Standardized Centralized Alzheimer's and Related Dementias Neuroimaging (SCAN)

MRI Checklist, QuickStart Guide, Manual

Document Status: Final
Document Revision Number: 1.9
Date: 23 June 2023
Standardized Centralized Alzheimer's and Related Dementias Neuroimaging (SCAN)

SCAN MRI Checklist
SCAN MRI Checklist

About this checklist: This checklist is designed to serve as a roadmap for MRI Scanner Approval and for uploading MRI data according to the SCAN protocol.

Step 1. Identify SCAN MRI liaison(s) responsible for study oversight

- **Description of SCAN MRI liaison role**
  - Respond to queries from the SCAN team
  - Responsible for SCAN MRI Imaging at enrolling site
  - Maintain current list of site contacts for imaging site
  - Ensure protocol compliance (regulatory/imaging)

Step 2. Submit SCAN MRI site information

- **Submit site and contact information for your SCAN MRI liaison and other relevant team members at your site via this form:** [Site Information Form]
  - Identify who will serve as the SCAN MRI liaison for your ADRC
  - All site contacts for imaging site (Technologists/Uploaders/PI’s)

Step 3. Prepare to participate in the SCAN Study

- **Ensure regulatory compliance and institutional approval for external data sharing**
  (see Section 4.1 for more information)

- **Certify your MRI Scanner**
  - **Select a scanning option**
    - Review MRI scanning options 1 and 2 (see Protocols in Quick Start Guide for more information) and determine which MRI scanner(s) will be used for the study at your site
    - Submit MRI scanner(s) information and scanning option selection to SCANmri@mayo.edu.
  - **Receive and implement MRI protocol**
    - Once your MRI scanner and options are received by email at SCANmri@mayo.edu, you will be emailed the appropriate electronic MRI protocol file and instructions for certification from SCAN MRI Core at Mayo Clinic (SCANmri@mayo.edu)
    - Load electronic protocol onto your selected MRI scanner(s)
    - Perform certification scan on MRI phantom (see Section 2 for more information)
    - Upload images to SCANQUAL project using LONI uploader (see Section 8 for more information)
    - Email SCANmri@mayo.edu to alert them that upload of certification images is complete
    - Receive MRI Certification letter from SCAN MRI Core at Mayo Clinic
Step 4. Collect and upload participant data according to the SCAN protocol used for certification of your MRI Scanner

- **Identify participants that are eligible for the study**
  - All participants must have
    - been IRB consented (see Section 4.1 for more information)
    - a NACC ID - *Note - If the participant does not have an assigned NACC ID, data upload will not be accepted*
    - been scanned after January 1, 2021
    - MRI data that will be collected according to SCAN standards.
      - (Sites must use electronic protocols provided/approved by SCAN MRI Core – these will be emailed to you by SCANmri@mayo.edu after you have completed checklist step 3 above)

- **Collect participant images**
  - Schedule SCAN compliant imaging session
    - Ensure previously approved electronic MRI protocol file will be used
  - MRI Technologists acquires images

- **Upload participant images to SCAN project on LONI**
  - Review upload portion of MRI Manual
  - Begin upload, fill out metadata form associated with upload on LONI, and complete upload
    - After images are uploaded, you will be transferred to the Image Upload Metadata form through the LONI web interface
      - (See a Metadata Form example)
      - Complete a metadata form
  - Ensure all images are uploaded (check confirmation page following upload)

- **Questions and troubleshooting**
  - Question/Issues with MRI can be directed to
    - SCANmri@mayo.edu
  - Question/Issues related to LONI upload can be directed to
    - data.coordinator@loni.usc.edu
Standardized Centralized Alzheimer's and Related Dementias Neuroimaging (SCAN)

SCAN Quick Start Guide
CONTACT INFORMATION FOR THE SCAN STUDY

If you have any questions or concerns regarding MRI imaging, please contact the Mayo Clinic Aging and Dementia Imaging Research (ADIR) Laboratory:

SCANmri@mayo.edu

If you have any questions or concerns regarding the scan uploading to LONI, please contact:

data.coordinator@loni.usc.edu

MRI SCANNER/SITE QUALIFICATION

Prior to any SCAN participants being imaged, the site’s scanner must complete MRI Site Qualification. In most cases, for MRI systems that have been qualified for ADNI or similar studies, site qualification will only involve scanning a phantom with the electronically provided SCAN sequences, which will be provided by the Mayo Clinic ADIR Lab. For new sites or scanners not involved in the ADNI or similar studies, qualification will require scanning the complete protocol on a consented volunteer.

