



**UCSF-QUEST DIAGNOSTICS PARTNERSHIP**

**DEMENTIA CARE PATHWAY**

# **MR PROTOCOL FOR DEMENTIA PATIENTS**

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## **1. NEUROIMAGING OVERVIEW**

This section provides a high level overview of the imaging protocol and analysis that has been established for imaging patients that are being assessed for dementia. The critical components to this effort are summarized below.

### *1.1 Background and Goals of Quest Neuroimaging Initiative*

The UCSF/Quest MR protocol is designed to provide consistent and relevant imaging information that will be used in the diagnosis of dementia. A range of image contrasts are prescribed that are suitable for this application and the established imaging protocol is designed for use on a wide range of MR systems operating at field strengths of both 1.5 and 3 Tesla. Improved diagnostic power is expected by utilizing a consistent and standardized MR imaging protocol that is additionally amenable to quantitative analysis. More consistent clinical interpretations, with improved diagnostic sensitivity and specificity, are anticipated through this initiative.

### *1.2 Components of MR Protocol*

The MR protocol is designed to be run in a 30-minute time slot and actual scan time is 20-25 minutes. The protocol includes a volumetric T1-weighted protocol that is based on the Alzheimer's Disease Neuroimaging Initiative (ADNI) protocol. This well established and standardized imaging sequence is well suited to quantitative analysis and has been utilized in a wide range of scientific studies. The protocol further contains multi-slice sequences with T2, T2\* and T2-FLAIR contrasts. Each of these multi-slice imaging sequences has matching spatial coverage and can be acquired in a time efficient fashion. The final element of the protocol is diffusion weighted imaging (DWI), which is acquired in both axial and coronal scan planes. DWI is acquired with diffusion sensitization in three orthogonal directions and with a b-value of 1000s/mm<sup>2</sup>.

## **2. SITE SET-UP**

This section reviews the steps that are necessary for an imaging center to participate in this neuroimaging initiative.

### *2.1 Site Requirements*

Participant sites must have an MR system for which a standardized imaging protocol has been established and tested. To date, standardized imaging protocols have been established for General Electric (GE), Philips, and Siemens scanners operating at field strengths of 1.5T and 3T. The imaging protocol is designed to run on all relatively recent software releases and minimal specialized software packages are required. Once established, the UCSF/Quest imaging protocol must be “locked” and left unaltered. Study coordinators should be notified if a software upgrade or system change result in changes in any protocol parameters.

### *2.2 Protocol Installation*

Protocols can be installed on scanners via one of two different mechanisms. Whenever possible, the protocol should be loaded via the protocol exchange (GE), examcard (Philips), or EDX (Siemens) protocol sharing systems. This assures that all parameter settings are consistent with the Quest imaging protocol. Details on how to upload via this mechanism are provided in Appendix 5.2 and may require the assistance of a service engineer. In some instances software incompatibilities cause this installation approach to fail. In those instances the protocol can be manually entered and parameter file specifications are provided for each manufacturer and field strength in Appendix 5.3. Regardless of installation method, sites are required to scan a phantom and submit the resulting data set for certification that the protocol is properly installed on the system. Once this review has been completed the protocol should be locked and archived so that later modifications at the site do not occur.

### **3. MRI SUBJECT PRE-SCAN PROCEDURES**

#### *3.1 Subject Pre-Screening*

All subjects must be screened for MRI contraindications immediately before the MRI scan using your local standard protocol. Contraindications may include, but are not limited to:

- The presence of non-removable ferrous metal objects
- Aneurysm clips
- Metal fragments in the eyes
- Pacemakers
- Other contraindications such as defibrillators, etc.

Subjects must also not be severely claustrophobic and must be capable of remaining still for the 30-minute examination period. Patient fixation devices, straps etc. can be used to minimize patient motion.

#### *3.2 Subject Safety and Monitoring*

MR is generally a very safe imaging modality and does not involve ionizing radiation. For best results the scan procedure should be explained to the subject so that they know what to expect during the MRI. Make sure that all loose metal objects are removed from the patient prior to entering the magnet room. If available, ask the subject to change into hospital robes or scrubs to ensure no ferrous objects or materials enter the scan room. Use standard local practice for monitoring the subject during the scan. These may include devices to monitor pulse and O<sub>2</sub> levels.

#### 4. QUEST MRI SCAN PROTOCOL

The scan protocol consists of 20-25 minutes of MR scanning and can be completed within a 30-minute time slot. Patients should be placed in a multi-element head coil such as the 8-channel In Vivo head coil (below). Other variants including manufacturer head and head/neck coils are also acceptable.



In Vivo's Hi-Res Head Coil is available for GE, Philips or Siemens systems.

##### 4.1 Protocol Overview

The protocol consists of the following scans:

##### **UCSF/Quest MRI Scan Protocol:**

- 1) Localizer
  - 1a) Calibration/Reference Scan (if necessary)
- 2) Sagittal 3D T1 MPRAGE/IR-SPGR (angled to midline)
- 3) Axial 2D T2\* GRE (angled to AC/PC)
- 4) Axial 2D T2 turbo-FLAIR (angled to AC/PC; matches scan 3)
- 5) Axial 2D T2 turbo/fast spin echo (angled to AC/PC; matches scan 3)
- 6) Axial 2D Diffusion Weighted Imaging (angled to AC/PC)
- 7) Coronal 2D Diffusion Weighted Imaging (angled to brain stem)

These scans should be run exactly as prescribed in the originally installed protocol and in the indicated order.

##### 4.2 Troubleshooting Protocol: Additional Scans for RPD cases not diagnosed by General Dementia Protocol (e.g., need for contrast or question of prion disease remains)

The standardized dementia protocol is recommended for both chronic and rapidly progressive dementia. Sites should detect many if not most causes for RPD on the initial standardized dementia protocol scans. The additional scans listed below would be used

only for troubleshooting purposes if a diagnosis is unclear or more imaging information is required.

### **RPD Trouble Shooting Protocol:**

#### **General dementia protocol plus the following:**

- 8) Coronal 2D T2 turbo/fast spin echo (coronal orientation along hippocampal axis 3 skip 0 mm)
- 9) Coronal 2D T2 turbo-FLAIR (coronal orientation along hippocampal axis 3 skip 0 mm)
- 10) Sagittal 3D T1 MPRAGE/IR-SPGR (angled to midline) post contrast
- 11) Axial spin echo T1 post contrast

Recommended adjustments to **General Dementia Protocol** scans:

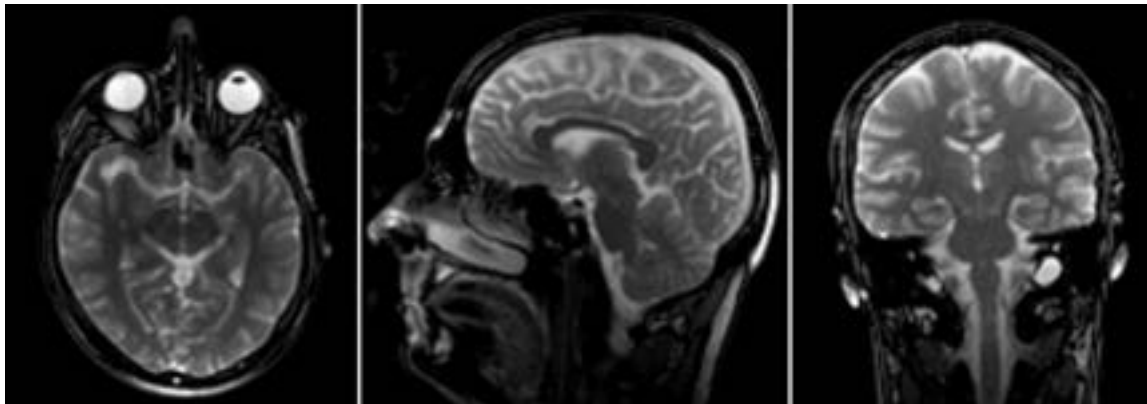
- 6) Axial 2D B2000 Diffusion Weighted Imaging (angled to AC/PC) \*\*‡
- 7) Coronal 2D B2000 Diffusion Weighted Imaging (angled to brainstem) \*\*‡

\* Should be B2000 DWI either for 1.5 and 3.T

‡ On Siemens 3T B2000 should be "Resolve" for coronal.

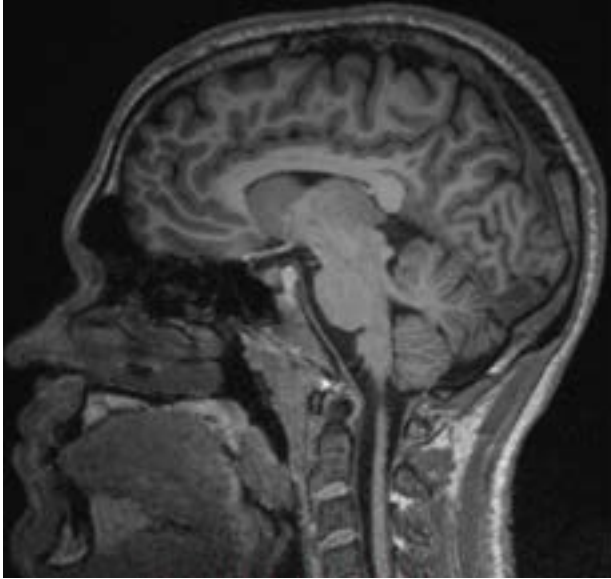
## 4.3 Scanning Sequences

### 4.3.1 – Localizer + Calibration/Reference Scans



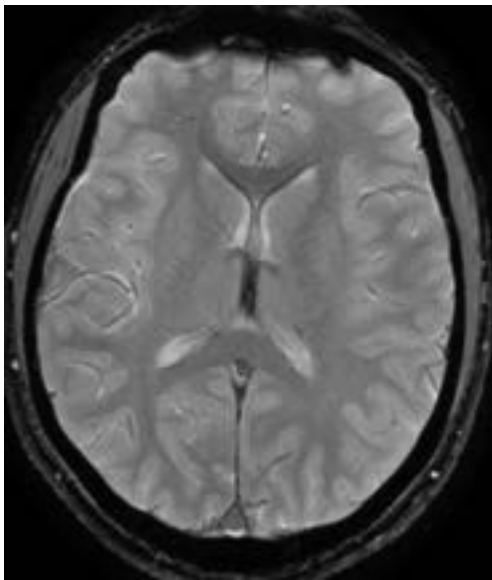
A conventional 3-plane localizer should be used to position subsequent scans. Parallel imaging (ASSET/SENSE/GRAPPA) will be used on the DWI scans so any calibration /reference scans required by your MR system should also be acquired at this time.

#### 4.3.2 - Sagittal 3D T1 MPRAGE/IR-SPGR



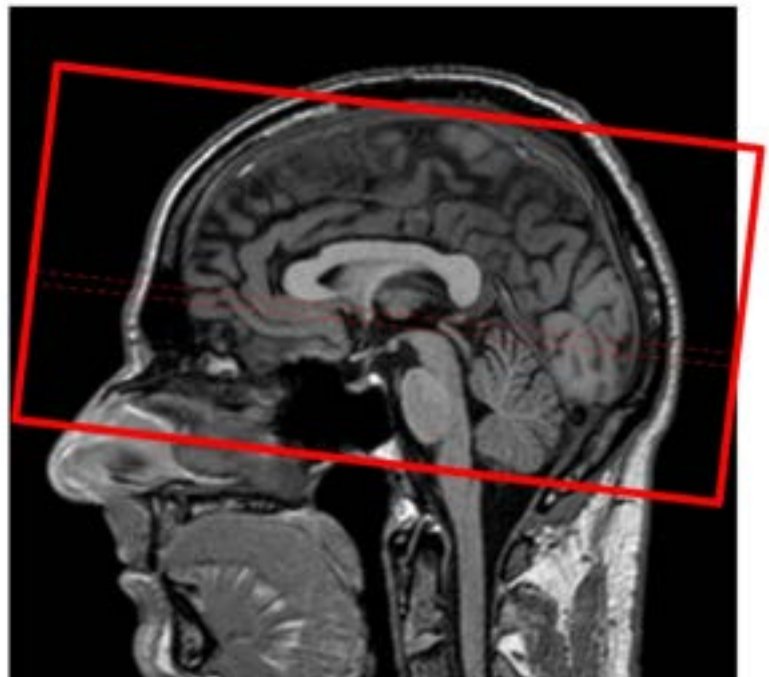
Scanning Notes: This sagittal T1 volume should be angled on the axial scout such that the middle slice runs along the mid-line of the brain and encompasses the full width of the brain. Additional slices can be added to achieve this but slices **MUST NOT** be removed. Make sure that the scan volume extends **SLIGHTLY BEYOND** the top of the scalp.

#### 4.3.3 - Axial 2D T2\* GRE

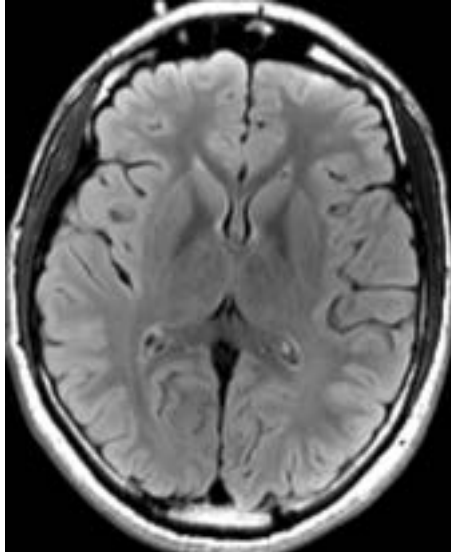


Scanning Notes: This axial stack of 2D slices should be angulated on a midline sagittal scan such that it runs parallel to the Anterior Commissure/Posterior Commissure (AC/PC) of the brain (see below). The volume should extend from the top of the brain and continue as low as possible **WITHOUT** changing the number of slices, slice thickness or slice gap.

Scanning Notes: Angulation of the axial scan plane to AC/PC is demonstrated. The previously acquired Sagittal T1 volume can be used to identify AC/PC (dotted area) if it is not clearly seen on the localizer images.

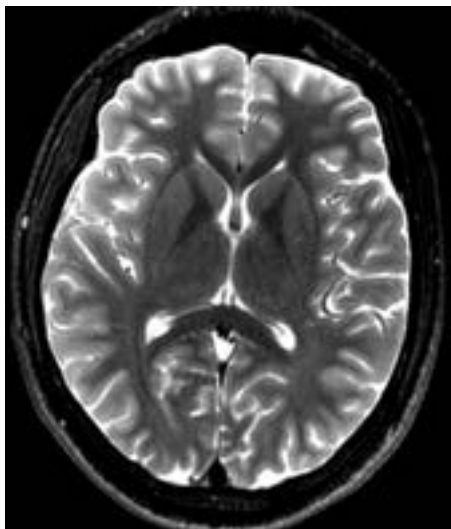


#### 4.3.4 - Axial 2D T2 turbo FLAIR



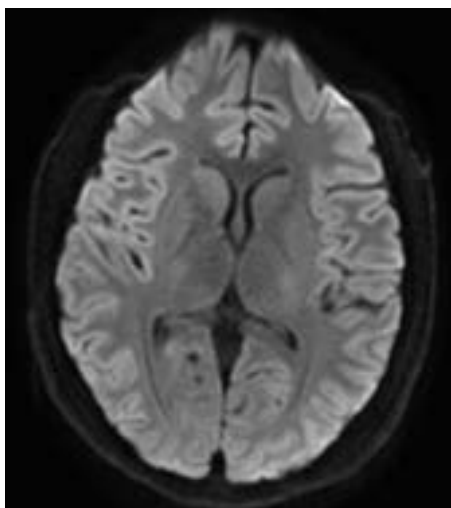
Scanning Notes: The field of view (FOV) and coverage of this scan exactly match that of Scan (3) - Axial 2D T2\* GRE. The scan volume for this acquisition should EXACTLY MATCH that of the prior scan.

#### 4.3.5 - Axial 2D T2 turbo/fast Spin Echo



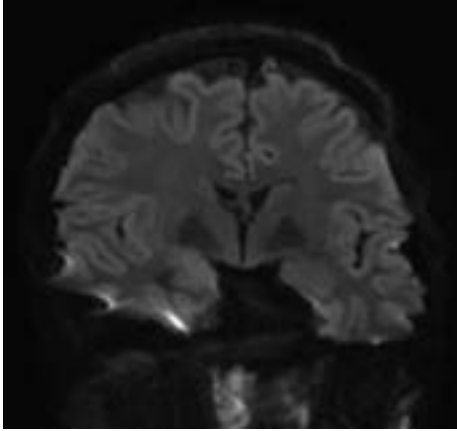
Scanning Notes: The field of view (FOV) and coverage of this scan exactly match that of Scan (3) - Axial 2D T2\* GRE. The scan volume for this acquisition should EXACTLY MATCH that of the prior scan.

