with sufficient authorization may view, download and create collections of images.

[Follow this link for up-to-date statistics on archived images](#)

**IN THIS SECTION:**

- [DOJ Protection of Human Subjects](#)
- [DHHS Privacy Rule](#)
- [Subject Privacy Links \(PDF\)](#)
- [LONI Policy \(PDF\)](#)
- [IDA Instruction Manual](#)

**RELATED SITES:**

- [ADCS Database](#)

3. Click "Please follow this link to setup your account" to complete the user registration.

**LONI** Laboratory of Neuro Imaging, UCLA

HOME ABOUT LONI RESEARCH VISUALIZATION NEWS & EVENTS

LONI > About LONI > Resources

## Image Data Archive - Sign In

**RETURNING USERS SIGN IN**

E-mail

Password

[Forgot your password?](#)

[SIGN-IN](#)

Java 1.4.2 plugin is required.

**NEW USERS**

Create a new account.  
[Please follow this link to setup your account](#)

Benefits:

- Establish an account to create access to web resources
- Highly secure and very convenient

**BENEFITS**

- De-identification**  
Addresses government regulations for protection of human subject privacy
- Data Transmission**  
Data is transmitted over the internet using Hyper-Text Transfer Protocol with SSL encryption (HTTPS)
- Storage**  
Data is archived on a fault-tolerant storage area network (SAN), providing near 24/7 availability

**RELATED LINKS**

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

**OVERVIEW**

The LONI Image Data Archive was constructed to provide a simple, yet effective means of securely storing neuroimaging data on the LONI storage network. The easy-to-use web browser interface provides complete data de-identification and data transmission functionality. The Java applet that performs data de-identification travels to the user's local workstation where the de-identification process occurs. This approach ensures that no identifiable patient information crosses the network. The user may review the results of the de-identification process prior to initiating data transmission, further ensuring the integrity of the data.

The **LONI Image Data Archive System** provides a secure system for the archival of collaborator collected image data, ensuring confidentiality, and restricting access to authorized users. Read our [Privacy Notice](#).

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4. Complete the New Account form then press the Register button. Notify the LONI administrator ([adni@loni.ucla.edu](mailto:adni@loni.ucla.edu) or [dba@loni.ucla.edu](mailto:dba@loni.ucla.edu)) when you have registered so your access level can be set. You will receive an e-mail when this process is complete (within one business day).

The screenshot shows the LONI website's registration page. At the top, there is a navigation bar with the LONI logo and the text 'Laboratory of Neuro Imaging, UCLA'. A search bar is located in the top right corner. Below the navigation bar, there are links for HOME, ABOUT LONI, RESEARCH, VISUALIZATION, and NEWS & EVENTS. The main heading is 'LONI > Create New Account'. The form is divided into two sections: 'SETUP NEW ACCOUNT' and 'PERSONAL INFORMATION'. The 'SETUP NEW ACCOUNT' section contains two input fields: 'Type in your E-mail address\*' and 'Type in a user name\*'. Below the second field, it says 'If you have a LONI account use your LONI user name'. The 'PERSONAL INFORMATION' section contains several input fields: 'First Name\*', 'Last Name\*', 'Institution / Company\*', 'Department\*', 'Zip / Postal Code\*', 'Country\*', and 'If you have a website, please enter the URL here'. A note below these fields states: 'Once you click Register, we'll send you an e-mail message containing your temporary password.' Below the form, there is a line of text: 'BY CONTINUING, YOU ARE AGREEING TO THE LONI TERMS OF USE' followed by a 'REGISTER' button. At the bottom of the page, there is a footer with the text '© 2004 LONI. All rights reserved.' and links for 'TERMS OF USE', 'SITEMAP', and 'CONTACT'.

## D – IDA LOG IN

From the ADNI home page <http://www.loni.ucla.edu/ADNI/Data/index.shtml>, 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.

**LONI** Laboratory of Neuro Imaging, UCLA

HOME ABOUT LONI RESEARCH VISUALIZATION NEWS & EVENTS

LONI > About LONI > Resources

### Image Data Archive - Sign In

RETURNING USERS SIGN IN

E-mail

Password

Forgot your password?

Java 1.4.2 plugin is required.

**NEW USERS**

Create a new account  
Please follow this link to setup your account

Benefits:

- Establish an account to create access to web resources
- Highly secure and very convenient

**BENEFITS**

- De-identification**  
Addresses government regulations for protection of human subject privacy
- Data Transmission**  
Data is transmitted over the internet using Hyper-Text Transfer Protocol with SSL encryption (HTTPS)
- Storage**  
Data is archived on a fault-tolerant storage area network (SAN), providing near 24/7 availability

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The **LONI Image Data Archive System** provides a secure system for the archival of collaborator collected image data, ensuring confidentiality, and restricting access to authorized users. Read our [Privacy Notice](#).

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From the IDA Menu page, click the Query button to view or download images, or the Archive Files button to upload images to the data archive.