PROTOCOLS

There are two protocol options for SCAN – each site can choose which they prefer:

**Option 1:** MRI site only required to do two SCAN sequences:

1. Accelerated Sagittal 3D T1 Weighted Sequence (ADNI3 Sequence)
2. Accelerated Sagittal 3D FLAIR Sequence (ADNI4 Sequence)

In this case, the first two scans (approximately 12 minutes of imaging time) would belong to SCAN, then remainder time imaging would be unique at each site.

**Option 2:** MRI site performs the full SCAN protocol (ADNI4) or a subset of the full protocol that includes T1, FLAIR and one or more of the additional series below:

1. 3 Plane/Tri-Planar Scout/Calibration Scan
2. Accelerated Sagittal 3D T1 Sequence
3. Compressed Sagittal 3D T1 Sequence (where applicable)
4. Sagittal 3D FLAIR Sequence
5. Sagittal 3D T2 Weighted Sequence
6. Axial 2D/3D ME T2 GRE Sequence
7. Axial DTI PA Sequence (Multiband if applicable)
8. Axial DTI AP Sequence (where applicable - Multiband if applicable)
9. Axial fcMRI Sequence (Multiband if applicable)
10. Axial 3D pCASL – Axial 3D PASL Sequences (multiple series)
11. Accelerated High Resolution Hippocampus Scan (Oblique** – perpendicular to hippocampal tail)

**Except for the HRH sequence, all scans should be scanned as straight axial or sagittal.**

Prior to scanning Option 2, all sites involved in the SCAN receive an electronic protocol for importation onto their MRI scanner and instructions for loading will be provided by the ADIR Lab. This will allow for all systems to have a uniform protocol loaded onto their system without the manual entering of parameters.
NOMENCLATURE

When entering information into the scanner console please use the following nomenclature:

**Phantom:** 1_P_0000 (Site ID*_P_Number) (Use this ID for upload to LONI as well)
**Volunteer:** 1_V_0000 (Site ID*_V_Number) (Use this ID for upload to LONI as well)

*Please note that there is no leading zeros in the site number.*

**Participant:** Use local *Participant ID or PTID.

*Participant ID or PTID (local Participant ID) is a sequence of up to 10 characters.

The participant ID or PTID is different from the NACC ID and is your ADRC-managed participant ID, or "local ID". *Formats vary by ADRC.*

As noted in Section 8, any fields that may contain participant information will be de-identified and rendered HIPAA compliant as part of the upload process via MRI Scan Upload to LONI.

UPLOAD OF DATA

Prior to uploading the qualification data to the SCAN Document Repository on LONI, your site will need to obtain access to the database through the LONI helpdesk: Detailed information on performing the upload can be found in section 2.6.

There are two projects on LONI for SCAN
SCAN (used for participant scans) and SCANQUAL (used for uploading qualification scans).

You can register for your scan account here:

https://ida.loni.usc.edu/home/projectPage.jsp?project=SCAN

or

https://ida.loni.usc.edu/services/NewUser.jsp?project=SCANQUAL

Then email data.coordinator@loni.usc.edu to have your permissions set for the appropriate projects.

*In addition to sending to LONI, please archive all sequences acquired using your site’s standard practice as well.*

DO YOU HAVE DATA ACQUIRED AFTER JANUARY 1, 2021 ON NACC PARTICIPANTS TO UPLOAD?

Make sure the participant is appropriate and the images have been acquired according to SCAN protocols. If so, please plan to send them to LONI as you would with any other participant.

QUESTIONS?

Questions about Uploading SCAN data: data.coordinator@loni.usc.edu

Technical/QC questions: SCANmri@mayo.edu

Questions/concerns regarding individual participants contact the study coordinator at your referral site.
Standardized Centralized Alzheimer's and Related Dementias Neuroimaging (SCAN)

SCAN MRI Procedures Manual
A. CONTACT INFORMATION FOR THE SCAN STUDY

If you have any questions or concerns regarding MRI imaging, please contact the Mayo Clinic Aging and Dementia Imaging Research (ADIR) Laboratory:

SCANmri@mayo.edu

If you have any questions or concerns regarding the scan uploading to LONI, please contact:

data.coordinator@loni.usc.edu

1. BACKGROUND AND SIGNIFICANCE OF THE SCAN STUDY

The goal of this study is to harmonize MR acquisitions across ADC sites to facilitate analyses of shared data.