#### 4.3.6 - Axial Diffusion Weighted Imaging



Scanning Notes: The axial DWI volume should also be angulated to AC/PC, but its coverage is not identical to scans (3) – (5). The axial scan plane should similarly be positioned such that it reaches the top of the brain and extends inferiorly as far as the prescribed slices allow.

#### 4.3.7 - Coronal Diffusion Weighted Imaging



Scanning Notes: The coronal plane should be angulated to be parallel to the brain stem and coverage should extend from the anterior to posterior extremes of the brain. If necessary slices can be added to achieve this coverage (this may prolong the TR, which is acceptable).

#### *4.4 Quality Assurance*

It is important for the MR technologist to inspect scans to assure that they are of high quality and have not been degraded by patient motion. This is particularly important for the 3D T1 MPAGE/IR-SPGR (scan 2), which will be used for quantitative analysis. Scans that are degraded by artifact or patient motion should be repeated.

## **5. APPENDICES**

The following pages contain a series of appendices that contain information on protocol content and uploading. Please refer to the page numbers for the content.

<i>5.1 MR Protocol Quick Reference Guide</i>	Page 11
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<i>5.2 Protocol Parameter Listings</i>	
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5.2.2: 1.5T Philips	Pages 29-39
5.2.3: 1.5T Siemens	Pages 40-52
5.2.4: 3T GE	Pages 53-66
5.2.5: 3T Philips	Pages 67-81
5.2.6: 3T Siemens	Pages 82-95



# UCSF/Quest MR Imaging QUICK REFERENCE GUIDE

*MR manufacturers have all established methods for sharing scanning protocols between systems. The process typically involves loading the necessary protocol files onto a USB drive, connecting to USB to the MR system, and following a series of commands. It may be necessary to have your service engineer perform this installation if you don't have the necessary privileges on your MR system.*

**GE ProtocolExchange:** Begin by placing the protocol exchange files on a USB drive and plug the drive into the MR console computer. Under the "Image Management" tab there is a feature called "Protocol Exchange", which you should click on. A window will pop up and you should then select "Import Mode". Another window will appear

**Philips Examcard:** Begin by placing the examcard file on a USB drive and plug the drive into the MR console computer. Select the windows button on the keyboard and select "

**Siemens ".edx" file: .**

# UCSF/Quest MR Imaging

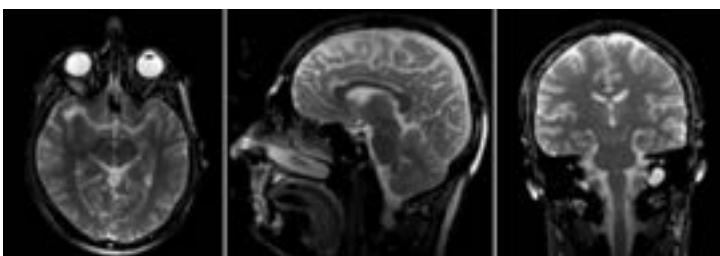
## QUICK REFERENCE GUIDE

The UCSF/Quest Neuroimaging protocol is a standardized set of MR imaging sequences that have been established for a range of imaging platforms. It is important to run the correct protocol and assure that patient motion has not corrupted a scan before proceeding to the next acquisition.<sup>1\*</sup>

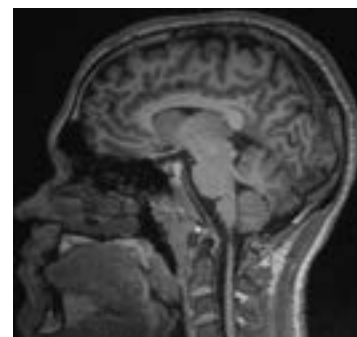
**Step 1:** Follow your institutions standard MR pre-screening practices.

**Step 2:** Position the subject in a head coil in a head first supine orientation. Use straps and/or pads to help the subject remain stationary during scanning

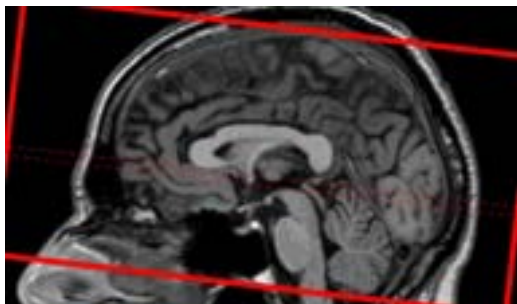
**Step 3:** Acquire a standard 3-plane localizer and any necessary calibration scans.



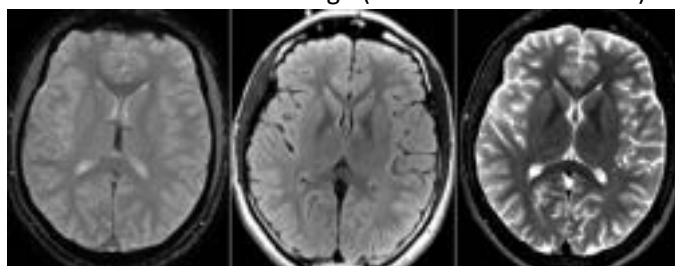
**Step 4:** Prescribe the ADNI MP-RAGE/IR-FSPGR scan in an oblique sagittal plane that is oriented to midline.



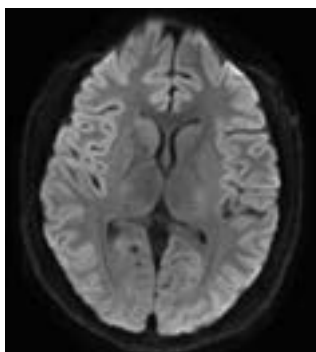
**Step 5:** Use the mid-sagittal plane of the ADNI MP-RAGE/IR-FSPGR scan to orient oblique axial scans to the anterior and posterior commissures (AC/PC).



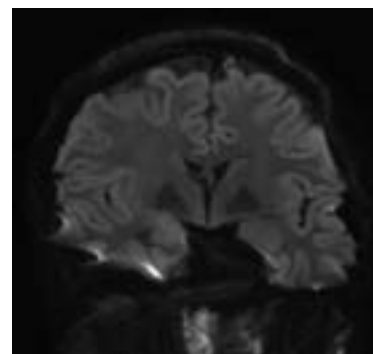
**Step 6:** Acquire the axial T2\* gradient echo, T2-FLAIR and T2 TSE scans in this orientation and with matching coverage. Cover from the top of the brain down with the available slice coverage (do not add or subtract).



**Step 7:** Acquire the oblique axial DWI with the same angulations as the prior axial scans (coverage won't match). Again, Cover from the top of the brain down with the available slice coverage (do not add or subtract)



**Step 8:** Acquire the oblique coronal DWI such that the scan plane is oriented to the brain stem. Additional slices may be added to achieve full anterior/posterior coverage of the brain.



# GE 1.5T

## UCSF/Quest Protocol - Survey

PATIENT POSITION		IMAGING PARAMETERS	
Patient Entry	Head First	Gradient Mode	WHOLE
Patient Position	Supine	Imaging Mode	2D
Coil Configuration	8 Ch High Res Brain Array by MRI Devices	Pulse Sequence	Spin Echo
Plane	3-PLANE	Imaging Options	Seq, EDR, Fast, SS, ARC
Series Description	LOCALIZER	n/a	12
SCAN TIMING		SCAN RANGE	
TE	Minimum	FOV	35.0
TR	Minimum	Slice Thickness	10.0
Receiver Bandwidth	62.50	Slice Spacing	5.0
		Center Location 1	0.0
		Center Location 2	A25.0
		Center Location 3	0.0
		Slice for 3 Plane Localizaion	0
		Slice for 3 Plane Localizaion	10
		Slice for 3 Plane Localizaion	6
		Slice for 3 Plane Localizaion	6
		Space per Plane 1	5.0
		Space per Plane 2	4.0
		Table Delta	0.00
IMAGE ENHANCE		ACQ TIMING	
Filter Choice	None	Freq	256
		Phase	128
		Freq DIR	Unswap
		# of Acq. Before Pause	0
		Phase FOV	1.00
		Auto Shim	Auto
		Phase Correction	No
GATING/TRIGGER		USER CVS	
Heart Beat per Minute Mode	0	User CV2	240.00
Auto Trigger Type	Off	User CV13	1.00
Auto Trigger Window	Off	User CV Mask	8262
FMRI		MULTI-PHASE	
PSD Trigger	Internal	# of Acquisition	0
Slice Order	Interleaved	Seperate Series	0
View Order	Bottom/Up	Mask Phase	0
# of Repetitions REST	0	Mask Pause	0
# of Repetitions ACTIVE	0		

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SAT		DIFFUSION	
Tag Type	<i>None</i>	Recon All Images	<i>On</i>
TRICKS		CONTRAST	
Pause On/Off	<i>On</i>	Contrast Yes/No	<i>No</i>
Auto Subtract	<i>0</i>	Contrast Amount	<i>6</i>
Auto SCIC	<i>Off</i>		

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## UCSF/Quest Protocol – ASSET Calibration

PATIENT POSITION		IMAGING PARAMETERS	
Patient Entry	<i>Head First</i>	Gradient Mode	<i>WHOLE</i>
Patient Position	<i>Supine</i>	Imaging Mode	<i>2D</i>
Coil Configuration	<i>8 Ch High Res Brain Array by MRI Devices</i>	Pulse Sequence	<i>Gradient Echo</i>
Plane	<i>AXIAL</i>	Imaging Options	<i>Fast, Calib</i>
Series Description	<i>Calibration</i>	n/a	<i>5</i>
		IDEAL	<i>3</i>
SCAN TIMING		SCAN RANGE	
Number of Echoes	<i>1</i>	FOV	<i>30.0</i>
		Slice Thickness	<i>7.0</i>
		Slice Spacing	<i>0.0</i>
		GRXOPT	<i>0</i>
		Start Location 1	<i>I135.9</i>
		End Location 1	<i>S130.1</i>
		End Location 2	<i>L1.7</i>
		End Location 3	<i>A40.2</i>
		Center of Location Start	<i>L1.7</i>
		Center of Location End	<i>A40.2</i>
		Number of Slices	<i>39</i>
		Slice for 3 Plane	<i>0</i>
		Localizaion	
		Slice for 3 Plane	<i>0</i>
		Localizaion	
		Slice for 3 Plane	<i>0</i>
		Localizaion	
		Slice for 3 Plane	<i>0</i>
		Localizaion	
		Space per Plane 1	<i>0.0</i>
		Space per Plane 2	<i>0.0</i>
		Table Delta	<i>0.00</i>
IMAGE ENHANCE		ACQ TIMING	
Filter Choice	<i>None</i>	Freq DIR	<i>R/L</i>
		Auto Shim	<i>Auto</i>
		Phase Correction	<i>No</i>
GATING/TRIGGER		USER CVS	
Heart Beat per Minute Mode	<i>0</i>	User CV Mask	<i>0</i>
Auto Trigger Type	<i>Off</i>		
Auto Trigger Window	<i>Off</i>		
FMRI		MULTI-PHASE	
PSD Trigger	<i>Internal</i>	# of Acquisition	<i>0</i>
Slice Order	<i>Interleaved</i>	Seperate Series	<i>0</i>
View Order	<i>Bottom/Up</i>	Mask Phase	<i>0</i>

Calibration

Calibration

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<b># of Repetitions REST</b>	<i>0</i>	<b>Mask Pause</b>	<i>0</i>
<b># of Repetitions ACTIVE</b>	<i>0</i>		
<b>SAT</b>		<b>DIFFUSION</b>	
<b>Tag Type</b>	<i>None</i>	<b>Recon All Images</b>	<i>On</i>
<b>TRICKS</b>		<b>CONTRAST</b>	
<b>Pause On/Off</b>	<i>On</i>	<b>Contrast Yes/No</b>	<i>No</i>
<b>Auto Subtract</b>	<i>0</i>	<b>Contrast Amount</b>	<i>7</i>
<b>Auto SCIC</b>	<i>Off</i>		

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## UCSF/Quest Protocol – IR-FSPGR

PATIENT POSITION		IMAGING PARAMETERS	
Patient Entry	<i>Head First</i>	Gradient Mode	<i>ZOOM</i>
Patient Position	<i>Supine</i>	Imaging Mode	<i>3D</i>
Coil Configuration	<i>0</i>	Pulse Sequence	<i>SPGR</i>
Plane	<i>OBLIQUE</i>	Imaging Options	<i>EDR, Fast, IrP, Asset</i>
Series Description	<i>IR-FSPGR</i>	n/a	<i>6</i>
SCAN TIMING		SCAN RANGE	
Flip Angle	<i>8</i>	FOV	<i>24.0</i>
TE	<i>Min Full</i>	Slice Thickness	<i>1.2</i>
TI	<i>1000</i>	Location per Slab	<i>170</i>
Receiver Bandwidth	<i>15.63</i>	Overlap Locations	<i>0</i>
		Start Location 1	<i>0.0</i>
		Start Location 2	<i>0.0</i>
		Start Location 3	<i>0.0</i>
		End Location 1	<i>R25.0</i>
		End Location 2	<i>0.0</i>
		End Location 3	<i>0.0</i>
		Number of Slices	<i>1</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Space per Plane 1	<i>0.0</i>
		Space per Plane 2	<i>0.0</i>
		Table Delta	<i>0.00</i>
IMAGE ENHANCE		ACQ TIMING	
Filter Choice	<i>None</i>	Freq	<i>192</i>
		Phase	<i>192</i>
		Freq DIR	<i>S/I</i>
		NEX	<i>1.00</i>
		Phase FOV	<i>1.00</i>
		Auto Shim	<i>Auto</i>
		Phase Correction	<i>No</i>
GATING/TRIGGER		USER CVS	
Heart Beat per Minute Mode	<i>0</i>	User CV6	<i>1.00</i>
Auto Trigger Type	<i>Off</i>	User CV23	<i>100.00</i>
Auto Trigger Window	<i>Off</i>	User CV Mask	<i>8388688</i>
FMRI		MULTI-PHASE	
PSD Trigger	<i>Internal</i>	# of Acquisition	<i>0</i>

IR-FSPGR

IR-FSPGR

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Protocol: adult\_head\_QUEST11112015\_20151112135614257\_1

<b>Slice Order</b>	<i>Interleaved</i>	<b>Seperate Series</b>	<i>0</i>
<b>View Order</b>	<i>Bottom/Up</i>	<b>Mask Phase</b>	<i>0</i>
<b># of Repetitions REST</b>	<i>0</i>	<b>Mask Pause</b>	<i>0</i>
<b># of Repetitions ACTIVE</b>	<i>0</i>		
<b>SAT</b>		<b>DIFFUSION</b>	
<b>Tag Type</b>	<i>None</i>	<b>Recon All Images</b>	<i>On</i>
<b>TRICKS</b>		<b>CONTRAST</b>	
<b>Pause On/Off</b>	<i>On</i>	<b>Contrast Yes/No</b>	<i>No</i>
<b>Auto Subtract</b>	<i>0</i>	<b>Contrast Amount</b>	<i>6</i>
<b>Auto SCIC</b>	<i>2</i>		

---

## UCSF/Quest Protocol – Axial T2\*

PATIENT POSITION		IMAGING PARAMETERS	
<b>Patient Entry</b>	<i>Head First</i>	<b>Gradient Mode</b>	<i>ZOOM</i>
<b>Patient Position</b>	<i>Supine</i>	<b>Imaging Mode</b>	<i>2D</i>
<b>Coil Configuration</b>	<i>HD 8Ch High Res Brain Array by Invivo</i>	<b>Pulse Sequence</b>	<i>Gradient Echo</i>
<b>Plane</b>	<i>OBLIQUE</i>	<b>Imaging Options</b>	<i>FC, EDR, ZIP512</i>
<b>Series Description</b>	<i>Ax T2* GRE</i>	<b>n/a</b>	<i>0</i>
SCAN TIMING		SCAN RANGE	
<b>Flip Angle</b>	<i>20</i>	<b>FOV</b>	<i>25.6</i>
<b>TE</b>	<i>20.0</i>	<b>Slice Thickness</b>	<i>4.0</i>
<b>Number of Echoes</b>	<i>1</i>	<b>Slice Spacing</b>	<i>0.0</i>
<b>TR</b>	<i>650.0</i>	<b>Start Location 1</b>	<i>L5.0</i>
<b>Receiver Bandwidth</b>	<i>25.00</i>	<b>Start Location 2</b>	<i>A6.4</i>
		<b>Start Location 3</b>	<i>I72.7</i>
		<b>End Location 1</b>	<i>L5.0</i>
		<b>End Location 2</b>	<i>P0.5</i>
		<b>End Location 3</b>	<i>S99.0</i>
		<b>Number of Slices</b>	<i>44</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Space per Plane 1</b>	<i>0.0</i>
		<b>Space per Plane 2</b>	<i>0.0</i>
		<b>Table Delta</b>	<i>0.00</i>
IMAGE ENHANCE		ACQ TIMING	
<b>Filter Choice</b>	<i>None</i>	<b>Freq</b>	<i>192</i>
		<b>Phase</b>	<i>192</i>
		<b>Freq DIR</b>	<i>A/P</i>
		<b>NEX</b>	<i>1.00</i>
		<b># of Acq. Before Pause</b>	<i>0</i>
		<b>Phase FOV</b>	<i>1.00</i>
		<b>Auto Shim</b>	<i>Auto</i>
		<b>Phase Correction</b>	<i>No</i>
GATING/TRIGGER		USER CVS	
<b>Heart Beat per Minute Mode</b>	<i>0</i>	<b>User CV Mask</b>	<i>0</i>
<b>Auto Trigger Type</b>	<i>Off</i>		
<b>Auto Trigger Window</b>	<i>Off</i>		
FMRI		MULTI-PHASE	