**LONI** Laboratory of Neuro Imaging, UCLA

HOME ABOUT LONI RESEARCH VISUALIZATION NEWS & EVENTS

LONI > About LONI > Resources

### IDA Data Management Menu

Select an option from the menu below or click Logout to end your session.

Select QUERY to access the query interface, view images, form collections of images or download images.

Select ARCHIVE to upload new images into the Image Data Archive.

**RELATED LINKS**

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

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## E - QUERY AND DOWNLOAD INSTRUCTIONS

**Overview:** The query interface allows the user to search for images based on subject and image-related criteria, view images, form image collections and download images in a number of file formats.



There are two ways to access the query interface:

E1) From the ADNI Data Management page, <http://www.loni.ucla.edu/ADNI/Data/index.shtml>, click the Login In button. On the IDA Data Management Menu, click on Archive Files.

On the "Archive and Review" page, click the Query button.

**PROJECT INFORMATION:**

Select Project:

You can de-identify and archive files for the project and site shown above by selecting the ARCHIVE FILES button, query the database by clicking the QUERY button below, or review previously uploaded files in the VIEW RECENTLY ARCHIVED VOLUMES section below.

**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.

**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
UTHC_0181	T2W FSE	160	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0181	3D GRE	190	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0181	PDW FSE	160	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0180	T2W FSE	146	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0180	3D GRE	190	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0180	PDW FSE	146	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0179	T2W FSE	158	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0179	3D GRE	190	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0179	PDW FSE	158	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0178	T2W FSE	160	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>

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E2) From the ADNI Data Management page, <http://www.loni.ucla.edu/ADNI/Data/index.shtml>, click the Login button. Enter your e-mail address and password, and then click the Sign-In button.

On the IDA Data Management Menu page, click on the Query button.

1. To perform a query, enter search criteria in the fields provided, and then click the "Search" button. Data can be queried based on a combination of subject- and image-related attributes.

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## Image Database Search

[LEGEND: Projects](#) | [Research Groups](#) | [Modalities](#) | [Help](#) | [View Collections](#) LOG OUT

Enter your selection criteria using the form below.

SUBJECT INFORMATION	IMAGE INFORMATION
<b>Subject ID:</b> <input type="text"/> <small>Leave blank unless searching for a specific subject.</small> <b>Sex:</b> <input type="text" value="Both"/> <b>Age:</b> <input type="text" value="-"/> <input type="text" value=""/> <input type="text" value=""/> <small>Years</small> <b>Weight:</b> <input type="text" value="-"/> <input type="text" value=""/> <input type="text" value=""/> <small>Kg</small>	<b>Modality:</b> <input type="text" value="MRI"/> <b>Series Description:</b> <input type="text"/> <b>Weighting:</b> <input type="text" value="Select Value"/> <b>Pulse Sequence:</b> <input type="text" value="Select Value"/> <b>Slice Thickness:</b> <input type="text" value="-"/> <input type="text" value=""/> <input type="text" value=""/> <small>mm</small> <b>Acquisition Plane:</b> <input type="text" value="Select Value"/> <div style="text-align: right;"><input type="button" value="RESET"/></div>
Aggregate Results:	Search Results:
<b>Group By:</b> <input type="text"/> <input type="text"/> <small>and</small> <input type="text"/>	<b>Order By:</b> <input type="text"/> <input type="text"/> <small>and then by:</small> <input type="text"/>
<input type="button" value="AGGREGATE"/>	<input type="button" value="SEARCH"/>

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2. Query results can be either aggregated and grouped or individually displayed and ordered as shown below.

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### Image Database Search Results

LEGEND: Projects | Research Groups | Modalities | Help | View Collections

72 image sets match your criteria: Sex = M, Modality = MRI, Weighting = T1.

Your access level: Member (CBM, SFC)  
Access to data is controlled by each project's leader. Click the Projects link above for additional information.

Subject	Species	Project	Research Group	Sex	Age	Modality	Series Description	View*	Select
3_S_547162	Human	SFC	Control	M	0.6	MRI	3DSPGR	VIEW	<input type="checkbox"/>
3_S_622255	Human	SFC	Control	M	0.6	MRI	3DSPGR	VIEW	<input type="checkbox"/>
3_S_623166	Human	SFC	Control	M	0.6	MRI	3DSPGR	VIEW	<input type="checkbox"/>
					0.6	MRI	talback T1	VIEW	<input type="checkbox"/>
					1.0	MRI	3DSPGR	VIEW	<input type="checkbox"/>
3_S_658300	Human	SFC	Control	M	0.5	MRI	3DSPGR	VIEW	<input type="checkbox"/>
3_S_826113	Human	SFC	Control	M	0.5	MRI	3DSPGR	VIEW	<input type="checkbox"/>
					1.0	MRI	3DSPGR	VIEW	<input type="checkbox"/>
3_S_827145	Human	SFC	Control	M	0.5	MRI	3DSPGR	VIEW	<input type="checkbox"/>
3_S_831296	Human	SFC	Control	M	0.5	MRI	3DSPGR	VIEW	<input type="checkbox"/>
3_S_913340	Human	SFC	Control	M	0.5	MRI	3DSPGR	VIEW	<input type="checkbox"/>
4_S_101093	Human	SFC	Control	M	0.6	MRI	GE 3D T1W	VIEW	<input type="checkbox"/>

To select an individual data set, click the corresponding select box or click here to select all data sets:

Previous 1 2 3 4 5 6 Next

NEW SEARCH ADD TO COLLECTION

\*Clicking the view icon launches the LONI Image Viewer. The viewer requires a Java-enabled browser with [Java Plug-in 1.4.2](#) or newer installed.