2. SITE QUALIFICATION

2.1. Overview

Prior to any SCAN participants being imaged, the site’s scanner must complete MRI Site Qualification. In most cases, for MRI systems that have been qualified for ADNI or similar studies, site qualification will only involve scanning a phantom with the electronically provided SCAN sequences, which will be provided by the Mayo Clinic’s ADIR Lab. For new sites or scanners not involved in the ADNI or similar studies, qualification will require scanning the complete protocol on a consented volunteer.

2.2. Importing Electronic Protocols

Prior to scanning, all sites involved in the SCAN study will receive an electronic protocol for importation onto their MRI scanner. The file (Exam Card – Philips; Protocol Exchange – GE; or .exar file – Siemens) and instructions for loading will be provided by the ADIR Lab. This will allow for all systems to have a uniform protocol loaded onto their system without the manual entering of parameters.

NOTE: Only the scanner qualified for the SCAN study at your site should be used for ALL participant scans during the study. If the same MRI scanner is not used, the scan will fail and will need to be completed on the approved system unless change is pre-approved by MRI unit.

2.3. MRI Qualification Phantom Scan Instructions (Applicable to previously qualified ADNI or Similar study scanners)

For site qualification, the MR site must scan a phantom using the electronically loaded SCAN Human Scan protocols. (This can be done prior to IRB approval.)

- MRI qualification will consist of a complete scan of the entire human protocol done on any MRI phantom.
- No adjustments should be made to these protocols.

COIL Selection: Sites are encouraged to use their best coil available to them for participant scans and, thus, request site certification scans are done with that coil as well.
*NOTE: The ADNI Phantom may not fit in 64 or 32 channel head coils. Sites are instructed to use any spherical MRI phantom that does fit in their best coil.

Once the scan is received, the ADIR Lab QC team will review the scanned protocols for correct parameters, good image quality and scanner performance. This review will be completed within seven business days of receiving the data. If the scans do not pass ADIR Lab QC, the site will be asked to re-scan after making the suggested changes by the ADIR Lab QC team.

2.4. MRI Qualification Volunteer Scan Instructions
(Applicable to new scanners/sites not previously qualified for ADNI or similar studies)

If a site is using a new scanner that was not previously qualified for the ADNI or similar study, the ADIR Lab will require a site to acquire the SCAN sequences on a human volunteer to complete MRI certification. In this case, the site will be asked to scan the entire protocol on consented human volunteer(s) without modification.

Once the scan is received, the ADIR Lab QC team will review the scanned protocols for correct parameters, good image quality and scanner performance. This review will be completed within seven business days of receiving the data. If the scans do not pass ADIR Lab QC, the site will be asked to re-scan after making the suggested changes by the ADIR Lab QC team.

2.5. Nomenclature for Qualification Scans

When entering information into the scanner console please use the following nomenclature:

- **Phantom:** 1_P_0000 (Site ID_P_Number)
- **Volunteer:** 1_V_0000 (Site ID_V_Number)

*Please note that there is no leading zero in the site number.

2.6. Data Transfer of Qualification Scans

2.6.1. Upload of Qualification Scans

Prior to uploading the qualification data to the SCAN Document Repository on LONI, your site will need to obtain access to the database through the LONI helpdesk:

[https://ida.loni.usc.edu/services/NewUser.jsp?project=SCANQUAL](https://ida.loni.usc.edu/services/NewUser.jsp?project=SCANQUAL)

Please archive all sequences acquired for site certification using your site’s standard practice and upload via the LONI Image Repository ([Section 8](#)).

2.7. Site Certification Scan Results

The ADIR Lab QC team will perform a quality control check on the phantom and/or volunteer scan data within seven business days of data received. ADIR Lab QC team will determine if the correct parameters have been met and assure there are no other underlying problems seen during the scanning of these sessions. After successful qualification scanning and successful scan of the first participant, an official Site Certification e-mail will be sent to the SCAN study contacts notifying them their site has been approved and is ready to scan participants.
3. **ONGOING QUALITY CONTROL AND PHANTOM SCANS**

There are no ongoing quality control phantom scans for SCAN. The MRI site scanners will only be required to scan the MRI phantom at initial site qualification and again if there are scanner software and/or hardware upgrades.

Please see instructions for scanning the phantom in the MRI Site Qualification, Section 2.3.

3.1. **Hardware and Software Upgrades**

To avoid any delays or mistakes in scanning, the ADIR Lab QC team requires notification at least 2 weeks *PRIOR* to any software and/or hardware upgrades for any scanner involved in the SCAN imaging study so they can provide you the correct upgraded protocols if needed.

At the time of the MRI scanner upgrade, you will be required to scan a phantom prior to continue scanning study participants.