Ax T2\* GRE

Ax T2\* GRE

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Protocol: adult\_head\_QUEST11112015\_20151112135614257\_1

<b>PSD Trigger</b>	<i>Internal</i>	<b># of Acquisition</b>	<i>0</i>
<b>Slice Order</b>	<i>Interleaved</i>	<b>Seperate Series</b>	<i>0</i>
<b>View Order</b>	<i>Bottom/Up</i>	<b>Mask Phase</b>	<i>0</i>
<b># of Repetitions REST</b>	<i>0</i>	<b>Mask Pause</b>	<i>0</i>
<b># of Repetitions ACTIVE</b>	<i>0</i>		
<b>SAT</b>		<b>DIFFUSION</b>	
<b>Tag Type</b>	<i>None</i>	<b>Recon All Images</b>	<i>On</i>
<b>TRICKS</b>		<b>CONTRAST</b>	
<b>Pause On/Off</b>	<i>On</i>	<b>Contrast Yes/No</b>	<i>No</i>
<b>Auto Subtract</b>	<i>0</i>	<b>Contrast Amount</b>	<i>6</i>
<b>Auto SCIC</b>	<i>2</i>		

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## UCSF/Quest Protocol – Axial T2 FLAIR

PATIENT POSITION		IMAGING PARAMETERS	
<b>Patient Entry</b>	<i>Head First</i>	<b>Gradient Mode</b>	<i>ZOOM</i>
<b>Patient Position</b>	<i>Supine</i>	<b>Imaging Mode</b>	<i>2D</i>
<b>Coil Configuration</b>	<i>HD 8Ch High Res Brain Array by Invivo</i>	<b>Pulse Sequence</b>	<i>T2flair</i>
<b>Plane</b>	<i>OBLIQUE</i>	<b>Imaging Options</b>	<i>EDR, Fast</i>
<b>Series Description</b>	<i>AX T2 FLAIR</i>	<b>PSD Name</b>	<i>enhflair</i>
SCAN TIMING		SCAN RANGE	
<b>TE</b>	<i>90.0</i>	<b>FOV</b>	<i>25.6</i>
<b>TR</b>	<i>9000.0</i>	<b>Slice Thickness</b>	<i>4.0</i>
<b>TI</b>	<i>2200</i>	<b>Slice Spacing</b>	<i>0.0</i>
<b>Echo Train Length</b>	<i>16</i>	<b>Start Location 1</b>	<i>L5.0</i>
<b>Receiver Bandwidth</b>	<i>20.83</i>	<b>Start Location 2</b>	<i>A6.4</i>
		<b>Start Location 3</b>	<i>I72.7</i>
		<b>End Location 1</b>	<i>L5.0</i>
		<b>End Location 2</b>	<i>P0.5</i>
		<b>End Location 3</b>	<i>S53.6</i>
		<b>Number of Slices</b>	<i>44</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Space per Plane 1</b>	<i>0.0</i>
		<b>Space per Plane 2</b>	<i>0.0</i>
		<b>Table Delta</b>	<i>0.00</i>
IMAGE ENHANCE		ACQ TIMING	
<b>Filter Choice</b>	<i>None</i>	<b>Freq</b>	<i>256</i>
		<b>Phase</b>	<i>256</i>
		<b>Freq DIR</b>	<i>A/P</i>
		<b>NEX</b>	<i>1.00</i>
		<b># of Acq. Before Pause</b>	<i>0</i>
		<b>Phase FOV</b>	<i>0.88</i>
		<b>Auto Shim</b>	<i>Auto</i>
		<b>Phase Correction</b>	<i>No</i>
GATING/TRIGGER		USER CVS	
<b>Heart Beat per Minute Mode</b>	<i>0</i>	<b>User CV12</b>	<i>1.00</i>
<b>Auto Trigger Type</b>	<i>Off</i>	<b>User CV17</b>	<i>1.00</i>
<b>Auto Trigger Window</b>	<i>Off</i>	<b>User CV Mask</b>	<i>10639616</i>

AX T2 FLAIR

AX T2 FLAIR

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Protocol: adult\_head\_QUEST11112015\_20151112135614257\_1

<b>FMRI</b>		<b>MULTI-PHASE</b>	
PSD Trigger	<i>Internal</i>	# of Acquisition	<i>0</i>
Slice Order	<i>Interleaved</i>	Seperate Series	<i>0</i>
View Order	<i>Bottom/Up</i>	Mask Phase	<i>0</i>
# of Repetitions REST	<i>0</i>	Mask Pause	<i>0</i>
# of Repetitions ACTIVE	<i>0</i>		
<b>SAT</b>		<b>DIFFUSION</b>	
Tag Type	<i>None</i>	Recon All Images	<i>On</i>
<b>TRICKS</b>		<b>CONTRAST</b>	
Pause On/Off	<i>On</i>	Contrast Yes/No	<i>No</i>
Auto Subtract	<i>0</i>	Contrast Amount	<i>6</i>
Auto SCIC	<i>2</i>		

## UCSF/Quest Protocol – Axial T2

PATIENT POSITION		IMAGING PARAMETERS	
<b>Patient Entry</b>	<i>Head First</i>	<b>Gradient Mode</b>	<i>ZOOM</i>
<b>Patient Position</b>	<i>Supine</i>	<b>Imaging Mode</b>	<i>2D</i>
<b>Coil Configuration</b>	<i>HD 8Ch High Res Brain Array by Invivo</i>	<b>Pulse Sequence</b>	<i>FRFSE-XL</i>
<b>Plane</b>	<i>OBLIQUE</i>	<b>Imaging Options</b>	<i>FC, EDR, TRF, Fast, ZIP512, FR, ARC</i>
<b>Series Description</b>	<i>AX T2 4MM</i>	<b>n/a</b>	<i>23</i>
SCAN TIMING		SCAN RANGE	
<b>TE</b>	<i>90.0</i>	<b>FOV</b>	<i>25.6</i>
<b>Number of Echoes</b>	<i>1</i>	<b>Slice Thickness</b>	<i>4.0</i>
<b>TR</b>	<i>3000.0</i>	<b>Slice Spacing</b>	<i>0.0</i>
<b>Echo Train Length</b>	<i>16</i>	<b>Start Location 1</b>	<i>0.0</i>
<b>Receiver Bandwidth</b>	<i>19.23</i>	<b>Start Location 2</b>	<i>0.0</i>
		<b>Start Location 3</b>	<i>160.0</i>
		<b>End Location 1</b>	<i>0.0</i>
		<b>End Location 2</b>	<i>0.0</i>
		<b>End Location 3</b>	<i>S120.0</i>
		<b>Number of Slices</b>	<i>44</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Slice for 3 Plane Localizaion</b>	<i>0</i>
		<b>Space per Plane 1</b>	<i>0.0</i>
		<b>Space per Plane 2</b>	<i>0.0</i>
		<b>Table Delta</b>	<i>0.00</i>
IMAGE ENHANCE		ACQ TIMING	
<b>Filter Choice</b>	<i>None</i>	<b>Freq</b>	<i>256</i>
		<b>Phase</b>	<i>256</i>
		<b>Freq DIR</b>	<i>A/P</i>
		<b>NEX</b>	<i>1.00</i>
		<b># of Acq. Before Pause</b>	<i>0</i>
		<b>Phase FOV</b>	<i>0.88</i>
		<b>Auto Shim</b>	<i>Auto</i>
		<b>Phase Correction</b>	<i>No</i>
		<b>Flow Direction Compensation</b>	<i>Slice</i>
GATING/TRIGGER		USER CVS	
<b>Heart Beat per Minute Mode</b>	<i>0</i>	<b>User CV7</b>	<i>1.00</i>

AX T2 4MM

AX T2 4MM

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Protocol: adult\_head\_QUEST11112015\_2015112135614257\_1

<b>Auto Trigger Type</b>	<i>Off</i>	<b>User CV17</b>	<i>1.00</i>
<b>Auto Trigger Window</b>	<i>Off</i>	<b>User CV19</b>	<i>1.00</i>
		<b>User CV Mask</b>	<i>2769344</i>
<b>FMRI</b>		<b>MULTI-PHASE</b>	
<b>PSD Trigger</b>	<i>Internal</i>	<b># of Acquisition</b>	<i>0</i>
<b>Slice Order</b>	<i>Interleaved</i>	<b>Seperate Series</b>	<i>0</i>
<b>View Order</b>	<i>Bottom/Up</i>	<b>Mask Phase</b>	<i>0</i>
<b># of Repetitions REST</b>	<i>0</i>	<b>Mask Pause</b>	<i>0</i>
<b># of Repetitions ACTIVE</b>	<i>0</i>		
<b>SAT</b>		<b>DIFFUSION</b>	
<b>Tag Type</b>	<i>None</i>	<b>Recon All Images</b>	<i>On</i>
<b>Fat/Water Saturation</b>	<i>Fat</i>		
<b>TRICKS</b>		<b>CONTRAST</b>	
<b>Pause On/Off</b>	<i>On</i>	<b>Contrast Yes/No</b>	<i>No</i>
<b>Auto Subtract</b>	<i>0</i>	<b>Contrast Amount</b>	<i>6</i>
<b>Auto SCIC</b>	<i>2</i>		

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## UCSF/Quest Protocol – Axial DWI

PATIENT POSITION		IMAGING PARAMETERS	
Patient Entry	<i>Head First</i>	Gradient Mode	<i>ZOOM</i>
Patient Position	<i>Supine</i>	Imaging Mode	<i>2D</i>
Coil Configuration	<i>8 Ch High Res Brain Array by MRI Devices</i>	Pulse Sequence	<i>Spin Echo</i>
Plane	<i>OBLIQUE</i>	Imaging Options	<i>EPI, DIFF, Asset</i>
Series Description	<i>Ax DWI 4MM B=1000</i>	n/a	<i>8</i>
SCAN TIMING		SCAN RANGE	
TE	<i>Minimum</i>	FOV	<i>25.6</i>
TR	<i>8000.0</i>	Slice Thickness	<i>4.0</i>
Number of Shots	<i>1</i>	Slice Spacing	<i>0.8</i>
		Start Location 1	<i>0.0</i>
		Start Location 2	<i>0.0</i>
		Start Location 3	<i>0.0</i>
		End Location 1	<i>0.0</i>
		End Location 2	<i>0.0</i>
		End Location 3	<i>S148.0</i>
		Number of Slices	<i>32</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Space per Plane 1	<i>0.0</i>
		Space per Plane 2	<i>0.0</i>
		Table Delta	<i>0.00</i>
IMAGE ENHANCE		ACQ TIMING	
Filter Choice	<i>None</i>	Freq	<i>160</i>
		Phase	<i>160</i>
		Freq DIR	<i>R/L</i>
		Phase FOV	<i>1.00</i>
		Auto Shim	<i>Auto</i>
		Phase Correction	<i>Yes</i>
GATING/TRIGGER		USER CVS	
Heart Beat per Minute Mode	<i>0</i>	User CV0	<i>1.00</i>
Auto Trigger Type	<i>Off</i>	User CV5	<i>1.00</i>
Auto Trigger Window	<i>Off</i>	User CV Mask	<i>262689</i>
FMRI		MULTI-PHASE	
PSD Trigger	<i>Internal</i>	# of Acquisition	<i>0</i>
Slice Order	<i>Interleaved</i>	Seperate Series	<i>0</i>

Ax DWI 4MM B=1000

Ax DWI 4MM B=1000

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Protocol: adult\_head\_QUEST11112015\_20151112135614257\_1

<b>View Order</b>	<i>Bottom/Up</i>	<b>Mask Phase</b>	<i>0</i>
<b># of Repetitions REST</b>	<i>0</i>	<b>Mask Pause</b>	<i>0</i>
<b># of Repetitions ACTIVE</b>	<i>0</i>		
<b>SAT</b>		<b>DIFFUSION</b>	
<b>Tag Type</b>	<i>None</i>	<b>Optimized TE</b>	<i>Yes</i>
<b>Fat/Water Saturation</b>	<i>Fat</i>	<b>Diffusion Directions</b>	<i>All</i>
		<b>Number of Diffusion</b>	<i>3</i>
		<b>Directions</b>	
		<b>Dual Spin Echo</b>	<i>Off</i>
		<b>Recon All Images</b>	<i>On</i>
<b>TRICKS</b>		<b>CONTRAST</b>	
<b>Pause On/Off</b>	<i>On</i>	<b>Contrast Yes/No</b>	<i>No</i>
<b>Auto Subtract</b>	<i>0</i>	<b>Contrast Amount</b>	<i>6</i>
<b>Auto SCIC</b>	<i>Off</i>		

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## UCSF/Quest Protocol – Coronal DWI

PATIENT POSITION		IMAGING PARAMETERS	
Patient Entry	<i>Head First</i>	Gradient Mode	<i>ZOOM</i>
Patient Position	<i>Supine</i>	Imaging Mode	<i>2D</i>
Coil Configuration	<i>8 Ch High Res Brain Array by MRI Devices</i>	Pulse Sequence	<i>Spin Echo</i>
Plane	<i>OBLIQUE</i>	Imaging Options	<i>EPI, DIFF, Asset</i>
Series Description	<i>Cor DWI 4MM B=1000</i>	n/a	<i>8</i>
SCAN TIMING		SCAN RANGE	
TE	<i>Minimum</i>	FOV	<i>25.6</i>
TR	<i>9000.0</i>	Slice Thickness	<i>4.0</i>
Number of Shots	<i>1</i>	Slice Spacing	<i>0.8</i>
		Start Location 1	<i>0.0</i>
		Start Location 2	<i>0.0</i>
		Start Location 3	<i>0.0</i>
		End Location 1	<i>0.0</i>
		End Location 2	<i>A168.0</i>
		End Location 3	<i>0.0</i>
		Number of Slices	<i>36</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Slice for 3 Plane Localizaion	<i>0</i>
		Space per Plane 1	<i>0.0</i>
		Space per Plane 2	<i>0.0</i>
		Table Delta	<i>0.00</i>
IMAGE ENHANCE		ACQ TIMING	
Filter Choice	<i>None</i>	Freq	<i>160</i>
		Phase	<i>160</i>
		Freq DIR	<i>S/I</i>
		Phase FOV	<i>1.00</i>
		Auto Shim	<i>Auto</i>
		Phase Correction	<i>Yes</i>
GATING/TRIGGER		USER CVS	
Heart Beat per Minute Mode	<i>0</i>	User CV0	<i>1.00</i>
Auto Trigger Type	<i>Off</i>	User CV5	<i>1.00</i>
Auto Trigger Window	<i>Off</i>	User CV Mask	<i>262689</i>
FMRI		MULTI-PHASE	
PSD Trigger	<i>Internal</i>	# of Acquisition	<i>0</i>
Slice Order	<i>Interleaved</i>	Seperate Series	<i>0</i>

Cor DWI 4MM B=1000

Cor DWI 4MM B=1000

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Protocol: adult\_head\_QUEST11112015\_20151112135614257\_1

<b>View Order</b>	<i>Bottom/Up</i>	<b>Mask Phase</b>	<i>0</i>
<b># of Repetitions REST</b>	<i>0</i>	<b>Mask Pause</b>	<i>0</i>
<b># of Repetitions ACTIVE</b>	<i>0</i>		
<b>SAT</b>		<b>DIFFUSION</b>	
<b>Tag Type</b>	<i>None</i>	<b>Optimized TE</b>	<i>Yes</i>
<b>Fat/Water Saturation</b>	<i>Fat</i>	<b>Diffusion Directions</b>	<i>All</i>
		<b>Number of Diffusion</b>	<i>3</i>
		<b>Directions</b>	
		<b>Dual Spin Echo</b>	<i>Off</i>
		<b>Recon All Images</b>	<i>On</i>
<b>TRICKS</b>		<b>CONTRAST</b>	
<b>Pause On/Off</b>	<i>On</i>	<b>Contrast Yes/No</b>	<i>No</i>
<b>Auto Subtract</b>	<i>0</i>	<b>Contrast Amount</b>	<i>6</i>
<b>Auto SCIC</b>	<i>Off</i>		