3. Users may form collections of images for downloading. To create a collection, click the select box beside the desired image(s), and then click the “Add to Collection” button. When prompted, enter the collection name. A new window displaying the data collection will open. To download images, select the desired files and click the “Download” button.

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### Image Database Collection

LEGEND: Projects | Research Groups | Modalities | Help | View Collections

Collection	Subject ID	Group	Sex	Age	Modality	Sequence	Format	Downloaded	View*	Select
sfc_sample	3_S_132977	Control	F	0.6	MRI	3-pl T2* FGRE S	DICOM	7/28/2004	VIEW	<input type="checkbox"/>
	3_S_150146	Control	F	0.5	MRI	3DSPGR	DICOM		VIEW	<input type="checkbox"/>
	3_S_359112	Control	F	0.6	MRI	3DSPGR	DICOM		VIEW	<input type="checkbox"/>

To select an individual data set, click the corresponding select box or click here to select all data sets:

Previous 1 Next

REGROUP DELETE DOWNLOAD

\*VIEWING: Clicking the view icon launches the LONI Image Viewer. The viewer requires a Java-enabled browser with [Java Plug-in 1.4.2](#) or newer installed.  
\*DOWNLOADING: Select desired file format then click the Download button. All selected files will be downloaded into a single directory.

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## F – IMAGE ARCHIVE 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.

### 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 ADNI Data Management page <http://www.loni.ucla.edu/ADNI/Data/index.shtml>. 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.

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### Image Data Archive - Sign In

**RETURNING USERS SIGN IN**

E-mail:

Password:

Forgot your password?

Java 1.4.2 plugin is required.

**NEW USERS**

Create a new account  
Please follow this link to setup your account

**Benefits:**

- Establish an account to create access to web resources
- Highly secure and very convenient

**BENEFITS**

- De-identification**  
Addresses government regulations for protection of human subject privacy
- Data Transmission**  
Data is transmitted over the internet using Hypertext Transfer Protocol with SSL encryption (HTTPS)
- Storage**  
Data is archived on a fault-tolerant storage area network (SAN), providing near 24/7 availability

**RELATED LINKS**

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

**OVERVIEW**

The LONI Image Data Archive was constructed to provide a simple, yet effective means of securely storing neuroimaging data on the LONI storage network. The easy-to-use web browser interface provides complete data de-identification and data transmission functionality. The Java applet that performs data de-identification travels to the user's local workstation where the de-identification process occurs. This approach ensures that no identifiable patient information crosses the network. The user may review the results of the de-identification process prior to initiating data transmission, further ensuring the integrity of the data.

The **LONI Image Data Archive System** provides a secure system for the archival of collaborator collected image data, ensuring confidentiality, and restricting access to authorized users. Read our [Privacy Notice](#).

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

The screenshot shows the LONI Laboratory of Neuro Imaging, UCLA website. The header includes the LONI logo and a search bar. A navigation menu contains links for HOME, ABOUT LONI, RESEARCH, VISUALIZATION, and NEWS & EVENTS. The main content area is titled "IDA Data Management Menu" and includes a breadcrumb trail: LONI > About LONI > Resources. Below the title, there is a "LOG OUT" button and a "SELECT AN OPTION" prompt. Two menu items are listed: "QUERY" (for accessing the query interface) and "ARCHIVE FILES" (for uploading new images). To the right, a "RELATED LINKS" section contains links to DOJ Protection of Human Subjects, DHHS Privacy Rule, LONI De-Identification Policy, and LONI Policy (PDF). The footer contains copyright information and links for TERMS OF USE, SITEMAP, and CONTACT.

### **G - ARCHIVE INSTRUCTIONS FOR ORIGINAL HEADERED FILES (DICOM)**

The Archive and Review page is the starting point for uploading new images. The bottom portion of the page lists the last 10 images uploaded by the user.

**SYSTEM REQUIREMENTS:** The IDA requires a newer web browser (IE, Netscape, Mozilla) with the Java 1.4.2 (or higher) plug-in.

#### **ASSUMPTIONS FOR MRI:**

The image data is in DICOM format.

All image files are in a single directory per subject.

An empty directory exists for holding the de-identified files.

On the "Archive and Review" page, select your Project/Site from the drop down menu and click the "Archive Files" button. Do not open multiple IDA browser windows while archiving data.