**IMPORTANT:**
If a site fails to perform these phantom scans and/or they have not been performed within 2 weeks of the upgrade, SCAN may not accept or reimburse the subsequent participant scans. The study coordinator and the principal investigator at the site will be notified if a phantom scan has not been received within that time frame.

If you have questions regarding this procedure, please contact: SCANmri@mayo.edu.

3.2. **Phantom Results and Site Notification**

The ADIR Lab QC team will examine each phantom data set to ensure that there are no underlying problems with the scanning session. Within seven business days of receiving the data, if there is an issue that needs to be addressed, an email will be sent notifying you of the problem.

4. **MRI PARTICIPANT PRE-SCAN PROCEDURES**

4.1. **Regulatory**

4.1.1. Sites are required to follow their local IRB study procedures.
4.1.2. Sites must have IRB approval before scanning any participants.
4.1.3. IRB must allow for approval to publicly share participant data.

4.2. **Participant Pre-screening**

All participants should have been screened by the consenting study coordinator for standard MRI contraindications. However, participants must be rescreened 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.

4.3. **Participant Safety and Monitoring**

1. All sites should follow the standard participant consent protocols as approved by your local IRB.
2. Explain the scan procedure to the participant so that they know what to expect during the MRI.
3. Please use universal MRI safety precautions. Make sure that participant 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.

4. Offer the participant hearing protection.

5. Please use standard local practice for monitoring the participant during the scan. These may include MRI safe devices to monitor pulse and O₂ levels.

4.4. Head Coil Selection

Sites are encouraged to use the best head coil available to them for participant scans. *(Typically, this is a 64 or 32 channel head coil for most Siemens and Philips sites.)*

4.5. Participant Positioning

1. Proper participant positioning is crucial for successful reproduction of serial MRI exams. Therefore, it is important that each participant is positioned in the same manner for each MRI exam.

2. Please follow the procedures below for positioning the participant in the head coil:
   - Besides standard room exclusions, ensure the participant 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.
   - Provide each participant with ear protection.
   - Position the participant 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 participant 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 participant 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 participant’s nasion *(directly between the eyebrows)* at every scanning session.
   - Center the head coil over the participant’s head, making sure the participant is high enough in the coil to prevent signal loss at the inferior aspect of the brain.
   - Offer each participant a panic button in case of emergencies or claustrophobia if common local practice at your facility (for example, a squeeze ball alarm).
   - Remind participant to hold as still as possible and advance the participant to the iso-center of the scanning bore.
5. MRI ACQUISITION SEQUENCES

5.1. MRI Human Brain Scan Sequences

SCAN Participant Scanning Sessions:

There are two protocol options for SCAN – each site can choose which they prefer:

Option 1: MRI site only required to do two SCAN sequences:

1. Accelerated Sagittal 3D T1 Weighted Sequence (ADNI3 Sequence)
2. Accelerated Sagittal 3D FLAIR Sequence (ADNI4 Sequence)

In this case the first 2 scans (approximately 12 minutes of imaging time) would belong to SCAN, then remainder time imaging would be unique at each site.

Option 2: MRI site performs the full SCAN protocol (ADNI4) or a subset of the full protocol that includes T1, FLAIR and one or more of the additional series below

1. 3 Plane/Tri-Planar Scout/Calibration Scan
2. Accelerated Sagittal 3D T1 Sequence
3. Compressed Sagittal 3D T1 Sequence (where applicable)
4. Sagittal 3D FLAIR Sequence
5. Sagittal 3D T2 Weighted Sequence
6. Axial 2D/3D ME T2 GRE Sequence
7. Axial DTI PA Sequence (Multiband if applicable)
8. Axial DTI AP Sequence (where applicable - Multiband if applicable)
9. Axial fcMRI Sequence (Multiband if applicable)
10. Axial 3D pCASL – Axial 3D PASL Sequences (multiple series)
11. Accelerated High Resolution Hippocampus Scan (Oblique** – perpendicular to hippocampal tail)

**Except for the HRH sequence, all scans should be scan as straight axial or sagittal.

Prior to scanning Option 2, all sites involved in the SCAN receive an electronic protocol for importation onto their MRI scanner and instructions for loading will be provided by the ADIR Lab. This will allow for all systems to have a uniform protocol loaded onto their system without the manual entering of parameters.
5.2. MRI Example Images

5.2.1. Human Scan Sequences - Image Examples

The following pages are example images of what will be acquired for the ADNI4 study, as well as positioning recommendations.

- If the participant is not positioned properly, please adjust the participant in the head coil and re-scout. Continue repositioning and scouting until the participant is correctly centered in the head coil.

3 Plane/Tri-Planar Scout/Calibration Scan

1. A quick acquisition in three 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 participant is positioned properly.