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# GE 3T

## UCSF/Quest Protocol - Survey

<b>PATIENT POSITION</b>		<b>IMAGING PARAMETERS</b>	
Patient Entry	Head First	Imaging Mode	2D
Patient Position	Supine	Pulse Sequence	Spin Echo
Coil Configuration	-1	Imaging Options	Seq, EDR, Fast, SS, ARC
Plane	3-PLANE	n/a	12
Series Description	LOCALIZER	<b>SCAN RANGE</b>	
<b>SCAN TIMING</b>		FOV	34.0
TE	Minimum	Slice Thickness	10.0
TR	Minimum	Slice Spacing	0.0
Receiver Bandwidth	62.50	Center Location 1	0.0
<b>IMAGE ENHANCE</b>		Center Location 2	A30.0
Filter Choice	None	Center Location 3	0.0
<b>GATING/TRIGGER</b>		Slice for 3 Plane Localizaion	0
Heart Beat per Minute Mode	0	Slice for 3 Plane Localizaion	9
Auto Trigger Type	Off	Slice for 3 Plane Localizaion	9
Auto Trigger Window	Off	Slice for 3 Plane Localizaion	9
<b>FMRI</b>		Space per Plane 1	0.0
PSD Trigger	Internal	Space per Plane 2	0.0
Slice Order	Interleaved	Table Delta	0.00
View Order	Bottom/Up	<b>ACQ TIMING</b>	
# of Repetitions REST	0	Freq	256
# of Repetitions ACTIVE	0	Phase	192
<b>SAT</b>		Freq DIR	Unswap
Tag Type	None	# of Acq. Before Pause	0
<b>TRICKS</b>		Phase FOV	1.00
Pause On/Off	On	Auto Shim	Auto
Auto Subtract	0	Phase Correction	No
Auto SCIC	Off	<b>USER CVS</b>	
<b>OTHERS</b>		User CV2	184.00
Protocol Notes	S/ fat sat on asset	User CV13	1.00
		In-range AutoTR Control	0
		User CV Mask	57414
		<b>MULTI-PHASE</b>	
		Seperate Series	0
		Mask Phase	0
		Mask Pause	0
		<b>DIFFUSION</b>	
		Recon All Images	On
		<b>CONTRAST</b>	
		Contrast Yes/No	No
		Contrast Amount	Yes

LOCALIZER

LOCALIZER

## UCSF/Quest Protocol – ASSET Calibration

PATIENT POSITION	
Patient Entry	Head First
Patient Position	Supine
Coil Configuration	-1
Plane	AXIAL
Series Description	ASSET calibration
SCAN TIMING	
Number of Echoes	1
IMAGE ENHANCE	
Filter Choice	None
GATING/TRIGGER	
Heart Beat per Minute Mode	0
Auto Trigger Type	Off
Auto Trigger Window	Off
FMRI	
PSD Trigger	Internal
Slice Order	Interleaved
View Order	Bottom/Up
# of Repetitions REST	0
# of Repetitions ACTIVE	0
SAT	
Tag Type	None
TRICKS	
Pause On/Off	On
Auto Subtract	0
Auto SCIC	Off

IMAGING PARAMETERS Imaging	
Mode	3D
Pulse Sequence	SPGR
Imaging Options	EDR, Fast, ZIP2, Calib
n/a	6
SCAN RANGE	
FOV	30.0
Slice Thickness	9.4
GRXOPT	0
Start Location 1	I133.7
End Location 1	S157.7
End Location 2	R8.0
End Location 3	A38.6
Center of Location Start	R8.0
Center of Location End	A38.6
Scan Locations	32
Number of Slices	1
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Space per Plane 1	0.0
Space per Plane 2	0.0
Table Delta	0.00
ACQ TIMING	
Freq DIR	R/L
Auto Shim	Auto
Phase Correction	No
USER CVS	
In-range AutoTR Control	0
User CV Mask	8388672
MULTI-PHASE	
Seperate Series	0
Mask Phase	0
Mask Pause	0
DIFFUSION	
Recon All Images	On
CONTRAST	
Contrast Yes/No	No
Contrast Amount	Yes

ASSET calibration

ASSET calibration

## UCSF/Quest Protocol – IR-FSPGR

<b>PATIENT POSITION</b>		<b>IMAGING PARAMETERS Imaging</b>	
Patient Entry	Head First	Mode	3D
Patient Position	Supine	Pulse Sequence	BRAVO
Coil Configuration	-1	Imaging Options	EDR, Fast, IrP
Plane	SAGITTAL	n/a	41
Series Description	3D SAG ADNI IR-SPGR	<b>SCAN RANGE</b>	
<b>SCAN TIMING</b>		FOV	25.6
Flip Angle	11	Slice Thickness	1.2
Number of Echoes	1	Location per Slab	200
TI	400	Overlap Locations	0
Receiver Bandwidth	31.25	GRXOPT	0
<b>IMAGE ENHANCE</b>		Start Location 1	L110.8
Filter Choice	None	End Location 1	R128.0
<b>GATING/TRIGGER</b>		End Location 2	A37.2
Heart Beat per Minute Mode	0	End Location 3	S7.3
Auto Trigger Type	Off	Center of Location Start	A37.2
Auto Trigger Window	Off	Center of Location End	S7.3
<b>FMRI</b>		Number of Slices	1
PSD Trigger	Internal	Slice for 3 Plane Localizaion	0
Slice Order	Interleaved	Slice for 3 Plane Localizaion	0
View Order	Bottom/Up	Slice for 3 Plane Localizaion	0
# of Repetitions REST	0	Slice for 3 Plane Localizaion	0
# of Repetitions ACTIVE	0	Space per Plane 1	0.0
<b>SAT</b>		Space per Plane 2	0.0
Tag Type	None	Table Delta	0.00
<b>TRICKS</b>		<b>ACQ TIMING</b>	
Pause On/Off	On	Freq	256
Auto Subtract	0	Phase	256
Auto SCIC	2	Freq DIR	S/I
		NEX	1.00
		Phase FOV	1.00
		Auto Shim	Auto
		Phase Correction	No
		<b>USER CVS</b>	
		In-range AutoTR Control	0
		User CV Mask	16
		<b>MULTI-PHASE</b>	
		Seperate Series	0
		Mask Phase	0
		Mask Pause	0
		<b>DIFFUSION</b>	
		Recon All Images	On
		<b>CONTRAST</b>	
		Contrast Yes/No	No
		Contrast Amount	Yes

3D SAG ADNI IR-SPGR

3D SAG ADNI IR-SPGR

## UCSF/Quest Protocol – Axial T2\*

<b>PATIENT POSITION</b>		<b>IMAGING PARAMETERS</b>	
Patient Entry	Head First	Imaging Mode	2D
Patient Position	Supine	Pulse Sequence	Gradient Echo
Coil Configuration	HD 8Ch High Res Brain Array by Invivo	Imaging Options	FC, EDR, SqP, ZIP512
Plane	OBLIQUE	n/a	0
Series Description	Ax T2*	<b>SCAN RANGE</b>	
<b>SCAN TIMING</b>		FOV	25.6
Flip Angle	20	Slice Thickness	4.0
TE	20.0	Slice Spacing	0.0
Number of Echoes	1	Start Location 1	R8.0
TR	650.0	Start Location 2	A26.4
Receiver Bandwidth	25.00	Start Location 3	I61.2
<b>IMAGE ENHANCE</b>		End Location 1	R8.0
Filter Choice	None	End Location 2	A50.9
<b>GATING/TRIGGER</b>		End Location 3	S109.0
Heart Beat per Minute Mode	0	Number of Slices	44
Auto Trigger Type	Off	Slice for 3 Plane Localizaion	0
Auto Trigger Window	Off	Slice for 3 Plane Localizaion	0
<b>FMRI</b>		Slice for 3 Plane Localizaion	0
PSD Trigger	Internal	Slice for 3 Plane Localizaion	0
Slice Order	Interleaved	Space per Plane 1	0.0
View Order	Bottom/Up	Space per Plane 2	0.0
# of Repetitions REST	0	Table Delta	0.00
# of Repetitions ACTIVE	0	<b>ACQ TIMING</b>	
<b>SAT</b>		Freq	256
Tag Type	None	Phase	224
<b>TRICKS</b>		Freq DIR	A/P
Pause On/Off	On	NEX	1.00
Auto Subtract	0	# of Acq. Before Pause	0
Auto SCIC	2	Auto Shim	Auto
		Phase Correction	No
		<b>USER CVS</b>	
		In-range AutoTR Control	0
		TR Min	200.0
		TR Max	11000.0
		User CV Mask	0
		<b>MULTI-PHASE</b>	
		Seperate Series	0
		Mask Phase	0
		Mask Pause	0
		<b>DIFFUSION</b>	
		Recon All Images	On
		<b>CONTRAST</b>	
		Contrast Yes/No	No
		Contrast Amount	Yes

Ax T2\*

Ax T2\*

## UCSF/Quest Protocol – Axial T2 FLAIR

T2 FLAIR ARC

T2 FLAIR ARC

### PATIENT POSITION

Patient Entry	Head First
Patient Position	Supine
Coil Configuration	HD 8Ch High Res Brain Array by Invivo
Plane	OBLIQUE
Series Description	T2 FLAIR ARC

### SCAN TIMING

Flip Angle	160
TE	90.0
Number of Echoes	1
TR	9000.0
TI	2474
Echo Train Length	16
Receiver Bandwidth	31.25

### IMAGE ENHANCE

Filter Choice	B
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### GATING/TRIGGER

Auto Trigger Type	Off
Auto Trigger Window	Off

### FMRI

PSD Trigger	Internal
Slice Order	Interleaved
View Order	Bottom/Up
# of Repetitions REST	0
# of Repetitions ACTIVE	0

### SAT

SAT Location	I
SAT Thickness	40.0
Tag Type	None

### TRICKS

Pause On/Off	On
Auto Subtract	0
Auto SCIC	2

### IMAGING PARAMETERS Imaging

Mode	2D
Pulse Sequence	T2flair
Imaging Options	EDR, TRF, Fast, ARC
n/a	25

### SCAN RANGE

FOV	25.6
Slice Thickness	4.0
Slice Spacing	0.0
GRXOPT	0
Start Location 1	R8.0
Start Location 2	A26.4
Start Location 3	I61.2
End Location 1	R8.0
End Location 2	A50.9
End Location 3	S109.0
Number of Slices	44
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Space per Plane 1	0.0
Space per Plane 2	0.0
Table Delta	0.00

### ACQ TIMING

Freq	256
Phase	256
Freq DIR	A/P
NEX	1.00
Phase FOV	0.88
Auto Shim	Auto
Phase Correction	No

### USER CVS

User CV5	1.00
User CV22	1.00
In-range AutoTR Control	0
User CV Mask	6325024

### MULTI-PHASE

Seperate Series	0
Mask Phase	0
Mask Pause	0

### DIFFUSION

Recon All Images	On
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### CONTRAST

Contrast Yes/No	No
Contrast Amount	Yes

## UCSF/Quest Protocol – Axial T2

### PATIENT POSITION

Patient Entry	Head First
Patient Position	Supine
Coil Configuration	HD 8Ch High Res Brain Array by Invivo
Plane	OBLIQUE
Series Description	Ax T2 FSE

### SCAN TIMING

Flip Angle	142
TE	80.0
Number of Echoes	1
TR	3000.0
Echo Train Length	16
Receiver Bandwidth	31.25

### IMAGE ENHANCE

Filter Choice	None
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### GATING/TRIGGER

Heart Beat per Minute Mode	0
Auto Trigger Type	Off
Auto Trigger Window	Off

### FMRI

PSD Trigger	Internal
Slice Order	Interleaved
View Order	Bottom/Up
# of Repetitions REST	0
# of Repetitions ACTIVE	0

### SAT

Tag Type	None
Fat/Water Saturation	Fat

### TRICKS

Pause On/Off	On
Auto Subtract	0
Auto SCIC	2

### IMAGING PARAMETERS

Imaging Mode	2D
Pulse Sequence	FRFSE-XL
Imaging Options	FC, EDR, TRF, Fast, ZIP512, FR
n/a	23

### SCAN RANGE

FOV	25.6
Slice Thickness	4.0
Slice Spacing	0.0
Start Location 1	R8.0
Start Location 2	A26.4
Start Location 3	I61.2
End Location 1	R8.0
End Location 2	A50.9
End Location 3	S109.0
Number of Slices	44
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Space per Plane 1	0.0
Space per Plane 2	0.0
Table Delta	0.00

### ACQ TIMING

Freq	256
Phase	256
Freq DIR	A/P
NEX	1.00
# of Acq. Before Pause	0
Phase FOV	0.88
Auto Shim	Auto
Phase Correction	Yes
Flow Direction Compensation	Freq

### USER CVS

User CV19	1.00
User CV22	1.00
In-range AutoTR Control	0
TR Min	2500.0
TR Max	11000.0
User CV Mask	6848960

### MULTI-PHASE

Seperate Series	0
Mask Phase	0
Mask Pause	0

### DIFFUSION

Recon All Images	On
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Ax T2 FSE

Ax T2 FSE

**CONTRAST**

<b>Contrast Yes/No</b>	<i>No</i>
<b>Contrast Amount</b>	<i>Yes</i>

## UCSF/Quest Protocol – Axial DWI

### PATIENT POSITION

Patient Entry	Head First
Patient Position	Supine
Coil Configuration	HD 8Ch High Res Brain Array by Invivo
Plane	AXIAL
Series Description	Ax DWI

### SCAN TIMING

TE	Minimum
Number of Echoes	1
TR	6000.0
Number of Shots	1

### IMAGE ENHANCE

Filter Choice	None
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### GATING/TRIGGER

Heart Beat per Minute Mode	0
Auto Trigger Type	Off
Auto Trigger Window	Off

### FMRI

PSD Trigger	Internal
Slice Order	Interleaved
View Order	Bottom/Up
# of Repetitions REST	0
# of Repetitions ACTIVE	0

### SAT

Tag Type	None
Fat/Water Saturation	Fat

### TRICKS

Pause On/Off	On
Auto Subtract	0
Auto SCIC	2

### IMAGING PARAMETERS

Imaging Mode	2D
Pulse Sequence	Spin Echo
Imaging Options	EDR, EPI, DIFF, Asset
n/a	8

### SCAN RANGE

FOV	25.6
Slice Thickness	4.0
Slice Spacing	0.8
GRXOPT	0
Start Location 1	I41.6
End Location 1	S107.2
End Location 2	R8.6
End Location 3	A40.6
Center of Location Start	R8.6
Center of Location End	A40.6
Number of Slices	32
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Space per Plane 1	0.0
Space per Plane 2	0.0
Table Delta	0.00

### ACQ TIMING

Freq	192
Phase	192
Freq DIR	R/L
Phase FOV	1.00
Auto Shim	Auto
Phase Correction	Yes

### USER CVS

User CV0	1.00
User CV5	1.00
User CV17	1.00
In-range AutoTR Control	0
User CV Mask	131745

### MULTI-PHASE

Seperate Series	0
Mask Phase	0
Mask Pause	0

### DIFFUSION

Optimized TE	Yes
Diffusion Directions	All
Number of Diffusion Directions	3
Number of T2 Images	1
Dual Spin Echo	Off
Recon All Images	On

Ax DWI

Ax DWI

**CONTRAST**

<b>Contrast Yes/No</b>	<i>No</i>
<b>Contrast Amount</b>	<i>Yes</i>

## UCSF/Quest Protocol – Coronal DWI

### PATIENT POSITION

Patient Entry	Head First
Patient Position	Supine
Coil Configuration	HD 8Ch High Res Brain Array by Invivo
Plane	CORONAL
Series Description	Cor DWI

### SCAN TIMING

TE	Minimum
TR	7500.0
Number of Shots	1

### IMAGE ENHANCE

Filter Choice	None
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### GATING/TRIGGER

Heart Beat per Minute Mode	0
Auto Trigger Type	Off
Auto Trigger Window	Off

### FMRI

PSD Trigger	Internal
Slice Order	Interleaved
View Order	Bottom/Up
# of Repetitions REST	0
# of Repetitions ACTIVE	0

### SAT

Tag Type	None
Fat/Water Saturation	Fat

### TRICKS

Pause On/Off	On
Auto Subtract	0
Auto SCIC	2

### IMAGING PARAMETERS

Imaging Mode	2D
Pulse Sequence	Spin Echo
Imaging Options	EDR, EPI, DIFF, Asset
n/a	8

### SCAN RANGE

FOV	25.6
Slice Thickness	4.0
Slice Spacing	0.8
Start Location 1	P50.7
End Location 1	A117.3
End Location 2	S21.3
End Location 3	R9.3
Center of Location Start	S21.3
Center of Location End	R9.3
Number of Slices	36
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Slice for 3 Plane Localizaion	0
Space per Plane 1	0.0
Space per Plane 2	0.0
Table Delta	0.00

### ACQ TIMING

Freq	192
Phase	192
Freq DIR	S/I
Phase FOV	1.00
Auto Shim	Auto
Phase Correction	Yes

### USER CVS

User CV0	1.00
User CV5	1.00
User CV17	1.00
In-range AutoTR Control	0
User CV Mask	393889

### MULTI-PHASE

Seperate Series	0
Mask Phase	0
Mask Pause	0

### DIFFUSION

Optimized TE	Yes
Diffusion Directions	All
Number of Diffusion Directions	3
Number of T2 Images	1
Dual Spin Echo	Off
Recon All Images	On