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## Archive and Review

LOG OUT

**PROJECT INFORMATION:**

Select Project:

You can de-identify and archive files for the project and site shown above by selecting the ARCHIVE FILES button, query the database by clicking the QUERY button below, or review previously uploaded files in the VIEW RECENTLY ARCHIVED VOLUMES section below.

QUERY

**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.

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

ARCHIVE FILES

**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.

REFRESH

Subject ID	Series Description	No. of Images	Date ▲	View	Download
UTHC_0181	T2W FSE	160	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0181	3D GRE	190	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0181	PDW FSE	160	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0180	T2W FSE	146	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0180	3D GRE	190	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0180	PDW FSE	146	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0179	T2W FSE	158	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0179	3D GRE	190	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0179	PDW FSE	158	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>
UTHC_0178	T2W FSE	160	Tue, 12/14/2004	<input type="button" value="VIEW"/>	<input type="button" value="DOWNLOAD"/>

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**Step 1:**  
Select the data type: choose **Original**.

Complete the required information on the De-Identify page, making sure that a proper research identifier is supplied for the subject, then click the De-Identify button.

Choosing “Bypass Validation Steps” allows you to skip the validation of header attributes, and upload all series without further interaction, however the browser must remain open for the duration of the upload process.

Note: The directory containing the original data files may contain multiple series, however, all data within the directory must be from a single subject. The target directory, for holding the de-identified files must be empty.

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De-identify

**STEP ONE: DE-IDENTIFY**  
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 then complete the form entries.
- The Subject ID entered below replaces the existing Patient ID in the image file(s). It is recommended that the user keep a separate cross reference of original and replacement subject identifiers.
- Choose source directory (directory in which the original files are located & containing only image files).
- Choose target directory (an empty directory which will contain the new, de-identified files).
- Click the De-identify button to begin de-identification process.
- Check the Bypass validation steps checkbox, to upload files without validating.

**PLEASE FOLLOW THE INSTRUCTIONS OUTLINED ABOVE:**

Project ADNI@UCLA

Select Data Type  Original  Synthetic  Derived  Bypass Validation steps

Research Group Patient

Visit Number  Max. 3 characters allowed

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 that are considered headered (DICOM, GE, etc) may contain multiple series from a single subject. Source Directory for headerless file formats (TIFF, TGA, etc) may contain a single series for a single subject and must have a file name which contains a slice or sequence number (eg subject100\_niss1\_001.TIFF). ANALYZE files are assumed to be in SPM orientation.

CANCEL DE-IDENTIFY

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**Step 2:**

When the de-identification step is finished, a listing of the image series is shown along with information about the de-identified files.

Results of the de-identification can be viewed by scrolling down in the De-Identified Metadata window. After reviewing the metadata, de-select any series that should not be archived (scouts, etc). To compress files, click the associated checkbox (compressing files will speed the upload process for computers with slower network connections). Click the Submit button to archive the de-identified images or Discard to cancel the upload and return to the previous page.

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## Verify & Submit Data

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.

- 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 don't want submitted (such as a localizer or scout).
- Click the SUBMIT button to start the data transmission process.

**IN THIS SECTION:**

- [1: De-Identify](#)
- [2: Verify & Submit Data](#)**
- [3: Confirmation](#)

**DE-IDENTIFIED FILES:**

Subject ID	Sequence Name	Number of Images	Selected
t	Brain DUALTSE	1	<input checked="" type="checkbox"/>

DISCARD
SUBMIT
 Compress files before transmitting

**REVIEW DE-IDENTIFIED HEADER INFORMATION:**

```

LONI De-Identified File Attributes

Series Description: Brain      DUAL/TSE
Series ID: 17.7759990692138_2Af0oD0JHLDGrRbRuJfY8v.COEnhLd3gmz1DUc12yguBvJXwq
X:\TestData\DICOM\Philips\anon_shots\17.7759990692138_2Af0oD0JHLDGrRbRuJfY8v.

Metadata for DICOM file ADNI_t_MR_Brain_____DUAL_TSE_br_20050224181610004_1

Tag      Tag Description              Tag Value
00020000 Group Length.          42
00020001 File Meta Information Version.  0001
00020010 Transfer Syntax UID.         1.2.840.10008.1.2.1
00080000 Group Length.             356
00080005 Specific Character Set.      ISO_IR 100
00080008 Image Type.                ORIGINAL PRIMARY M_SE M SE
00080018 SOP Instance UID.          2.16.124.113543.6006.99.08376001318
00080020 Study Date.                 20040928
        
```



**Step 3:**

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

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**Confirmation**

IN THIS SECTION:  
1: De-Identify  
2: Verify & Submit Data  
3: **Confirmation**

**3**

**CONFIRMATION**  
The files listed below have been transmitted to the LONI Archive.

- Please print and retain the LogFile specified in the TRANSMISSION RESULTS window.
- To archive additional image data, click the ARCHIVE MORE button.
- To complete the data archival process, click the LOGOUT button.