2. Proper placement of the participant’s head inside the head coil is crucial because scans are acquired straight, not in an oblique orientation.

3. If the participant is not positioned properly, please adjust the participant in the head coil and re-scout. Continue repositioning and scouting until the participant is correctly centered in the head coil.

Make sure participant 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 participant if necessary.
Accelerated Sagittal 3D T1 Weighted Sequence

Do Not Angle or change any parameters
- 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.

Compressed Accelerated Sagittal 3D T1 Weighted Sequence

Do Not Angle or change any parameters
- 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.

Accelerated Sagittal 3D FLAIR Sequence

Do Not Angle or change any parameters
- 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.
Sagittal 3D T2 Weighted Sequence

Example of Sagittal 3D T2 Weighted Sequence

Axial 3D ME T2 GRE / Axial 3D T2 GRE / Axial T2 Star / GRE

Example of an Axial 3D ME T2 GRE (SWI–Top – QSM-Below)

Example of Axial T2 star / GRE
Axial DTI PA Sequence (Multiband if applicable)

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.

Axial DTI AP Sequence (Multiband if applicable)

**Copy Ref (Slice/FOV Center) from previous DTI sequence. DO NOT Copy Phase Encoding
Double Check that Phase Encoding is set to AP prior to scanning.

Axial functional connectivity MRI (fcMRI) (Multiband if applicable)

Example of Axial functional connectivity MRI (fcMRI)
1. Participant should have eyes OPEN
2. Orientation: Straight Axial DO NOT Oblique Scans.
3. Participant Instruction: Please instruct the participant to keep their eyes open during the entire scan. You can instruct them to focus on a point on the mirror or scanner. Also remind the participants of the importance of holding their head still for the entire scan.

**Axial 3D pCASL – Axial 3D PASL (Arterial Spin Labeling)**

Example of ASL   From Vemuri et al, submitted
Accelerated High Resolution Hippocampus Scan (Oblique)

Example of High Resolution Hippocampus (HRH) Scan

Most Superior portion of the FOV should be placed so that top of the skull in included. Position the FOV so that it covers the entire Hippocampus from head to tail.
6. MRI PARTICIPANT SCAN PROCEDURES

6.1. Entering Participant Information into the Scanner

MRI sites are encouraged to enter the Participant ID or PTID (local Participant ID) in the Patient ID and Patient Name fields whenever possible, as described in Section 6.2. If this is not feasible, the technologist should enter the participant information into the scanner per the local site’s standard. The scan header will be de-identified and rendered HIPAA compliant as part of the upload process via MRI Scan Upload to LONI (Section 8).

6.2. Participant Anonymization Nomenclature

When uploading participant data for SCAN you will enter the Participant ID or PTID (local Participant ID) which is a sequence of up to 10 characters.

Please note that the participant ID or PTID is different from the NACC ID and is your ADRC-managed participant ID, or "local ID". Formats vary by ADRC.

PLEASE NOTE: If the participant does not have an affiliated NACCID** assigned to the Participant ID or PTID you entered, the upload will not be accepted.

**NACC ID - this is the NACC-managed participant ID. It is a string with the prefix ‘NACC’ followed by 6 digits

As noted in section 8, any fields that may contain participant information will be de-identified and rendered HIPAA compliant as part of the upload process via MRI Scan Upload to LONI.

6.3. Scan Discontinuation

If the participant 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 participant still does not want to complete the scan, then the MRI should be abandoned and an email should be sent to SCANmri@mayo.edu including the reason the participant was unable to complete the MRI.

6.4. On-Site Clinical Reads

Every participant must receive a local clinical read by an on-site radiologist or staff physician. The handling of the MR interpretation should follow standard local practice at the referral site. Scan interpretations for diagnostic clinical purposes will not be provided by the ADIR Lab (MRI Core) for SCAN.
6.5. Archive Procedures

Every MRI scan for the SCAN study must be archived following your site’s standard practice. Additional data transfers or copies may be requested in the event that a data transfer is interrupted or incomplete. Possible MRI archive mediums include:

- PACS

6.6. Request for Repeat/Additional MRI Scans

A request for a re-scan may be required in the event that the Axial T2 Star/GRE, Axial T2 FLAIR, and/or Sagittal 3D Accelerated MPRAGE/IRSPGR is found to be unacceptable due to participant motion or an incomplete/incorrect MRI acquisition.