**CONTRAST**

<b>Contrast Yes/No</b>	<i>No</i>
<b>Contrast Amount</b>	<i>Yes</i>

# Philips 1.5T

## UCSF/Quest Survey

Coil selection = "Head";  
element selection = "123456";  
connection = "d";  
Dual coil = "no";  
Multi coil = "no";  
CLEAR = "no";  
FOV FH (mm) = 250;  
AP (mm) = 250;  
FOV (mm) = (3) 50, (17) 250;  
Voxel size FH (mm) = 0.9765625;  
AP (mm) = 1.953125;  
Slice thickness (mm) = 10;  
Bar orientation = "RL";  
VOI orientation = "transverse";  
VOI size AP (mm) = 30;  
RL (mm) = 30;  
FH (mm) = 30;  
Recon voxel size (mm) = 0.9765625;  
Fold-over suppression = "no";  
Reconstruction matrix = 256;  
SENSE = "no";  
k-t BLAST = "no";  
Stacks = 3;  
type = (20) "parallel";  
Slices = (3) 3, (17) 1;  
slice gap = "user defined";  
gap (mm) = (20) 10;  
Slice orientation = "sagittal",  
"coronal", (18)  
"transverse";  
Fold-over direction = "AP", (2) "RL",  
(17) "AP";  
Fat shift direction = (2) "F",  
"P", (17) "L";  
radial axis = "AP", "RL",  
"AP", (17) "RL";  
radial angle (deg) = (20) 0;  
Slice Offc. AP (P=+mm) = 0, (2) 20,  
(17) 0;  
RL (L=+mm) = (20) 0;  
FH (H=+mm) = (2) 0,  
-80, (17) 0;  
Ang. AP (deg) = (20) 0;  
RL (deg) = (20) 0;  
FH (deg) = (20) 0;  
VOI offc. AP (P=+mm) = 0;  
RL (L=+mm) = 0;  
FH (H=+mm) = 0;  
VOI ang. AP (deg) = 0;  
RL (deg) = 0;  
FH (deg) = 0;  
2nd VOI lat. offc. (mm) = 80;  
2nd VOI offc. axis = "AP";  
Slice scan order = "default";  
Stack scan order = "ascend";  
Move table per stack = "no";  
Large table movement = "no";

Stack alignment = "no";  
Stack display order = "no";  
PlanAlign = "no";  
REST slabs = 0;  
Catheter tracking = "no";  
Interactive positioning = "no";  
Patient position = "head first";  
orientation = "supine";  
Scan type = "Imaging";  
Scan mode = "M2D";  
technique = "FFE";  
Contrast enhancement = "T1";  
Acquisition mode = "cartesian";  
Fast Imaging mode = "TFE";  
shot mode = "multishot";  
TFE factor = 42;  
startup echoes = "default";  
shot interval = "shortest";  
profile order = "linear";  
Echoes = 1;  
partial echo = "no";  
shifted echo = "no";  
TE = "shortest";  
Flip angle (deg) = 20;  
TR = "user defined";  
(ms) = 15;  
Halfscan = "no";  
Water-fat shift = "maximum";  
Shim = "default";  
Fat suppression = "no";  
Water suppression = "no";  
TFE prepulse = "invert";  
slice selection = "no";  
shared = "no";  
delay = "shortest";  
PSIR = "no";  
MTC = "no";  
T2prep = "no";  
Diffusion mode = "no";  
SAR mode = "high";  
B1 mode = "default";  
PNS mode = "moderate";  
Gradient mode = "regular";  
SofTone mode = "no";  
Cardiac synchronization = "no";  
Heart rate > 250 bpm = "no";  
Respiratory compensation = "no";  
Navigator respiratory comp = "no";  
Flow compensation = "no";  
fMRI echo stabilisation = "no";  
Motion smoothing = "no";  
NSA = 1;  
Angio / Contrast enh. = "no";  
Quantitative flow = "no";  
Manual start = "no";  
Dynamic study = "no";  
Arterial Spin labeling = "no";  
Preparation phases = "auto";  
Interactive F0 = "no";  
B1 field map = "no";  
MIP/MPR = "no";  
Images = "M", (3) "no";

Autoview image = " M";  
Calculated images = (4) " no";  
Reference tissue = "White matter";  
Preset window contrast = "soft";  
Reconstruction mode = "immediate";  
Save raw data = "no";  
Hardcopy protocol = "no";  
Ringing filtering = "default";  
Geometry correction = "default";  
IF\_info\_seperator = 0;  
Total scan duration = "00:31.4";  
Rel. signal level (%) = 100;  
Act. TR/TE (ms) = "15 / 5.2";  
ACQ matrix M x P = "256 x 126";  
ACQ voxel MPS (mm) = "0.98 / 1.98 / 10.0";  
REC voxel MPS (mm) = "0.98 / 0.98 / 10.0";  
Scan percentage (%) = 49.21875;  
TFE shots = 3;  
TFE dur. shot / acq (ms) = "697.7 / 630.0";  
TFE shot interval (ms) = 697.661499;  
Min. TI delay = 373.136902;  
Act. WFS (pix) / BW (Hz) = "1.162 / 186.9";  
Min. WFS (pix) / Max. BW (Hz) = "0.522 / 415.8";  
Min. TR/TE (ms) = "10 / 5.2";  
SAR / whole body = "< 6 %";  
Whole body / level = "< 0.2 W/kg / normal";  
B1 rms = "1.12 uT";  
PNS / level = "16 % / normal";  
Sound Pressure Level (dB) = -3.4767971;

# UCSF/Quest MP-RAGE

Coil selection =	"Head";	partial echo =	"no";
element selection =	"123456";	shifted echo =	"no";
connection =	"d";	TE =	"user defined";
Dual coil =	"no";	(ms) =	4;
Homogeneity correction =	"none";	Flip angle (deg) =	8;
CLEAR =	"yes";	TR =	"shortest";
body tuned =	"no";	Halfscan =	"no";
FOV		Water-fat shift =	"maximum";
FH (mm) =	240;	Shim =	"auto";
AP (mm) =	240;	Fat suppression =	"no";
RL (mm) =	204.000015;	Water suppression =	"no";
Voxel size		TFE prepulse =	"invert";
FH (mm) =	1.25;	slice selection =	"no";
AP (mm) =	1.25;	delay =	"user defined";
RL (mm) =	1.20000005;	(ms) =	1000;
Recon voxel size (mm) =	1;	PSIR =	"no";
Fold-over suppression =	"no";	MTC =	"no";
Slice oversampling =	"user defined";	T2prep =	"no";
oversample factor =	1.10000002;	Research prepulse =	"no";
RF select. FOS =	"no";	Diffusion mode =	"no";
Reconstruction matrix =	240;	SAR mode =	"high";
SENSE =		B1 mode =	"default";
k-t BLAST =	"no";	PNS mode =	"moderate";
Overcontiguous slices =	"no";	Gradient mode =	"default";
Stacks =	1;	SofTone mode =	"no";
slices =	170;	Cardiac synchronization =	"no";
slice orientation =	"sagittal";	Heart rate > 250 bpm =	"no";
fold-over direction =	"AP";	Respiratory compensation =	"no";
fat shift direction =	"F";	Navigator respiratory comp =	"no";
Stack Offc. AP (P=+mm) =	-0.496321857;	Flow compensation =	"no";
RL (L=+mm) =	1.41061175;	fMRI echo stabilisation =	"no";
FH (H=+mm) =	-66.9705124;	Motion smoothing =	"no";
Ang. AP (deg) =	2.82272959;	NSA =	1;
RL (deg) =	9.18244553;	Angio / Contrast enh. =	"no";
FH (deg) =	-0.52383393;	Quantitative flow =	"no";
Chunks =	1;	CENTRA =	"no";
Large table movement =	"no";	Manual start =	"no";
PlanAlign =	"no";	Dynamic study =	"no";
REST slabs =	0;	Arterial Spin labeling =	"no";
Catheter tracking =	"no";	Preparation phases =	"auto";
Interactive positioning =	"no";	Interactive F0 =	"no";
Allow table movement =	"no";	B0 field map =	"no";
Patient position =	"head first";	B1 field map =	"no";
orientation =	"supine";	MIP/MPR =	"no";
Scan type =	"Imaging";	Images =	" M", (3) " no";
Scan mode =	"3D";	Autoview image =	" M";
technique =	"FFE";	Calculated images =	(4) " no";
Contrast enhancement =	"T1";	Reference tissue =	"Grey matter";
Acquisition mode =	"cartesian";	Preset window contrast =	"soft";
Fast Imaging mode =	"TFE";	Reconstruction mode =	"immediate";
3D non-selective =	"no";	Save raw data =	"no";
shot mode =	"multishot";	Hardcopy protocol =	"no";
TFE factor =	192;	Ringing filtering =	"default";
3D free factor =	"no";	Geometry correction =	"default";
startup echoes =	"default";	Elliptical k-space shutter =	"default";
shot interval =	"user defined";	IF_info_seperator =	0;
(ms) =	2300;	Total scan duration =	"07:11.9";
profile order =	"linear";	Rel. signal level (%) =	100;
turbo direction =	"Y";	Act. TR/TE (ms) =	"8.5 / 4.0";
Echoes =	1;	ACQ matrix M x P =	"192 x 192";
		ACQ voxel MPS (mm) =	"1.25 / 1.25 / 1.20";
		REC voxel MPS (mm) =	"1.00 / 1.00 / 1.20";

Scan percentage (%) = 100;  
TFE shots = 187;  
TFE dur. shot / acq (ms) = "1826.1 / 1638.6";  
Min. TI delay = 856.297791;  
Act. WFS (pix) / BW (Hz) = "1.270 / 171.0";  
Min. WFS (pix) / Max. BW (Hz) = "0.209 / 1041.7";  
Min. TR/TE (ms) = "8.5 / 3.2";  
SAR / whole body = "< 3 %";  
Whole body / level = "< 0.1 W/kg / normal";  
B1 rms = "0.75 uT";  
PNS / level = "54 % / normal";  
Sound Pressure Level (dB) = 11.7563028;

## UCSF/Quest T2\*

Coil selection =	"Head";	(pixels) =	2.70000005;
element selection =	"123456";	Shim =	"default";
connection =	"d";	Fat suppression =	"no";
Dual coil =	"no";	Water suppression =	"no";
Homogeneity correction =	"none";	MTC =	"no";
CLEAR =	"yes";	Research prepulse =	"no";
body tuned =	"no";	Diffusion mode =	"no";
FOV AP (mm) =	256;	SAR mode =	"low";
RL (mm) =	224;	B1 mode =	"default";
FH (mm) =	176;	PNS mode =	"low";
Voxel size AP (mm) =	1.33000004;	Gradient mode =	"default";
RL (mm) =	1.33333337;	SofTone mode =	"no";
Slice thickness (mm) =	4;	Cardiac synchronization =	"no";
Recon voxel size (mm) =	0.939999998;	Heart rate > 250 bpm =	"no";
Fold-over suppression =	"no";	Respiratory compensation =	"no";
Reconstruction matrix =	288;	Navigator respiratory comp =	"no";
SENSE =	"no";	Flow compensation =	"yes";
k-t BLAST =	"no";	Temporal slice spacing =	"default";
Stacks =	1;	fMRI echo stabilisation =	"no";
type =	"parallel";	NSA =	1;
slices =	44;	Angio / Contrast enh. =	"no";
slice gap =	"user defined";	Quantitative flow =	"no";
gap (mm) =	0;	Manual start =	"no";
slice orientation =	"transverse";	Dynamic study =	"no";
fold-over direction =	"RL";	Arterial Spin labeling =	"no";
fat shift direction =	"P";	Preparation phases =	"auto";
Stack Offc. AP (P=+mm) =	-0.496321857;	Interactive F0 =	"no";
RL (L=+mm) =	1.41061175;	B0 field map =	"no";
FH (H=+mm) =	-66.9705124;	B1 field map =	"no";
Ang. AP (deg) =	2.82272959;	MIP/MPR =	"no";
RL (deg) =	9.18244553;	Images =	" M", (3) " no";
FH (deg) =	-0.52383393;	Autoview image =	" M";
Minimum number of packages =	1;	Calculated images =	(4) " no";
Slice scan order =	"default";	Reference tissue =	"White matter";
Large table movement =	"no";	Preset window contrast =	"soft";
PlanAlign =	"no";	Reconstruction mode =	"immediate";
REST slabs =	0;	Save raw data =	"no";
Catheter tracking =	"no";	Hardcopy protocol =	"no";
Interactive positioning =	"no";	Ringing filtering =	"default";
Allow table movement =	"no";	Geometry correction =	"default";
Patient position =	"head first";	IF_info_seperator =	0;
orientation =	"supine";	Total scan duration =	"05:31.5";
Scan type =	"Imaging";	Rel. signal level (%) =	100;
Scan mode =	"MS";	Act. TR/TE (ms) =	"650 / 30";
technique =	"FFE";	ACQ matrix M x P =	"192 x 168";
Contrast enhancement =	"no";	ACQ voxel MPS (mm) =	"1.33 / 1.33 / 4.00";
Acquisition mode =	"cartesian";	REC voxel MPS (mm) =	"0.89 / 0.89 / 4.00";
Fast Imaging mode =	"none";	Scan percentage (%) =	100;
Echoes =	1;	Packages =	3;
partial echo =	"no";	Min. slice gap (mm) =	0;
shifted echo =	"no";	Optimal slices =	16;
TE =	"user defined";	Max. slices =	48;
(ms) =	30;	Act. WFS (pix) / BW (Hz) =	"2.695 / 80.6";
Flip angle (deg) =	20;	Min. WFS (pix) / Max. BW (Hz) =	"0.319 / 681.2";
TR =	"user defined";	Min. TR/TE (ms) =	"580 / 6.7";
(ms) =	650;	SAR / whole body =	" 0 %";
Halfscan =	"no";	Whole body / level =	"0.0 W/kg / normal";
Water-fat shift =	"user defined";	B1 rms =	"0.23 uT";
		PNS / level =	"9 % / normal";
		Sound Pressure Level (dB) =	-9.25968838;

# UCSF/Quest T2 FLAIR

Coil selection =	"Head";	(ms) =	90;
element selection =	"123456";	Refocusing control =	"yes";
connection =	"d";	angle (deg) =	90;
Dual coil =	"no";	TR =	"user defined";
CLEAR =	"yes";	(ms) =	9000;
body tuned =	"no";	Halfscan =	"no";
FOV AP (mm) =	256;	Water-fat shift =	"maximum";
RL (mm) =	224;	IR delay (ms) =	2200;
FH (mm) =	176;	acquire during delay =	"yes";
Voxel size AP (mm) =	1;	dual =	"no";
RL (mm) =	1;	power =	"1";
Slice thickness (mm) =	4;	Shim =	"default";
Recon voxel size (mm) =	0.9375;	Fat suppression =	"no";
Fold-over suppression =	"no";	Water suppression =	"no";
Reconstruction matrix =	288;	MTC =	"no";
SENSE =	"yes";	Silicone Only Sequence =	"no";
P reduction (RL) =	2;	T2prep =	"no";
P os factor =	1;	Research prepulse =	"no";
k-t BLAST =	"no";	Zoom imaging =	"no";
Stacks =	1;	Diffusion mode =	"no";
type =	"parallel";	SAR mode =	"moderate";
slices =	44;	B1 mode =	"default";
slice gap =	"user defined";	PNS mode =	"low";
gap (mm) =	0;	Gradient mode =	"default";
slice orientation =	"transverse";	SofTone mode =	"no";
fold-over direction =	"RL";	Cardiac synchronization =	"no";
fat shift direction =	"P";	Heart rate > 250 bpm =	"no";
Stack Offc. AP (P=+mm) =	-0.496321857;	Respiratory compensation =	"no";
RL (L=+mm) =	1.41061175;	Navigator respiratory comp =	"no";
FH (H=+mm) =	-66.9705124;	Flow compensation =	"no";
Ang. AP (deg) =	2.82272959;	Motion smoothing =	"no";
RL (deg) =	9.18244553;	NSA =	1;
FH (deg) =	-0.52383393;	Manual start =	"no";
Minimum number of packages =	3;	Dynamic study =	"no";
Slice scan order =	"default";	Arterial Spin labeling =	"no";
Large table movement =	"no";	Preparation phases =	"auto";
PlanAlign =	"no";	Interactive F0 =	"no";
REST slabs =	0;	B0 field map =	"no";
Catheter tracking =	"no";	B1 field map =	"no";
Interactive positioning =	"no";	MIP/MPR =	"no";
Allow table movement =	"no";	Images =	" M", (3) " no";
Patient position =	"head first";	Autoview image =	" M";
orientation =	"supine";	Reference tissue =	"White matter";
Scan type =	"Imaging";	Preset window contrast =	"soft";
Scan mode =	"MS";	Reconstruction mode =	"real time";
technique =	"IR";	Save raw data =	"no";
Acquisition mode =	"cartesian";	Hardcopy protocol =	"no";
Fast Imaging mode =	"TSE";	Ringing filtering =	"default";
shot mode =	"multishot";	Geometry correction =	"default";
TSE factor =	16;	IF_info_seperator =	0;
startup echoes =	0;	Total scan duration =	"03:36.0";
profile order =	"linear";	Rel. signal level (%) =	100;
DRIVE =	"no";	Act. TR/TI (ms) =	"9000 / 2200";
ultrashort =	"no";	Act. TE (ms) =	"90";
strong FID crushing =	"no";	ACQ matrix M x P =	"256 x 218";
Echoes =	1;	ACQ voxel MPS (mm) =	"1.00 / 1.03 / 4.00";
partial echo =	"no";	REC voxel MPS (mm) =	"0.89 / 0.89 / 4.00";
TE =	"user defined";	Scan percentage (%) =	97.391304;
		Packages =	3;
		Min. slice gap (mm) =	0.80000012;
		Optimal slices =	30;
		Max. slices =	45;