**TRANSMISSION RESULTS**

Progress: 100%

Your Connection Speed: 488.0 KB/s

Modem	DSL	T1	LAN
Uploading file 1/2 PAD_PAD_0003_MRI_T1-FFE_br_200502241753544444.img ... Completed at 8 KB/s. Uploading file 2/2 PAD_PAD_0003_MRI_T1-FFE_br_200502241753544444.img ... Completed at 488 KB/s. Thu Feb 24 17:56:23 PST 2005 Finished upload at 488.0 KB/s.			

Review Uploaded Files ARCHIVE MORE CANCEL

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## H - ARCHIVE INSTRUCTIONS FOR LIMITED HEADER FILES (Analyze, Minc)

1. On the "Archive and Review" page, select your Project/Site from the drop down Menu and click the "Archive Files" button. Do not open multiple IDA browser Windows while archiving data.

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## Archive and Review

LOG OUT

---

**PROJECT INFORMATION:**

Select Project:

You can de-identify and archive files for the project and site shown above by selecting the ARCHIVE FILES button, query the database by clicking the QUERY button below, or review previously uploaded files in the VIEW RECENTLY ARCHIVED VOLUMES section below.

QUERY

**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.

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

ARCHIVE FILES

**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.

REFRESH

Subject ID	Series Description	No of Images	Date ▲	View	Download
UTHC_0181	T2W FSE	160	Tue, 12/14/2004	VIEW	DOWNLOAD
UTHC_0181	3D GRE	190	Tue, 12/14/2004	VIEW	DOWNLOAD
UTHC_0181	PDW FSE	160	Tue, 12/14/2004	VIEW	DOWNLOAD
UTHC_0180	T2W FSE	146	Tue, 12/14/2004	VIEW	DOWNLOAD
UTHC_0180	3D GRE	190	Tue, 12/14/2004	VIEW	DOWNLOAD
UTHC_0180	PDW FSE	146	Tue, 12/14/2004	VIEW	DOWNLOAD
UTHC_0179	T2W FSE	158	Tue, 12/14/2004	VIEW	DOWNLOAD
UTHC_0179	3D GRE	190	Tue, 12/14/2004	VIEW	DOWNLOAD
UTHC_0179	PDW FSE	158	Tue, 12/14/2004	VIEW	DOWNLOAD
UTHC_0178	T2W FSE	160	Tue, 12/14/2004	VIEW	DOWNLOAD

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**Step 1:**  
Select the data type: choose **Original**.

Complete the required information on the De-Identify page, making sure that a proper research identifier is supplied for the subject, then click the De-Identify button.

Choosing “Bypass Validation Steps” allows you to skip the validation of header attributes, and upload all series without further interaction, however the browser must remain open for the duration of the upload process.

Note: The directory containing the original data files may contain multiple series, however, all data within the directory must be from a single subject. The target directory, for holding the de-identified files must be empty.

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## De-identify

---

1

**STEP ONE: DE-IDENTIFY**

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 then complete the form entries.
- The Subject ID entered below replaces the existing Patient ID in the image file(s). It is recommended that the user keep a separate cross reference of original and replacement subject identifiers.
- Choose source directory (directory in which the original files are located & containing only image files).
- Choose target directory (an empty directory which will contain the new, de-identified files).
- Click the De-identify button to begin de-identification process.
- Check the Bypass validation steps checkbox, to upload files without validating.

**IN THIS SECTION:**

- 1: De-Identify
- 2: Verify & Submit Data
- 3: Confirmation

**PLEASE FOLLOW THE INSTRUCTIONS OUTLINED ABOVE:**

Project

Select Data Type  Original  Synthetic  Derived  Bypass Validation steps

Research Group

Visit Number  Max. 3 characters allowed

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

Source Directory:    
Location of original files

Target Directory:    
Location for target files

NOTE: Source Directory for file formats that are considered headered (DICOM, GE, etc) may contain multiple series from a single subject. Source Directory for headerless file formats (TIFF, TGA, etc) may contain a single series for a single subject and must have a file name which contains a slice or sequence number (eg subject100\_niss1\_\_001.TIFF). ANALYZE files are assumed to be in SPM orientation.

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**Step 1A:**

Define the study. Select the imaging modality from the drop-down menu and provide the study information. Click the "Submit Data" button when finished.

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## Define Study

**IN THIS SECTION:**

- [1: De-Identify](#)
- [2: Verify & Submit Data](#)
- [3: Confirmation](#)

**1A**

**STEP 1A: DEFINE STUDY**  
The define study process lets you add data to an existing study or describe a new study.

- Select imaging modality from the drop down menu.
- Select an existing study or
- Add a new study by describing new study attributes and clicking the SUBMIT DATA Button.