The ADIR Lab QC team will check all SCAN scans to be sure that the exam was conducted on the site’s scanner qualified for the SCAN study, and that the correct electronically loaded sequences have been used to scan each participant. Repeat exams may also be required if the incorrect scan sequence, orientation, or angulations were used. It is imperative to use the SCAN approved acquisition sequence with every SCAN participant. Scans with image degradation due to the incorrect scan sequence, orientation, or angulations may not be reimbursed nor will scans acquired on any scanner other than the one qualified for SCAN without authorization of the MRI unit. Re-scans will be reimbursed if the correct scan sequence, orientation, and angulations were used.

7. MRI CONTACT INFORMATION

<table>
<thead>
<tr>
<th>ADIR Lab PI</th>
<th>Clifford R. Jack, M.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADIR Lab Project Manager</td>
<td>Denise Reyes</td>
</tr>
<tr>
<td>ADIR Lab MRI Technologist</td>
<td>Bret Borowski (<a href="mailto:borowski.bret@mayo.edu">borowski.bret@mayo.edu</a>)</td>
</tr>
<tr>
<td>ADIR Lab E-mail Address</td>
<td><a href="mailto:SCANmri@mayo.edu">SCANmri@mayo.edu</a></td>
</tr>
</tbody>
</table>
8. DATA TRANSFER INSTRUCTIONS

INTRODUCTION
This document provides instructions for account registration and uploading images for the SCAN project in the Laboratory of Neuro Imaging's Image & Data Archive (IDA). For sites needing to upload site qualification scans, instructions for uploading to the SCANQUAL project are also included. The IDA utilizes a data de-identification process and encrypted file transmission to help ensure compliance with participant-privacy regulations.

TOPICS
A. USER REGISTRATION
B. OBTAINING AND INSTALLING THE IDA-UPLOADER
C. UPLOADING (ARCHIVING) TO SCAN
D. UPLOADING (ARCHIVING) TO SCANQUAL (Qualification scans only)

SYSTEM REQUIREMENTS
The IDA system requires the following:
- a computer with Internet access
- newer web browser software (IE/Edge, Firefox, Chrome, Safari)
- a valid user account with upload access for SCAN and/or SCANQUAL
- installation of the IDA Uploader application

A. USER REGISTRATION (Skip this step and go to Step B if you already have an IDA account)
1. To register for a user account, go to the Image & Data Archive Log-In website (https://ida.loni.usc.edu) and select “Log In” in the top right corner.
2. Complete New account registration (3 steps).
   
a. Enter your email address and select “CONTINUE”. A security code will be emailed to you.
b. Enter the security code sent to your email and click “CONTINUE”.

c. Complete the New account registration form and click “REGISTER”. A link to set your password will be emailed to you with subject line “Welcome to the LONI Image & Data Archive”.

d. Create a password and click “CONTINUE”.
3. Your account is created, if you need upload access to SCAN or SCANQUAL, please send an email to the appropriate contact following the steps below:

For access to SCAN or SCANQUAL, email data.coordinator@loni.usc.edu

a. Enter “SCAN Upload Access Request” or “SCANQUAL Upload Access Request” in the subject line of your email.

b. Provide the email address you used when creating your account, your site name and site number in your email request.

c. You will receive an email when your account access has been set, generally within one working day.
B. OBTAINING AND INSTALLING THE IDA-UPLOADER

a. Installing the IDA-Uploader for Windows

b. Installing the IDA-Uploader for Mac

c. Installing the IDA-Uploader for Linux

a. Installing the IDA-Uploader for Windows

1. Log in to the IDA and select SCAN from the PROJECTS menu.
2. Select the ARCHIVE Menu option.
3. Select your operating system (Windows 32-bit or 64-bit) from the dropdown menu.
4. Click “Download”.

The upload process involves two basic steps:

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

IDA Uploader Application

You will need to launch the Uploader application from your computer to upload SCAN data. Choose your operating system and download the application below.

5. Open the application by clicking on the download in your browser or by locating the IDA-Uploader-2.0.msi application in the Downloads section of your File Explorer.
6. You will be taken to the IDA-Uploader Setup Wizard – click “Next” to continue.

7. Choose your destination folder and click “Next”.

![IDA-Uploader Setup Wizard]

![Destination Folder]
8. Click “Install”.
    Note: If you receive a popup asking for permission to run the application, click “yes”.

9. Click “Finish” to exit the Setup Wizard.
10. Locate the application on your device by typing in “IDA-Uploader” in the Windows Start Menu.

**b. Installing IDA-Uploader for Mac**

1. Log in to the IDA and select SCAN from the PROJECTS menu.
2. Click ARCHIVE from the Menu.
3. Select your operating system (Mac) from the dropdown menu.
4. Click “Download”.