WFS (pix) / BW (Hz) = "1.157 / 187.8";  
TSE es / shot (ms) = "10.6 / 169";  
TEeff / TEequiv (ms) = "90 / 69";  
Min. TR/TI (ms) = "5162 / 50";  
SAR / whole body = "< 13 %";  
Whole body / level = "< 0.5 W/kg / normal";  
B1 rms = "1.66 uT";  
PNS / level = "32 % / normal";  
Sound Pressure Level (dB) = 9.06399822;

## UCSF/Quest T2 TSE

Coil selection =	"Head";	TE =	"user defined";
element selection =	"123456";	(ms) =	90;
connection =	"d";	Flip angle (deg) =	90;
Dual coil =	"no";	Refocusing control =	"yes";
Homogeneity correction =	"none";	angle (deg) =	100;
CLEAR =	"yes";	TR =	"user defined";
body tuned =	"no";	(ms) =	3000;
FOV  AP (mm) =	256;	Halfscan =	"no";
RL (mm) =	224;	Water-fat shift =	"maximum";
FH (mm) =	176;	Shim =	"default";
Voxel size  AP (mm) =	1;	Fat suppression =	"SPIR";
RL (mm) =	1;	strength =	"strong";
Slice thickness (mm) =	4;	frequency offset =	"default";
Recon voxel size (mm) =	1;	Water suppression =	"no";
Small FOV imaging =	"no";	BB pulse =	"no";
Fold-over suppression =	"no";	MTC =	"no";
Reconstruction matrix =	256;	T2prep =	"no";
SENSE =	"no";	Research prepulse =	"no";
k-t BLAST =	"no";	Zoom imaging =	"no";
Stacks =	1;	Diffusion mode =	"no";
type =	"parallel";	SAR mode =	"high";
slices =	44;	B1 mode =	"default";
slice gap =	"user defined";	PNS mode =	"low";
gap (mm) =	0;	Gradient mode =	"default";
slice orientation =	"transverse";	SoftTone mode =	"no";
fold-over direction =	"RL";	Cardiac synchronization =	"no";
fat shift direction =	"P";	Heart rate > 250 bpm =	"no";
Stack Offc. AP (P=+mm) =	-0.496321857;	Respiratory compensation =	"no";
RL (L=+mm) =	1.41061175;	Navigator respiratory comp =	"no";
FH (H=+mm) =	-66.9705124;	Flow compensation =	"no";
Ang. AP (deg) =	2.82272959;	Temporal slice spacing =	"default";
RL (deg) =	9.18244553;	Motion smoothing =	"no";
FH (deg) =	-0.52383393;	NSA =	1;
Minimum number of packages =	2;	Manual start =	"no";
Slice scan order =	"default";	Dynamic study =	"no";
Large table movement =	"no";	Arterial Spin labeling =	"no";
PlanAlign =	"no";	Preparation phases =	"auto";
REST slabs =	0;	Interactive F0 =	"no";
Catheter tracking =	"no";	B0 field map =	"no";
Interactive positioning =	"no";	B1 field map =	"no";
Allow table movement =	"no";	MIP/MPR =	"no";
Patient position =	"head first";	Images =	" M", (3) " no";
orientation =	"supine";	Autoview image =	" M";
Scan type =	"Imaging";	Calculated images =	(4) " no";
Scan mode =	"MS";	Reference tissue =	"White matter";
technique =	"SE";	Preset window contrast =	"soft";
Modified SE =	"no";	Reconstruction mode =	"immediate";
Acquisition mode =	"cartesian";	Save raw data =	"no";
Fast Imaging mode =	"TSE";	Hardcopy protocol =	"no";
shot mode =	"multishot";	Ringing filtering =	"default";
TSE factor =	16;	Geometry correction =	"default";
startup echoes =	0;	IF_info_seperator =	1634755923;
profile order =	"linear";	Total scan duration =	"02:15.0";
DRIVE =	"no";	Rel. signal level (%) =	100;
ultrashort =	"no";	Act. TR (ms) =	"3000";
strong FID crushing =	"no";	Act. TE (ms) =	"90";
Echoes =	1;	ACQ matrix M x P =	"256 x 224";
partial echo =	"no";	ACQ voxel MPS (mm) =	"1.00 / 1.00 / 4.00";
		REC voxel MPS (mm) =	"1.00 / 1.00 / 4.00";
		Scan percentage (%) =	100;
		Packages =	3;
		Min. slice gap (mm) =	0;

Optimal slices = 15;  
Max. slices = 45;  
WFS (pix) / BW (Hz) = "1.193 / 182.1";  
TSE es / shot (ms) = "10.6 / 169";  
TEeff / TEequiv (ms) = "90 / 73";  
Min. TR (ms) = "2966";  
SAR / whole body = "< 38 %";  
Whole body / level = "< 1.5 W/kg / normal";  
B1 rms = "2.81 uT";  
PNS / level = "46 % / normal";  
Sound Pressure Level (dB) = 9.9265461;

## UCSF/Quest Axial DWI

Coil selection =	"Head";	Water-fat shift =	"minimum";
element selection =	"123456";	Shim =	"auto";
connection =	"d";	Fat suppression =	"SPIR";
Dual coil =	"no";	strength =	"strong";
CLEAR =	"yes";	frequency offset =	"default";
body tuned =	"no";	Water suppression =	"no";
FOV		BB pulse =	"no";
RL (mm) =	256;	MTC =	"no";
AP (mm) =	256;	Research prepulse =	"no";
FH (mm) =	152.800003;	Diffusion mode =	"DWI";
Voxel size		sequence =	"SE";
RL (mm) =	1.60000002;	gradient duration =	"maximum";
AP (mm) =	1.60000002;	gradient overplus =	"no";
Slice thickness (mm) =	4;	direction =	"M", "P", "S";
Recon voxel size (mm) =	1;	nr of b-factors =	2;
Small FOV imaging =	"no";	b-factor order =	"ascending";
Fold-over suppression =	"no";	max b-factor =	1000;
Reconstruction matrix =	256;	average high b =	"no";
SENSE =	"yes";	SAR mode =	"high";
P reduction (AP) =	2;	B1 mode =	"default";
P os factor =	1;	PNS mode =	"high";
k-t BLAST =	"no";	Gradient mode =	"default";
Stacks =	1;	SofTone mode =	"no";
type =	"parallel";	Cardiac synchronization =	"no";
slices =	32;	Heart rate > 250 bpm =	"no";
slice gap =	"user defined";	Respiratory compensation =	"no";
gap (mm) =	0.800000191;	Navigator respiratory comp =	"no";
slice orientation =	"transverse";	Flow compensation =	"no";
fold-over direction =	"AP";	Temporal slice spacing =	"default";
fat shift direction =	"P";	NSA =	3;
Stack Offc. AP (P=+mm) =	-0.496321857;	SMART =	"no";
RL (L=+mm) =	1.41061175;	Manual start =	"no";
FH (H=+mm) =	-66.9705124;	Dynamic study =	"no";
Ang. AP (deg) =	2.82272959;	Arterial Spin labeling =	"no";
RL (deg) =	9.18244553;	Preparation phases =	"auto";
FH (deg) =	-0.52383393;	Interactive F0 =	"no";
Minimum number of packages =	1;	B0 field map =	"no";
Slice scan order =	"default";	B1 field map =	"no";
Large table movement =	"no";	MIP/MPR =	"no";
PlanAlign =	"no";	Images =	" M", (3) " no";
REST slabs =	0;	Autoview image =	" M";
Catheter tracking =	"no";	Calculated images =	(4) " no";
Interactive positioning =	"no";	Reference tissue =	"White matter";
Allow table movement =	"no";	EPI 2D phase correction =	"no";
Patient position =	"head first";	Preset window contrast =	"soft";
orientation =	"supine";	Reconstruction mode =	"immediate";
Scan type =	"Imaging";	Save raw data =	"no";
Scan mode =	"MS";	Hardcopy protocol =	"no";
technique =	"SE";	Ring filtering =	"default";
Modified SE =	"no";	Geometry correction =	"default";
Acquisition mode =	"cartesian";	IF_info_seperator =	1634755923;
Fast Imaging mode =	"EPI";	Total scan duration =	"01:31.2";
shot mode =	"single-shot";	Rel. signal level (%) =	100;
Echoes =	1;	Act. TR (ms) =	"6513";
partial echo =	"no";	Act. TE (ms) =	"100";
TE =	"shortest";	ACQ matrix M x P =	"160 x 160";
Flip angle (deg) =	90;	ACQ voxel MPS (mm) =	"1.60 / 1.60 / 4.00";
TR =	"shortest";	REC voxel MPS (mm) =	"1.00 / 1.00 / 4.00";
Halfscan =	"yes";	Scan percentage (%) =	100;
factor =	0.698795199;	Packages =	1;
		Min. slice gap (mm) =	0;
		EPI factor =	83;

WFS (pix) / BW (Hz) = "18.596 / 11.7";  
BW in EPI freq. dir. (Hz) = "1249.1";  
SAR / whole body = "< 5 %";  
Whole body / level = "< 0.2 W/kg / normal";  
B1 rms = "0.96 uT";  
PNS / level = "66 % / normal";  
Sound Pressure Level (dB) = 10.3647041;

## UCSF/Quest Coronal DWI

Coil selection =	"Head";	Water-fat shift =	"minimum";
element selection =	"123456";	Shim =	"auto";
connection =	"d";	Fat suppression =	"SPIR";
Dual coil =	"no";	strength =	"strong";
CLEAR =	"yes";	frequency offset =	"default";
body tuned =	"no";	Water suppression =	"no";
FOV  FH (mm) =	256;	BB pulse =	"no";
RL (mm) =	256;	MTC =	"no";
AP (mm) =	172;	Research prepulse =	"no";
Voxel size  FH (mm) =	1.60000002;	Diffusion mode =	"DWI";
RL (mm) =	1.60000002;	sequence =	"SE";
Slice thickness (mm) =	4;	gradient duration =	"maximum";
Recon voxel size (mm) =	1;	gradient overplus =	"no";
Small FOV imaging =	"no";	direction =	"M", "P", "S";
Fold-over suppression =	"no";	nr of b-factors =	2;
Reconstruction matrix =	256;	b-factor order =	"ascending";
SENSE =	"yes";	max b-factor =	1000;
P reduction (RL) =	2;	average high b =	"no";
P os factor =	1;	SAR mode =	"high";
k-t BLAST =	"no";	B1 mode =	"default";
Stacks =	1;	PNS mode =	"high";
type =	"parallel";	Gradient mode =	"default";
slices =	36;	SofTone mode =	"no";
slice gap =	"user defined";	Cardiac synchronization =	"no";
gap (mm) =	0.800000191;	Heart rate > 250 bpm =	"no";
slice orientation =	"coronal";	Respiratory compensation =	"no";
fold-over direction =	"RL";	Navigator respiratory comp =	"no";
fat shift direction =	"L";	Flow compensation =	"no";
Stack Offc. AP (P=+mm) =	-0.496321857;	Temporal slice spacing =	"default";
RL (L=+mm) =	1.41061175;	NSA =	3;
FH (H=+mm) =	-66.9705124;	SMART =	"no";
Ang. AP (deg) =	2.82272959;	Manual start =	"no";
RL (deg) =	9.18244553;	Dynamic study =	"no";
FH (deg) =	-0.52383393;	Arterial Spin labeling =	"no";
Minimum number of packages =	1;	Preparation phases =	"auto";
Slice scan order =	"default";	Interactive F0 =	"no";
Large table movement =	"no";	B0 field map =	"no";
PlanAlign =	"no";	B1 field map =	"no";
REST slabs =	0;	MIP/MPR =	"no";
Catheter tracking =	"no";	Images =	" M", (3) " no";
Interactive positioning =	"no";	Autoview image =	" M";
Allow table movement =	"no";	Calculated images =	(4) " no";
Patient position =	"head first";	Reference tissue =	"White matter";
orientation =	"supine";	EPI 2D phase correction =	"no";
Scan type =	"Imaging";	Preset window contrast =	"soft";
Scan mode =	"MS";	Reconstruction mode =	"immediate";
technique =	"SE";	Save raw data =	"no";
Modified SE =	"no";	Hardcopy protocol =	"no";
Acquisition mode =	"cartesian";	Ring filtering =	"default";
Fast Imaging mode =	"EPI";	Geometry correction =	"default";
shot mode =	"single-shot";	IF_info_seperator =	1634755923;
Echoes =	1;	Total scan duration =	"01:39.5";
partial echo =	"no";	Rel. signal level (%) =	100;
TE =	"shortest";	Act. TR (ms) =	"7104";
Flip angle (deg) =	90;	Act. TE (ms) =	"101";
TR =	"shortest";	ACQ matrix M x P =	"160 x 160";
Halfscan =	"yes";	ACQ voxel MPS (mm) =	"1.60 / 1.60 / 4.00";
factor =	0.698795199;	REC voxel MPS (mm) =	"1.00 / 1.00 / 4.00";
		Scan percentage (%) =	100;
		Packages =	1;
		Min. slice gap (mm) =	0;
		Diffusion gradient timing DELTA / delta (ms) =	

EPI factor = "51.0 / 27.5";  
83;  
WFS (pix) / BW (Hz) = "18.596 / 11.7";  
BW in EPI freq. dir. (Hz) = "1249.1";  
SAR / whole body = "< 5 %";  
Whole body / level = "< 0.2 W/kg / normal";  
B1 rms = "0.98 uT";  
PNS / level = "50 % / normal";  
Sound Pressure Level (dB) = 9.92135143;

# Philips 3T

## UCSF/Quest Survey

Uniformity =	"Classic";	shot mode =	"multishot";
FOV FH (mm) =	300;	TFE factor =	64;
AP (mm) =	300;	startup echoes =	"default";
FOV (mm) =	(20) 50;	shot interval =	"shortest";
Voxel size FH (mm) =	0.976562977;	profile order =	"linear";
AP (mm) =	1.953125;	Echoes =	1;
Slice thickness (mm) =	10;	partial echo =	"no";
Bar orientation =	"RL";	shifted echo =	"no";
VOI orientation =	"transverse";	TE =	"in-phase";
VOI size AP (mm) =	30;	(ms) =	4.60383224;
RL (mm) =	30;	Flip angle (deg) =	15;
FH (mm) =	30;	TR =	"user defined";
Recon voxel size (mm) =	0.9375;	(ms) =	11;
Fold-over suppression =	"no";	Halfscan =	"no";
P (mm) =	50;	Water-fat shift =	"user defined";
A (mm) =	50;	(pixels) =	3.5;
Reconstruction matrix =	320;	RF Shims =	"fixed";
SENSE =	"no";	Shim =	"default";
k-t BLAST =	"no";	mDIXON =	"no";
Stacks =	3;	Fat suppression =	"no";
type =	(20) "parallel";	Water suppression =	"no";
Slices =	(20) 3;	TFE prepulse =	"invert";
slice gap =	"user defined";	slice selection =	"no";
gap (mm) =	(20) 10;	shared =	"no";
Slice orientation =	"sagittal",	delay =	"user defined";
	"coronal", (18)	(ms) =	800;
	"transverse";	PSIR =	"no";
Fold-over direction =	"AP", (19) "RL";	MTC =	"no";
Fat shift direction =	(2) "F",	T2prep =	"no";
	(18) "P";	Diffusion mode =	"no";
radial axis =	"AP", "RL",	SAR mode =	"high";
	"AP", (17) "RL";	B1 mode =	"default";
radial angle (deg) =	(20) 0;	PNS mode =	"low";
Slice Offc. AP (P=+mm) =	(20) 0;	Gradient mode =	"default";
RL (L=+mm) =	(20) 0;	Softone mode =	"no";
FH (H=+mm) =	(20) 0;	Cardiac synchronization =	"no";
Ang. AP (deg) =	(20) 0;	Respiratory compensation =	"no";
RL (deg) =	(20) -0;	Navigator respiratory comp =	"no";
FH (deg) =	(20) -0;	Flow compensation =	"no";
Slice scan order =	"default";	fMRI echo stabilisation =	"no";
Stack scan order =	"ascend";	NSA =	1;
Move table per stack =	"no";	Angio / Contrast enh. =	"no";
Large table movement =	"no";	Quantitative flow =	"no";
Stack alignment =	"no";	Manual start =	"no";
Stack display order =	"no";	Dynamic study =	"no";
PlanAlign =	"no";	Arterial Spin labeling =	"no";
REST slabs =	0;	Preparation phases =	"auto";
Interactive positioning = "no";		Interactive F0 =	"no";
Patient position =	"head first";	B0 field map =	"no";
orientation =	"supine";	MIP/MPR =	"no";
Scan type =	"Imaging";	SWIp =	"no";
Scan mode =	"M2D";	Images =	"M", (3) "no";
technique =	"FFE";	Autoview image =	"M";
Contrast enhancement =	"T1";	Calculated images =	(4) "no";
Acquisition mode =	"cartesian";	Reference tissue =	"White matter";
Fast Imaging mode =	"TFE";	Recon compression =	"No";
		Preset window contrast =	"soft";
		Reconstruction mode =	"immediate";
		Save raw data =	"no";
		Hardcopy protocol =	"no";
		Image filter =	"system default";
		Geometry correction =	"default";