**SELECT MODALITY:**

Modality

**DEFINE A NEW STUDY:**

Study Date  YYYY-MM-DD

Subject Age  Years

Subject Weight  kg

Post Mortem

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**Step 1B:**

Enter the Image Metadata, then click the Submit Data button to initiate the De-identification process.



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## Image Metadata

**IN THIS SECTION:**

**1B**

**STEP 1B: IMAGE METADATA**

The image metadata process lets you describe the data you are submitting to the LONI Archive for storage.

- Select values from the drop down menus below.
- Click the SUBMIT DATA button to start the data transmission process.

[1: De-Identify](#)

[2: Verify & Submit Data](#)

[3: Confirmation](#)

**REQUIRED INFORMATION:**

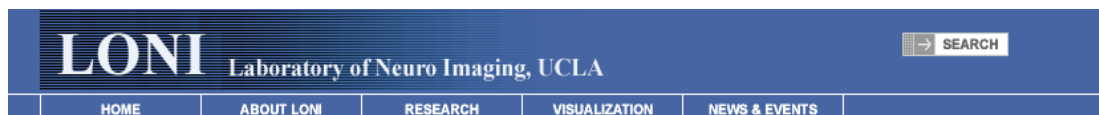
Sequence Name	<input type="text"/>	<input type="checkbox"/> Use Series Description from file.
Weighting	Select Value	Select Other to type in.
Slice Thickness mm	Select Value	Select Other to type in.
Acquisition Plane	Select Value	
Manufacturer	Select Value	Select Other to type in.
Mfg Model	Select Value	Select Other to type in.
Field Strength tesla	Select Value	Select Other to type in.

**MR ACQUISITION:**

Acquisition type	Select Value	
Pulse Sequence	Select Value	Select Other to type in.
TE ms	Select Value	Select Other to type in.
TR ms	Select Value	Select Other to type in.
T1 ms	Select Value	Select Other to type in.
Coil	Select Value	Select Other to type in.
Flip Angle degree	Select Value	Select Other to type in.

## Step 2:

When the de-identification step is finished, a listing of the image series is shown along with information about the de-identified files. Results of the de-identification can be viewed by scrolling down in the De-Identified Metadata window. After reviewing the metadata, de-select any series that should not be archived (scouts, etc). To compress files, click the associated checkbox (compressing files will speed the upload process for computers with slower network connections). Click the Submit button to archive the de-identified images or Discard to cancel the upload and return to the previous page.



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## Verify & Submit Data

### IN THIS SECTION:

- [1: De-Identify](#)
- [2: Verify & Submit Data](#)**
- [3: Confirmation](#)

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.

- 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 don't 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
t	Brain DUALTSE	1	<input checked="" type="checkbox"/>

Compress files before transmitting

**REVIEW DE-IDENTIFIED HEADER INFORMATION:**

LONI De-Identified File Attributes  
 Series Description: Brain DUAL/TSE  
 Series ID: 17.7759990692138\_2Af0oD0JHLDGrRbRuJfY8v.COehjLd3gmz1DUc12yguBvJXwq  
 X:\TestData\DICOM\Philips\anon\_shots\17.7759990692138\_2Af0oD0JHLDGrRbRuJfY8v.

Metadata for DICOM file ADNI\_t\_MR\_Brain\_\_\_\_\_DUAL\_TSE\_br\_20050224181610004\_1

Tag	Tag Description	Tag Value
00020000	Group Length.	42
00020001	File Meta Information Version.	0001
00020010	Transfer Syntax UID.	1.2.840.10008.1.2.1
00080000	Group Length.	356
00080005	Specific Character Set.	ISO_IR 100
00080008	Image Type.	ORIGINAL PRIMARY M_SE M SE
00080018	SOP Instance UID.	2.16.124.113543.6006.99.08376001318
00080020	Study Date.	20040928

**Step 3:**

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

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## Confirmation

**IN THIS SECTION:**

- 1: De-Identify
- 2: Verify & Submit Data
- 3: Confirmation**

**3**

**CONFIRMATION**  
The files listed below have been transmitted to the LONI Archive.

- Please print and retain the LogFile specified in the TRANSMISSION RESULTS window.
- To archive additional image data, click the ARCHIVE MORE button.
- To complete the data archival process, click the LOGOUT button.

**TRANSMISSION RESULTS**

**Progress:** 100% **Your Connection Speed:** 488.0 KB/s

Modem	DSL	T1	LAN
Uploading file 1/2 PAD_PAD_0003_MRI_T1-FFE_br_20050224175354444.img ... Completed at 8 KB/s.			
Uploading file 2/2 PAD_PAD_0003_MRI_T1-FFE_br_20050224175354444.img ... Completed at 488 KB/s.			
Thu Feb 24 17:56:23 PST 2005 Finished upload at 488.0 KB/s.			

[Review Uploaded Files](#) [ARCHIVE MORE](#) [CANCEL](#)

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## I - ARCHIVE INSTRUCTIONS FOR SYNTHETIC DATA

Synthetic data can be uploaded only when the image(s) from which the synthetic image was created have already been uploaded to the LONI archive.