The upload process involves two basic steps:

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

5. Open your Finder application, click Downloads, right-click ‘IDA-Uploader-2.0.pkg’ and select “Open”.

NOTE: If you try to install by double-clicking on ‘IDA-Uploader-2.0.pkg’, you may receive a message that it cannot be opened. Please ensure that you follow the instructions above to successfully open.
6. An Install IDA-Uploader window will appear. Click “Continue”.

7. Next, choose a destination for the installation. Click “Continue”.

![Install IDA-Uploader window](image)

![Select a Destination](image)
8. For Installation Type, you can review the details of the installation. Click “Install”.

9. During the installation, you will need to enter the User Name and Password for the computer. Click “Install Software”.

10. Once the installation is complete, the window will provide a summary of a successful installation. Click “Close”.

   NOTE: A window will appear to ask “Do you want to move the “IDA-Uploader” installer to the trash?”. You can choose Keep or Move to Trash.

![Installation Summary](image)

11. Locate the application in your computer by opening your Finder application. Click on Applications and double-click IDA-Uploader.

   c. **Installing IDA-Uploader for Linux**
      1. Log in to the IDA and select SCAN from the PROJECTS menu.
      2. Select the ARCHIVE Menu option.
      3. Select your operating system (Linux) from the dropdown menu.
      4. Click “Download”.
The upload process involves two basic steps:

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

### C. UPLOADING (ARCHIVING) TO SCAN

1. Open the **IDA-Uploader** application.
2. Enter your email and password, then click “Log In”.

5. Please visit [https://www.oracle.com/java/technologies/javase-downloads.html](https://www.oracle.com/java/technologies/javase-downloads.html) to download the latest Oracle JDK. **NOTE:** A minimum version of 15.0.1 is required to run IDA-Uploader-2.0.jar

6. Choose DEB, PRM or the compressed archive depending on your Linux Distribution.

7. Once you have completed the installation, open the terminal and run: `java -jar IDA-Uploader-2.0.jar`
3. Select SCAN from the Project dropdown menu.

4. Then, select your site from the Site dropdown menu. Click “Continue”.

5. Enter the participant identifiers into the Subject ID field using the convention PTID+NACC ID, where the PTID and NACC ID are separated by the ‘+’ character. Click “Browse” to select the Source Directory. Then click “Upload”.

**Important notes about entering participant identifiers:**

As a rule, the user should enter the complete PTID and NACC ID and follow the formatting convention used for UDS data submission when applicable. Either upper or lower case may be used for any alphabetic characters. If the given PTID and NACC ID pair match the record present in the NACC database, the upload will be accepted. If not, the user will receive an error message indicating that the PTID and NACC ID combination are not valid, and the upload will not be allowed to continue.
PLEASE NOTE: To upload data you must enter both the PTID and the NACC ID. To access your center's list of PTID and NACC ID pairs, you may work with your center UDS data manager to utilize the "PTID to NACC ID Map" tool available via the NACC portal: https://www.alz.washington.edu/MEMBER/portal.

Participant identifier terminology:

- PTID (may be referred to as Subject ID or local ID). This is the ADRC-managed participant ID which is a sequence of up to 10 characters. Formats vary by each center; this is the ID used for UDS (uniform dataset) identification internally.

- NACC ID: This is the NACC-managed participant ID. It is a string with the prefix 'NACC' followed by 6 digits.
NOTE: The Source Directory is the directory containing the files to be uploaded. If your Source Directory contains subdirectories, choose to include/exclude those files by checking “Search subdirectories”.

6. You will be able to see the progress of your upload in the De-identify and Upload section.
7. Once the files are de-identified and transferred to the IDA, you will need to complete the upload in your web browser.

8. Your web browser should automatically open a new “Log In to Continue” page. Enter your IDA email and password. Click “Log In”.
NOTE: If your web browser does not automatically open the “Log In to Continue” page, please click “Complete Upload” and you can copy-paste the link in your browser.

9. In the “Your Upload is Not Complete” page you can review the details of your upload.
For MRI image uploads, additional information is required in order to complete the upload.

1. Example of Image Upload Metadata form:
For PET image uploads, additional information is also required in order to complete the upload.

1. In the Metadata section, click “Complete Form”.
   NOTE: Fields marked (*Required) are required to complete the upload.
2. Once the information is entered in the form, click “Update”.

![Complete Metadata Form](image-url)
NOTE: If any data was mistakenly uploaded, you can click the “X” in the Delete column and it will be deleted from your upload. A window will appear to confirm the deletion. Click “Delete” to confirm file deletion or “Cancel”.