IF\_info\_seperator = 1634755923;  
Total scan duration = "00:31.5";  
Rel. SNR = 1;  
Act. TR/TE (ms) = "11 / 4.6";  
ACQ matrix M x P = "308 x 128";  
ACQ voxel MPS (mm) = "0.97 / 2.34 / 10.0";  
REC voxel MPS (mm) = "0.94 / 0.94 / 10.0";  
Scan percentage (%) = 41.5584412;  
TFE shots = 2;  
TFE dur. shot / acq (ms) = "1165.5 / 704.0";  
TFE shot interval (ms) = 1165.52527;  
Min. TI delay = 400.447815;  
Act. WFS (pix) / BW (Hz) = "3.099 / 140.2";  
Min. WFS (pix) / Max. BW (Hz) = "0.674 / 644.2";  
Min. TR/TE (ms) = "9.4 / 3.7";  
SAR / local torso = "< 16 %";  
Whole body / level = "< 0.5 W/kg / normal";  
SED = " 0.0 kJ/kg";  
B1+rms / Coil Power = "0.92 uT / 16 %";  
Max B1+rms = "0.92 uT";  
PNS / level = "52 % / normal";  
dB/dt = "43.9 T/s";  
Sound Pressure Level (dB) = 17.918438;

## UCSF/Quest MP-RAGE

SmartSelect =	"yes";	mDIXON =	"no";
Coil 1 (exclude) =	"None";	Fat suppression =	"no";
Uniformity =	"CLEAR";	Water suppression =	"no";
FOV		TFE prepulse =	"invert";
FH (mm) =	256;	slice selection =	"no";
AP (mm) =	240;	delay =	"user defined";
RL (mm) =	204.000015;	(ms) =	900;
Voxel size		PSIR =	"no";
FH (mm) =	1;	MTC =	"no";
AP (mm) =	1;	T2prep =	"no";
RL (mm) =	1.20000005;	Diffusion mode =	"no";
Recon voxel size (mm) =	1;	SAR mode =	"high";
Fold-over suppression =	"no";	B1 mode =	"default";
Slice oversampling =	"default";	PNS mode =	"moderate";
Reconstruction matrix =	256;	Gradient mode =	"default";
SENSE =	"no";	SofTone mode =	"no";
k-t BLAST =	"no";	Cardiac synchronization =	"no";
Overcontiguous slices =	"no";	Respiratory compensation =	"no";
Stacks =	1;	Navigator respiratory comp =	"no";
slices =	170;	Flow compensation =	"no";
slice orientation =	"sagittal";	fMRI echo stabilisation =	"no";
fold-over direction =	"AP";	NSA =	1;
fat shift direction =	"F";	Angio / Contrast enh. =	"no";
Stack Offc. AP (P=+mm) =	-20.4408798;	Quantitative flow =	"no";
RL (L=+mm) =	3.60722065;	CENTRA =	"no";
FH (H=+mm) =	4.80962276;	Manual start =	"no";
Ang. AP (deg) =	0;	Dynamic study =	"no";
RL (deg) =	-0;	Arterial Spin labeling =	"no";
FH (deg) =	-0;	Preparation phases =	"auto";
Free rotatable =	"no";	Interactive F0 =	"no";
Multi-chunk =	"no";	B0 field map =	"no";
Large table movement =	"no";	MIP/MPR =	"no";
PlanAlign =	"no";	SWIp =	"no";
REST slabs =	0;	Images =	"M", (3) "no";
Interactive positioning =	"no";	Autoview image =	"M";
Patient position =	"head first";	Calculated images =	(4) "no";
orientation =	"supine";	Reference tissue =	"White matter";
Scan type =	"Imaging";	Recon compression =	"No";
Scan mode =	"3D";	Preset window contrast =	"soft";
technique =	"FFE";	Reconstruction mode =	"immediate";
Contrast enhancement =	"T1";	Save raw data =	"no";
Acquisition mode =	"cartesian";	Hardcopy protocol =	"no";
Fast Imaging mode =	"TFE";	Image filter =	"system default";
shot mode =	"multishot";	Geometry correction =	"default";
TFE factor =	240;	Elliptical k-space shutter =	"default";
startup echoes =	"default";	IF_info_seperator =	1634755923;
shot interval =	"user defined";	Total scan duration =	"09:06.7";
(ms) =	2500;	Rel. SNR =	1;
profile order =	"linear";	Act. TR/TE (ms) =	"6.8 / 3.2";
turbo direction =	"Y";	ACQ matrix M x P =	"256 x 240";
Echoes =	1;	ACQ voxel MPS (mm) =	"1.00 / 1.00 / 1.20";
partial echo =	"no";	REC voxel MPS (mm) =	"1.00 / 1.00 / 1.20";
shifted echo =	"no";	Scan percentage (%) =	100;
TE =	"shortest";	TFE shots =	218;
Flip angle (deg) =	9;	TFE dur. shot / acq (ms) =	"1725.2 / 1633.8";
TR =	"shortest";	Min. TI delay =	850.217285;
Halfscan =	"no";	Act. WFS (pix) / BW (Hz) =	"1.802 / 241.1";
Water-fat shift =	"user defined";	Min. WFS (pix) / Max. BW (Hz) =	"0.561 / 775.0";
(pixels) =	1.79999995;	SAR / local torso =	"< 10 %";
RF Shims =	"fixed";	Whole body / level =	"< 0.3 W/kg / normal";
Shim =	"auto";	SED =	"< 0.2 kJ/kg";
		B1+rms / Coil Power =	"0.73 uT / 10 %";

Max B1+rms =	"0.73 uT";
PNS / level =	"59 % / normal";
dB/dt =	"56.4 T/s";
Sound Pressure Level (dB) =	13.5690823;

## UCSF/Quest T2\*

SmartSelect =	"yes";	Halfscan =	"no";
Coil 1 (exclude) =	"None";	Water-fat shift =	"maximum";
Uniformity =	"CLEAR";	RF Shims =	"fixed";
FOV AP (mm) =	256;	Shim =	"default";
RL (mm) =	224;	mDIXON =	"no";
FH (mm) =	176;	Fat suppression =	"SPIR";
Voxel size AP (mm) =	1;	strength =	"strong";
RL (mm) =	1;	frequency offset =	"default";
Slice thickness (mm) =	4;	Water suppression =	"no";
Recon voxel size (mm) =	1;	BB pulse =	"no";
Fold-over suppression =	"no";	MTC =	"no";
Reconstruction matrix =	256;	Zoom imaging =	"no";
SENSE =	"no";	Diffusion mode =	"no";
k-t BLAST =	"no";	SAR mode =	"high";
Stacks =	1;	B1 mode =	"user defined";
type =	"parallel";	amplitude (uT) =	12;
slices =	44;	PNS mode =	"moderate";
slice gap =	"user defined";	Gradient mode =	"default";
gap (mm) =	0;	SoftTone mode =	"no";
slice orientation =	"transverse";	Cardiac synchronization =	"no";
fold-over direction =	"RL";	Respiratory compensation =	"no";
fat shift direction =	"P";	Navigator respiratory comp =	"no";
Stack Offc. AP (P=+mm) =	-20.4408798;	Flow compensation =	"no";
RL (L=+mm) =	3.60722065;	Temporal slice spacing =	"default";
FH (H=+mm) =	32.4649353;	Motion smoothing =	"no";
Ang. AP (deg) =	0;	NSA =	1;
RL (deg) =	-0;	Manual start =	"no";
FH (deg) =	-0;	Dynamic study =	"no";
Free rotatable =	"no";	Arterial Spin labeling =	"no";
Minimum number of packages =	3;	Preparation phases =	"auto";
Slice scan order =	"default";	Interactive F0 =	"no";
Large table movement =	"no";	B0 field map =	"no";
PlanAlign =	"no";	MIP/MPR =	"no";
REST slabs =	0;	Images =	"M", (3) "no";
Interactive positioning =	"no";	Autoview image =	"M";
Patient position =	"head first";	Calculated images =	(4) "no";
orientation =	"supine";	Reference tissue =	"Grey matter";
Scan type =	"Imaging";	Recon compression =	"No";
Scan mode =	"MS";	Preset window contrast =	"soft";
technique =	"SE";	Reconstruction mode =	"real time";
Modified SE =	"no";	Save raw data =	"no";
Acquisition mode =	"cartesian";	Hardcopy protocol =	"no";
Fast Imaging mode =	"TSE";	Image filter =	"medium";
shot mode =	"multishot";	Geometry correction =	"default";
TSE factor =	16;	IF_info_seperator =	1634755923;
startup echoes =	0;	Total scan duration =	"02:15.0";
profile order =	"linear";	Rel. SNR =	1;
DRIVE =	"no";	Act. TR (ms) =	"3000";
ultrashort =	"no";	Act. TE (ms) =	"80";
fid reduction =	"default";	ACQ matrix M x P =	"256 x 224";
Echoes =	1;	ACQ voxel MPS (mm) =	"1.00 / 1.00 / 4.00";
partial echo =	"no";	REC voxel MPS (mm) =	"1.00 / 1.00 / 4.00";
TE =	"user defined";	Scan percentage (%) =	100;
(ms) =	80;	Packages =	3;
Flip angle (deg) =	90;	Min. slice gap (mm) =	4;
Refocusing control =	"yes";	Optimal slices =	30;
angle (deg) =	120;	Max. slices =	45;
TR =	"user defined";	WFS (pix) / BW (Hz) =	"2.553 / 170.1";
(ms) =	3000;	TSE es / shot (ms) =	"9.4 / 151";
		Min. TR (ms) =	"2578";
		SAR / local torso =	"< 85 %";
		Whole body / level =	"< 2.7 W/kg / 1st level";

SED = "< 0.4 kJ/kg";  
B1+rms / Coil Power = "2.10 uT / 81 %";  
Max B1+rms = "2.10 uT";  
PNS / level = "47 % / normal";  
dB/dt = "38.8 T/s";  
Sound Pressure Level (dB) = 14.8630791;

# UCSF/Quest T2 FLAIR

SmartSelect =	"yes";	(ms) =	90;
Coil 1 (exclude) =	"None";	Refocusing control =	"yes";
Uniformity =	"CLEAR";	angle (deg) =	120;
FOV AP (mm) =	256;	TR =	"user defined";
RL (mm) =	224;	(ms) =	9000;
FH (mm) =	176;	Halfscan =	"no";
Voxel size AP (mm) =	1;	Water-fat shift =	"user defined";
RL (mm) =	1;	(pixels) =	2;
Slice thickness (mm) =	4;	IR delay (ms) =	2500;
Recon voxel size (mm) =	1;	acquire during delay =	"yes";
Fold-over suppression =	"no";	dual =	"no";
Reconstruction matrix =	256;	power =	"1";
SENSE =	"yes";	RF Shims =	"fixed";
P reduction (RL) =	2;	Shim =	"default";
k-t BLAST =	"no";	mDIXON =	"no";
Stacks =	1;	Fat suppression =	"no";
type =	"parallel";	Water suppression =	"no";
slices =	44;	MTC =	"no";
slice gap =	"user defined";	Zoom imaging =	"no";
gap (mm) =	0;	Diffusion mode =	"no";
slice orientation =	"transverse";	SAR mode =	"high";
fold-over direction =	"RL";	B1 mode =	"default";
fat shift direction =	"P";	PNS mode =	"high";
Stack Offc. AP (P=+mm) =	-20.4408798;	Gradient mode =	"default";
RL (L=+mm) =	3.60722065;	SofTone mode =	"no";
FH (H=+mm) =	32.4649353;	Cardiac synchronization =	"no";
Ang. AP (deg) =	0;	Respiratory compensation =	"no";
RL (deg) =	-0;	Navigator respiratory comp =	"no";
FH (deg) =	-0;	Flow compensation =	"no";
Free rotatable =	"no";	Motion smoothing =	"no";
Minimum number of packages =	3;	NSA =	1;
Slice scan order =	"default";	Manual start =	"no";
Large table movement =	"no";	Dynamic study =	"no";
PlanAlign =	"no";	Arterial Spin labeling =	"no";
REST slabs =	1;	Preparation phases =	"auto";
type =	"parallel";	Interactive F0 =	"no";
thickness (mm) =	60;	B0 field map =	"no";
position =	"feet";	MIP/MPR =	"no";
gap =	"default";	Images =	"M", (3) "no";
power =	"1";	Autoview image =	"M";
Interactive positioning =	"no";	Reference tissue =	"Grey matter";
Patient position =	"head first";	Recon compression =	"No";
orientation =	"supine";	Preset window contrast =	"soft";
Scan type =	"Imaging";	Reconstruction mode =	"real time";
Scan mode =	"MS";	Save raw data =	"no";
technique =	"IR";	Hardcopy protocol =	"no";
Acquisition mode =	"cartesian";	Image filter =	"system default";
Fast Imaging mode =	"TSE";	Geometry correction =	"default";
shot mode =	"multishot";	IF_info_seperator =	1634755923;
TSE factor =	16;	Total scan duration =	"03:36.0";
startup echoes =	0;	Rel. SNR =	1;
profile order =	"linear";	Act. TR/TI (ms) =	"9000 / 2500";
DRIVE =	"no";	Act. TE (ms) =	"90";
ultrashort =	"yes";	ACQ matrix M x P =	"256 x 224";
fid reduction =	"default";	ACQ voxel MPS (mm) =	"1.00 / 1.00 / 4.00";
Echoes =	1;	REC voxel MPS (mm) =	"1.00 / 1.00 / 4.00";
partial echo =	"no";	Scan percentage (%) =	100;
TE =	"user defined";	Packages =	3;
		Min. slice gap (mm) =	4;
		Optimal slices =	30;
		Max. slices =	45;
		WFS (pix) / BW (Hz) =	"1.993 / 218.0";

TSE es / shot (ms) =	"10.6 / 169";
Min. TR/TI (ms) =	"7075 / 50";
SAR / local torso =	"< 54 %";
Whole body / level =	"< 1.7 W/kg / normal";
SED =	"< 0.4 kJ/kg";
B1+rms / Coil Power =	"1.68 uT / 52 %";
Max B1+rms =	"1.70 uT";
PNS / level =	"49 % / normal";
dB/dt =	"47.1 T/s";
Sound Pressure Level (dB) =	11.7457676;