1. On the "Archive and Review" page, select your Project/Site from the drop down Menu and click the "Archive Files" button. Do not open multiple IDA browser windows while archiving data.

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## Archive and Review

[LOG OUT](#)

---

**PROJECT INFORMATION:**

Select Project:

You can de-identify and archive files for the project and site shown above by selecting the ARCHIVE FILES button, query the database by clicking the QUERY button below, or review previously uploaded files in the VIEW RECENTLY ARCHIVED VOLUMES section below.

[QUERY](#)

**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.

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

[ARCHIVE FILES](#)

**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.

[REFRESH](#)

Subject ID	Series Description	No of Images	Date ▲	View	Download
UTHC_0181	T2W FSE	160	Tue, 12/14/2004	<a href="#">VIEW</a>	<a href="#">DOWNLOAD</a>
UTHC_0181	3D GRE	190	Tue, 12/14/2004	<a href="#">VIEW</a>	<a href="#">DOWNLOAD</a>
UTHC_0181	PDW FSE	160	Tue, 12/14/2004	<a href="#">VIEW</a>	<a href="#">DOWNLOAD</a>
UTHC_0180	T2W FSE	146	Tue, 12/14/2004	<a href="#">VIEW</a>	<a href="#">DOWNLOAD</a>
UTHC_0180	3D GRE	190	Tue, 12/14/2004	<a href="#">VIEW</a>	<a href="#">DOWNLOAD</a>
UTHC_0180	PDW FSE	146	Tue, 12/14/2004	<a href="#">VIEW</a>	<a href="#">DOWNLOAD</a>
UTHC_0179	T2W FSE	158	Tue, 12/14/2004	<a href="#">VIEW</a>	<a href="#">DOWNLOAD</a>
UTHC_0179	3D GRE	190	Tue, 12/14/2004	<a href="#">VIEW</a>	<a href="#">DOWNLOAD</a>
UTHC_0179	PDW FSE	158	Tue, 12/14/2004	<a href="#">VIEW</a>	<a href="#">DOWNLOAD</a>
UTHC_0178	T2W FSE	160	Tue, 12/14/2004	<a href="#">VIEW</a>	<a href="#">DOWNLOAD</a>

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**Step 1:**

Select the data type: choose **Synthetic**.

Complete the required information on the De-Identify page, making sure that a proper research identifier is supplied for the subject, then click the De-Identify button. Make sure that a research identifier for a previously archived subject is supplied. Specify the source and target directories. Click the De-Identify button.

Choosing “Bypass Validation Steps” allows you to skip the validation of header attributes, and upload all series without further interaction, however the browser must remain open for the duration of the upload process.

Note: The directory containing the original data files may contain multiple series, however, all data within the directory must be from a single subject. The target directory, for holding the de-identified files must be empty.

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## De-identify

**1** **STEP ONE: DE-IDENTIFY**  
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 then complete the form entries.
- The Subject ID entered below replaces the existing Patient ID in the image file(s). It is recommended that the user keep a separate cross reference of original and replacement subject identifiers.
- Choose source directory (directory in which the original files are located & containing only image files).
- Choose target directory (an empty directory which will contain the new, de-identified files).
- Click the De-identify button to begin de-identification process.
- Check the Bypass validation steps checkbox, to upload files without validating.

**IN THIS SECTION:**

- [1: De-Identify](#)
- [2: Verify & Submit Data](#)
- [3: Confirmation](#)

**PLEASE FOLLOW THE INSTRUCTIONS OUTLINED ABOVE:**

Project ADNI@UCLA

Select Data Type  Original  Synthetic  Derived  Bypass Validation steps

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 that are considered headered (DICOM, GE, etc) may contain multiple series from a single subject. Source Directory for headerless file formats (TIFF, TGA, etc) may contain a single series for a single subject and must have a file name which contains a slice or sequence number (eg subject100\_niss1\_001.TIFF). ANALYZE files are assumed to be in SPM orientation.

CANCEL DE-IDENTIFY

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**Step 1A:**

Select the image modality from the drop-down menu. Choose the sequence from which the synthetic image was created by clicking the select box beside the sequence.

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## Define Study

1A

**STEP 1A: DEFINE STUDY**

The define study process lets you add data to an existing study or describe a new study.

- Select imaging modality from the drop down menu.
- Select an existing study or
- Add a new study by describing new study attributes and clicking the SUBMIT DATA Button.

IN THIS SECTION:

- [1: De-Identify](#)
- [2: Verify & Submit Data](#)
- [3: Confirmation](#)

SELECT MODALITY:

Modality MRI

EXISTING STUDIES:

Sequences	Study Date	Subject Age	→	SELECT
MEDIC-Hi Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
MEDIC-Hi Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
T1-3D-FLASH - 20 Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
MEDIC-Lo Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
MEDIC-Lo Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
MEDIC-Lo Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
MEDIC-Lo Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
MEDIC-Lo Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
MEDIC-Lo Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
MEDIC-Lo Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
TSE 2D (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
T1-3D-FLASH - 5 Flip (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
B1-calibration - Head Coil (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT
B1-calibration - Head Coil (Coil: PA; 1.5T)	2005-01-06	73.0	→	SELECT

**Step 1B:**

Change metadata (if necessary) and enter a sequence name **or** click the “Use Series Description from file” checkbox to use the series description in the file header. Click the Submit Data button to initiate the de-identification.