2. Once all required information has been entered, click “Finish Upload”.

![Confirm Deletion](image)

**Confirm Deletion**

This will delete the file below. This action cannot be undone.

- **Description:** Downs (128x128,3mm)
- **File Date and Time:** May 22, 2017 3:32 PM

![Delete Button](image)

![Finish Upload Button](image)
3. You will see a screen that informs you that the upload is being processed.

4. Once the upload is processed, a summary page for the upload will be displayed. Please note that you have the option of clicking “Download CSV Files” to keep a record of the upload.

5. You can close the IDA-Uploader application or to upload images for another participant, click the “Upload More” button in the IDA-Uploader application.
D. UPLOADING (ARCHIVING) TO SCANQUAL

1. Open the **IDA-Uploader** application.
2. Enter your email and password, then click “Log In”.

3. Select SCANQUAL from the dropdown menu. Once you select SCANQUAL, a dropdown with the sites will appear. Select your site and click Continue.
4. Click "Single Archive" or "Batch Archive".

   a. **Single Archive**
      
      Use the Single Archive process to upload one or more files from a single participant.

      1. After clicking “Single Archive” the De-Identification page will be displayed.

      ![IDA Uploader](image)

      a. Click the type of data being uploaded — in this case,” Original”.
      b. Enter the Phantom/Volunteer ID in the Participant ID field.
         - Phantom: 1_P_4000 (Site ID*_P_Number)
         - Volunteer: 1_V_4000 (Site ID*_V_Number)
         *Please note that there is no leading zeros in the site number.*
      c. Select the Source Directory in which the original files are located.
      d. Select the Target Directory for de-identified files to be written to.
      e. Click “CONTINUE” to begin the de-identification process.

   ![Batch Archive](image)
2. On the Verify and Submit page
   a. Deselect any image you do not want to be archived (if any) by unchecking the Selected checkbox.
   b. Click “SUBMIT” to begin the transmission process.
b. Batch Archive

The Batch Archive process is similar to Single Archive, except that multiple participants and image series can be submitted in a batch. Batches can be of the same or different modalities. However, users cannot review the results of the de-identification process prior to the batch upload.

1. Proceed to follow the De-identification steps in the Single Archive section.

2. The Batch Archive will skip the Verify and Submit step that is available in Single Archive, and direct you to the Image Database Batch Queue page.

3. Click “ADD MORE” to add more images to the Batch. Repeat this process until you have added everything you intend to archive.
4. Click “SUBMIT” to begin both the de-identification and transmission processes.
DOCUMENT REVISION HISTORY:

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Name</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>01 Sep. 2020</td>
<td>ADIR Lab</td>
<td>Initial draft</td>
</tr>
<tr>
<td>0.2</td>
<td>04 Nov. 2020</td>
<td>ADIR Lab</td>
<td>Updated sequence selection</td>
</tr>
<tr>
<td>1.0</td>
<td>15 Mar. 2021</td>
<td>ADIR Lab</td>
<td>Updated Nomenclature added LONI instructions, Logo</td>
</tr>
<tr>
<td>1.1</td>
<td>16 Mar. 2021</td>
<td>ADIR Lab</td>
<td>Updated logo, minor edits.</td>
</tr>
<tr>
<td>1.2</td>
<td>17 Mar. 2021</td>
<td>ADIR Lab</td>
<td>Nomenclature updated.</td>
</tr>
<tr>
<td>1.3</td>
<td>12 May 2021</td>
<td>ADIR Lab</td>
<td>Sequences/Order Updated</td>
</tr>
<tr>
<td>1.4</td>
<td>01 Dec 2021</td>
<td>ADIR Lab</td>
<td>Edits</td>
</tr>
<tr>
<td>1.5</td>
<td>22 Feb 2022</td>
<td>ADIR Lab</td>
<td>Added LONI Metadata information</td>
</tr>
<tr>
<td>1.6</td>
<td>13 Apr 2022</td>
<td>ADIR Lab</td>
<td>Added MRI Checklist additional edits</td>
</tr>
<tr>
<td>1.7</td>
<td>21 Apr 2023</td>
<td>ADIR Lab</td>
<td>Updated Links</td>
</tr>
<tr>
<td>1.8</td>
<td>14 Mar 2023</td>
<td>ADIR Lab</td>
<td>Updated Participant ID Upload nomenclature, screenshots</td>
</tr>
<tr>
<td>1.9</td>
<td>23 Jun 2023</td>
<td>NACC</td>
<td>Updated Participant ID Upload information under Data Transfer Section C. Uploading (Archiving) to SCAN</td>
</tr>
</tbody>
</table>