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## Image Metadata

**IN THIS SECTION:**

### 1B

**STEP 1B: IMAGE METADATA**

The image metadata process lets you describe the data you are submitting to the LONI Archive for storage.

**1: De-Identify**

[2: Verify & Submit Data](#)

[3: Confirmation](#)

- Select values from the drop down menus below.
- Click the SUBMIT DATA button to start the data transmission process.

**REQUIRED INFORMATION:**

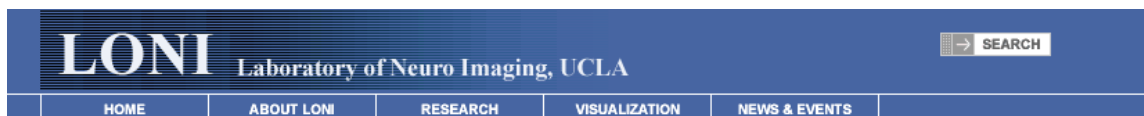
Sequence Name	<input type="text"/>	<input type="checkbox"/> Use Series Description from file.
Weighting	T1 <input type="text"/>	T1 <input type="text"/>
Slice Thickness mm	Other <input type="text"/>	1.2 <input type="text"/>
Acquisition Plane	SAGITTAL <input type="text"/>	
Manufacturer	SIEMENS <input type="text"/>	SIEMENS <input type="text"/>
Mfg Model	Symphony <input type="text"/>	Symphony <input type="text"/>
Field Strength tesla	Other <input type="text"/>	1.494 <input type="text"/>

**MR ACQUISITION:**

Acquisition type	3D <input type="text"/>
Pulse Sequence	GR <input type="text"/>
TE ms	Other <input type="text"/>
TR ms	Other <input type="text"/>
TI ms	Other <input type="text"/>
Coil	Other <input type="text"/>
Flip Angle degree	20 <input type="text"/>
Scan Type	S <input type="text"/>

**Step 2:**

When the de-identification step is finished, a listing of the image series is shown along with information about the de-identified files. Results of the de-identification can be viewed by scrolling down in the De-Identified Metadata window. To compress files, select the associated checkbox (compressing files will speed the upload process for computers with slower network connections). Click the Submit button to archive the de-identified images or Discard to cancel the upload and return to the previous page.



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## Verify & Submit Data

**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 don't 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
t	Brain DUALTSE	1	<input checked="" type="checkbox"/>

Compress files before transmitting

**REVIEW DE-IDENTIFIED HEADER INFORMATION:**

```

LONI De-Identified File Attributes

Series Description: Brain      DUAL/TSE
Series ID: 17.7759990692138_2Af0oD0JHLDGrRbRuJfY8v.COEHjLd3gmz1DUc12yguBvJXwq
X:\TestData\DICOM\Philips\anon_shots\17.7759990692138_2Af0oD0JHLDGrRbRuJfY8v.

Metadata for DICOM file ADNI_t_MR_Brain_____DUAL_TSE_br_20050224181610004_1

Tag      Tag Description              Tag Value
00020000 Group Length.                42
00020001 File Meta Information Version.  0001
00020010 Transfer Syntax UID.          1.2.840.10008.1.2.1
00080000 Group Length.                356
00080005 Specific Character Set.        ISO_IR 100
00080008 Image Type.                  ORIGINAL PRIMARY M_SE M SE
00080018 SOP Instance UID.             2.16.124.113543.6006.99.08376001318
00080020 Study Date.                   20040928
    
```

**Step 3:**

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

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**Confirmation**

IN THIS SECTION:

1: De-Identify  
2: Verify & Submit Data  
3: **Confirmation**

**3**

**CONFIRMATION**  
The files listed below have been transmitted to the LONI Archive.

- Please print and retain the LogFile specified in the TRANSMISSION RESULTS window.
- To archive additional image data, click the ARCHIVE MORE button.
- To complete the data archival process, click the LOGOUT button.

**TRANSMISSION RESULTS**

Progress: 100%

Your Connection Speed: 488.0 KB/s

Modem	DSL	T1	LAN
Uploading file 2/2 PAD_PAD_0003_MRI_T1-FFE_br_20050224175354444.img ...			
Completed at 8 KB/s.			
Uploading file 2/2 PAD_PAD_0003_MRI_T1-FFE_br_20050224175354444.img ...			
Completed at 488 KB/s.			
Thu Feb 24 17:56:23 PST 2005 Finished upload at 488.0 KB/s.			

Review Uploaded Files ARCHIVE MORE CANCEL

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