## UCSF/Quest T2 TSE

SmartSelect =	"yes";	Halfscan =	"no";
Coil 1 (exclude) =	"None";	Water-fat shift =	"maximum";
Uniformity =	"CLEAR";	RF Shims =	"fixed";
FOV AP (mm) =	256;	Shim =	"default";
RL (mm) =	224;	mDIXON =	"no";
FH (mm) =	176;	Fat suppression =	"SPIR";
Voxel size AP (mm) =	1;	strength =	"strong";
RL (mm) =	1;	frequency offset =	"default";
Slice thickness (mm) =	4;	Water suppression =	"no";
Recon voxel size (mm) =	1;	BB pulse =	"no";
Fold-over suppression =	"no";	MTC =	"no";
Reconstruction matrix =	256;	Zoom imaging =	"no";
SENSE =	"no";	Diffusion mode =	"no";
k-t BLAST =	"no";	SAR mode =	"high";
Stacks =	1;	B1 mode =	"user defined";
type =	"parallel";	amplitude (uT) =	12;
slices =	44;	PNS mode =	"moderate";
slice gap =	"user defined";	Gradient mode =	"default";
gap (mm) =	0;	SofTone mode =	"no";
slice orientation =	"transverse";	Cardiac synchronization =	"no";
fold-over direction =	"RL";	Respiratory compensation =	"no";
fat shift direction =	"P";	Navigator respiratory comp =	"no";
Stack Offc. AP (P=+mm) =	-20.4408798;	Flow compensation =	"no";
RL (L=+mm) =	3.60722065;	Temporal slice spacing =	"default";
FH (H=+mm) =	32.4649353;	Motion smoothing =	"no";
Ang. AP (deg) =	0;	NSA =	1;
RL (deg) =	-0;	Manual start =	"no";
FH (deg) =	-0;	Dynamic study =	"no";
Free rotatable =	"no";	Arterial Spin labeling =	"no";
Minimum number of packages =	3;	Preparation phases =	"auto";
Slice scan order =	"default";	Interactive F0 =	"no";
Large table movement =	"no";	B0 field map =	"no";
PlanAlign =	"no";	MIP/MPR =	"no";
REST slabs =	0;	Images =	"M", (3) "no";
Interactive positioning =	"no";	Autoview image =	"M";
Patient position =	"head first";	Calculated images =	(4) "no";
orientation =	"supine";	Reference tissue =	"Grey matter";
Scan type =	"Imaging";	Recon compression =	"No";
Scan mode =	"MS";	Preset window contrast =	"soft";
technique =	"SE";	Reconstruction mode =	"real time";
Modified SE =	"no";	Save raw data =	"no";
Acquisition mode =	"cartesian";	Hardcopy protocol =	"no";
Fast Imaging mode =	"TSE";	Image filter =	"medium";
shot mode =	"multishot";	Geometry correction =	"default";
TSE factor =	16;	IF_info_seperator =	1634755923;
startup echoes =	0;	Total scan duration =	"02:15.0";
profile order =	"linear";	Rel. SNR =	1;
DRIVE =	"no";	Act. TR (ms) =	"3000";
ultrashort =	"no";	Act. TE (ms) =	"80";
fid reduction =	"default";	ACQ matrix M x P =	"256 x 224";
Echoes =	1;	ACQ voxel MPS (mm) =	"1.00 / 1.00 / 4.00";
partial echo =	"no";	REC voxel MPS (mm) =	"1.00 / 1.00 / 4.00";
TE =	"user defined";	Scan percentage (%) =	100;
(ms) =	80;	Packages =	3;
Flip angle (deg) =	90;	Min. slice gap (mm) =	4;
Refocusing control =	"yes";	Optimal slices =	30;
angle (deg) =	120;	Max. slices =	45;
TR =	"user defined";	WFS (pix) / BW (Hz) =	"2.553 / 170.1";
(ms) =	3000;	TSE es / shot (ms) =	"9.4 / 151";
		Min. TR (ms) =	"2578";
		SAR / local torso =	"< 85 %";
		Whole body / level =	"< 2.7 W/kg / 1st level";

SED = "< 0.4 kJ/kg";  
B1+rms / Coil Power = "2.10 uT / 81 %";  
Max B1+rms = "2.10 uT";  
PNS / level = "47 % / normal";  
dB/dt = "38.8 T/s";  
Sound Pressure Level (dB) = 14.8630791;

## UCSF/Quest Axial DWI

SmartSelect =	"yes";	frequency offset =	"user defined";
Coil 1 (exclude) =	"None";	offset (Hz) =	220;
Uniformity =	"CLEAR";	Grad Rev Fat suppression =	"yes";
FOV RL (mm) =	256;	Water suppression =	"no";
AP (mm) =	256;	BB pulse =	"no";
FH (mm) =	152.800003;	MTC =	"no";
Voxel size RL (mm) =	1.33000004;	Diffusion mode =	"DWI";
AP (mm) =	1.33333337;	gradient overplus =	"no";
Slice thickness (mm) =	4;	direction =	"M", "P", "S";
Recon voxel size (mm) =	1.33333302;	nr of b-factors =	2;
Fold-over suppression =	"no";	b-factor order =	"ascending";
Reconstruction matrix =	192;	max b-factor =	1000;
SENSE =	"yes";	average high b =	"no";
P reduction (AP) =	2;	SAR mode =	"high";
k-t BLAST =	"no";	B1 mode =	"default";
Stacks =	1;	PNS mode =	"high";
type =	"parallel";	Gradient mode =	"maximum";
slices =	32;	SofTone mode =	"no";
slice gap =	"user defined";	Cardiac synchronization =	"no";
gap (mm) =	0.800000191;	Respiratory compensation =	"no";
slice orientation =	"transverse";	Navigator respiratory comp =	"no";
fold-over direction =	"AP";	Flow compensation =	"no";
fat shift direction =	"P";	Temporal slice spacing =	"default";
Stack Offc. AP (P=+mm) =	4.63397026;	NSA =	3;
RL (L=+mm) =	-18.1911373;	SMART =	"no";
FH (H=+mm) =	30.1373558;	Manual start =	"no";
Ang. AP (deg) =	0;	Dynamic study =	"no";
RL (deg) =	-0;	Arterial Spin labeling =	"no";
FH (deg) =	-0;	Preparation phases =	"auto";
Free rotatable =	"no";	Interactive F0 =	"no";
Minimum number of packages =	1;	B0 field map =	"no";
Slice scan order =	"default";	MIP/MPR =	"no";
Large table movement =	"no";	Images =	"M", (3) "no";
PlanAlign =	"no";	Autoview image =	"M";
REST slabs =	0;	Calculated images =	(4) "no";
Interactive positioning =	"no";	Reference tissue =	"Grey matter";
Patient position =	"head first";	Recon compression =	"No";
orientation =	"supine";	Preset window contrast =	"soft";
Scan type =	"Imaging";	Reconstruction mode =	"real time";
Scan mode =	"MS";	Save raw data =	"no";
technique =	"SE";	Hardcopy protocol =	"no";
Modified SE =	"no";	Image filter =	"system default";
Acquisition mode =	"cartesian";	Geometry correction =	"default";
Fast Imaging mode =	"EPI";	IF_info_seperator =	1634755923;
shot mode =	"single-shot";	Total scan duration =	"01:24.0";
Echoes =	1;	Rel. SNR =	1;
partial echo =	"no";	Act. TR (ms) =	"6000";
TE =	"shortest";	Act. TE (ms) =	"110";
Flip angle (deg) =	90;	ACQ matrix M x P =	"192 x 190";
TR =	"user defined";	ACQ voxel MPS (mm) =	"1.33 / 1.35 / 4.00";
(ms) =	6000;	REC voxel MPS (mm) =	"1.33 / 1.33 / 4.00";
Halfscan =	"yes";	Scan percentage (%) =	98.9583359;
factor =	0.74683547;	Packages =	1;
Water-fat shift =	"minimum";	Min. slice gap (mm) =	-0;
RF Shims =	"fixed";	EPI factor =	95;
Shim =	"auto";	WFS (pix) / BW (Hz) =	"41.446 / 10.5";
mDIXON =	"no";	BW in EPI freq. dir. (Hz) =	"1141.8";
Fat suppression =	"SPIR";	Min. TR (ms) =	"5494";
strength =	"strong";	SPIR offset act./default (Hz) =	"220 [220]";
		SAR / local torso =	"< 21 %";
		Whole body / level =	"< 0.7 W/kg / normal";
		SED =	"< 0.1 kJ/kg";

B1+rms / Coil Power = "1.06 uT / 20 %";  
Max B1+rms = "1.06 uT";  
PNS / level = "82 % / 1st level";  
dB/dt = "124.8 T/s";  
Sound Pressure Level (dB) = 20.3896351;

## UCSF/Quest Coronal DWI

SmartSelect =	"yes";	frequency offset =	"user defined";
Coil 1 (exclude) =	"None";	offset (Hz) =	220;
Uniformity =	"CLEAR";	Grad Rev Fat suppression =	"yes";
FOV FH (mm) =	256;	Water suppression =	"no";
RL (mm) =	256;	BB pulse =	"no";
AP (mm) =	172;	MTC =	"no";
Voxel size FH (mm) =	1.33000004;	Diffusion mode =	"DWI";
RL (mm) =	1.33333337;	gradient overplus =	"no";
Slice thickness (mm) =	4;	direction =	"M", "P", "S";
Recon voxel size (mm) =	1.14285719;	nr of b-factors =	2;
Fold-over suppression =	"no";	b-factor order =	"ascending";
Reconstruction matrix =	224;	max b-factor =	1000;
SENSE =	"yes";	average high b =	"no";
P reduction (RL) =	2;	SAR mode =	"high";
k-t BLAST =	"no";	B1 mode =	"default";
Stacks =	1;	PNS mode =	"high";
type =	"parallel";	Gradient mode =	"maximum";
slices =	36;	SofTone mode =	"no";
slice gap =	"user defined";	Cardiac synchronization =	"no";
gap (mm) =	0.800000191;	Respiratory compensation =	"no";
slice orientation =	"coronal";	Navigator respiratory comp =	"no";
fold-over direction =	"RL";	Flow compensation =	"no";
fat shift direction =	"L";	Temporal slice spacing =	"default";
Stack Offc. AP (P=+mm) =	4.63397026;	NSA =	3;
RL (L=+mm) =	-18.1911373;	SMART =	"no";
FH (H=+mm) =	30.1373558;	Manual start =	"no";
Ang. AP (deg) =	0;	Dynamic study =	"no";
RL (deg) =	-0;	Arterial Spin labeling =	"no";
FH (deg) =	-0;	Preparation phases =	"auto";
Free rotatable =	"no";	Interactive F0 =	"no";
Minimum number of packages =	1;	B0 field map =	"no";
Slice scan order =	"default";	MIP/MPR =	"no";
Large table movement =	"no";	Images =	"M", (3) "no";
PlanAlign =	"no";	Autoview image =	"M";
REST slabs =	0;	Calculated images =	(4) "no";
Interactive positioning =	"no";	Reference tissue =	"Grey matter";
Patient position =	"head first";	Recon compression =	"No";
orientation =	"supine";	Preset window contrast =	"soft";
Scan type =	"Imaging";	Reconstruction mode =	"real time";
Scan mode =	"MS";	Save raw data =	"no";
technique =	"SE";	Hardcopy protocol =	"no";
Modified SE =	"no";	Image filter =	"system default";
Acquisition mode =	"cartesian";	Geometry correction =	"default";
Fast Imaging mode =	"EPI";	IF_info_seperator =	1634755923;
shot mode =	"single-shot";	Total scan duration =	"01:45.0";
Echoes =	1;	Rel. SNR =	1;
partial echo =	"no";	Act. TR (ms) =	"7500";
TE =	"shortest";	Act. TE (ms) =	"106";
Flip angle (deg) =	90;	ACQ matrix M x P =	"192 x 190";
TR =	"user defined";	ACQ voxel MPS (mm) =	"1.33 / 1.35 / 4.00";
(ms) =	7500;	REC voxel MPS (mm) =	"1.14 / 1.14 / 4.00";
Halfscan =	"yes";	Scan percentage (%) =	98.9583359;
factor =	0.748427689;	Packages =	1;
Water-fat shift =	"minimum";	Min. slice gap (mm) =	-0;
RF Shims =	"fixed";	EPI factor =	95;
Shim =	"auto";	WFS (pix) / BW (Hz) =	"37.751 / 11.5";
mDIXON =	"no";	BW in EPI freq. dir. (Hz) =	"1270.4";
Fat suppression =	"SPIR";	Min. TR (ms) =	"5900";
strength =	"strong";	SPIR offset act./default (Hz) =	"220 [220]";
		SAR / local torso =	"< 19 %";
		Whole body / level =	"< 0.6 W/kg / normal";
		SED =	"< 0.1 kJ/kg";

B1+rms / Coil Power = "1.00 uT / 18 %";  
Max B1+rms = "1.00 uT";  
PNS / level = "82 % / 1st level";  
dB/dt = "124.8 T/s";  
Sound Pressure Level (dB) = 24.0876598;

# SIEMENS MAGNETOM Avanto syngo MR B17

\\USER\VIRC\_RESEARCH\Quest-v1\Quest\localizer

TA: 9.2 s    PAT: Off    Voxel size: 1.6x0.8x10.0 mm    Rel. SNR: 1.00    SIEMENS: gre

## Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	On
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

Phase resolution	50 %
Phase partial Fourier	Off
Interpolation	On
-----	
PAT mode	None
Matrix Coil Mode	Auto (CP)
-----	
Image Filter	Off
Distortion Corr.	On
Mode	2D
Unfiltered images	Off
Prescan Normalize	Off
Normalize	Off
B1 filter	Off
Raw filter	Off
Elliptical filter	On
Mode	Inplane

## Routine

Slice group 1	
Slices	1
Dist. factor	20 %
Position	Isocenter
Orientation	Sagittal
Phase enc. dir.	A >> P
Rotation	0.00 deg
Slice group 2	
Slices	1
Dist. factor	20 %
Position	L0.0 A27.1 H7.7
Orientation	Transversal
Phase enc. dir.	A >> P
Rotation	0.00 deg
Slice group 3	
Slices	1
Dist. factor	20 %
Position	L0.0 A50.4 H5.3
Orientation	Coronal
Phase enc. dir.	R >> L
Rotation	0.00 deg
Phase oversampling	0 %
FoV read	200 mm
FoV phase	100.0 %
Slice thickness	10.0 mm
TR	20.0 ms
TE	5.00 ms
Averages	1
Concatenations	3
Filter	Distortion Corr.(2D), Elliptical filter
Coil elements	D11-18

## Geometry

Multi-slice mode	Sequential
Series	Interleaved
-----	
Saturation mode	Standard
Special sat.	None
-----	
Tim CT mode	Off

## System

Body	Off
D11	On
D12	On
D13	On
D14	On
D15	On
D16	On
D17	On
D18	On
-----	
Positioning mode	REF
Table position	H
Table position	0 mm
MSMA	S - C - T
Sagittal	R >> L
Coronal	P >> A
Transversal	H >> F
Save uncombined	Off
Coil Combine Mode	Adaptive Combine
Auto Coil Select	Default
-----	
Shim mode	Tune up
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
R >> L	350 mm
A >> P	263 mm
F >> H	350 mm

## Contrast

TD	0 ms
MTC	Off
Magn. preparation	None
Flip angle	40 deg
Fat suppr.	None
Water suppr.	None
-----	
Averaging mode	Short term
Reconstruction	Magnitude
Measurements	1
Multiple series	Each measurement

## Physio

1st Signal/Mode	None
Segments	1
-----	
Tagging	None

## Resolution

Base resolution	256
-----------------	-----

# SIEMENS MAGNETOM Avanto syngo MR B17

Dark blood	Off
-----	
Resp. control	Off

## Inline

Subtract	Off
Liver registration	Off
Std-Dev-Sag	Off
Std-Dev-Cor	Off
Std-Dev-Tra	Off
Std-Dev-Time	Off
MIP-Sag	Off
MIP-Cor	Off
MIP-Tra	Off
MIP-Time	Off
Save original images	On
-----	
Wash - In	Off
Wash - Out	Off
TTP	Off
PEI	Off
MIP - time	Off

## Sequence

Introduction	On
Dimension	2D
Phase stabilisation	Off
Asymmetric echo	Off
Contrasts	1
Bandwidth	180 Hz/Px
Flow comp.	No
-----	
RF pulse type	Fast
Gradient mode	Normal
Excitation	Slice-sel.
RF spoiling	On

# SIEMENS MAGNETOM Avanto syngo MR B17

\\USER\VIRC\_RESEARCH\Quest-v1\Quest\Sag MPRAGE

TA: 7:42    PAT: Off    Voxel size: 1.3x1.3x1.2 mm    Rel. SNR: 1.00    SIEMENS: tfl

### Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	Off
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

### Routine

Slab group 1	
Slabs	1
Dist. factor	50 %
Position	L0.8 A22.5 H9.3
Orientation	Sagittal
Phase enc. dir.	A >> P
Rotation	0.00 deg
Phase oversampling	0 %
Slice oversampling	20.0 %
Slices per slab	160
FoV read	240 mm
FoV phase	100.0 %
Slice thickness	1.20 mm
TR	2400 ms
TE	3.5 ms
Averages	1
Concatenations	1
Filter	None
Coil elements	HE1-4

### Contrast

Magn. preparation	Non-sel. IR
T1	1000 ms
Flip angle	8 deg
Fat suppr.	None
Water suppr.	None
Averaging mode	Long term
Reconstruction	Magnitude
Measurements	1
Multiple series	Off

### Resolution

Base resolution	192
Phase resolution	100 %
Slice resolution	100 %
Phase partial Fourier	Off
Slice partial Fourier	Off
Interpolation	Off
PAT mode	None
Matrix Coil Mode	Auto (CP)
Image Filter	Off
Distortion Corr.	Off
Prescan Normalize	Off
Normalize	Off
B1 filter	Off
Raw filter	Off

Elliptical filter    Off

### Geometry

Multi-slice mode	Single shot
Series	Interleaved

### System

Body	Off
HE2	On
HE4	On
HE1	On
HE3	On
SP4	Off
SP2	Off
SP8	Off
SP6	Off
SP3	Off
SP1	Off
SP7	Off
SP5	Off

Positioning mode	REF
Table position	H
Table position	0 mm
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Save uncombined	Off
Coil Combine Mode	Sum of Squares
Auto Coil Select	Default

Shim mode	Standard
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	L0.8 A22.5 H9.3
Orientation	Sagittal
Rotation	0.00 deg
F >> H	240 mm
A >> P	240 mm
R >> L	192 mm

### Physio

1st Signal/Mode	None
Dark blood	Off
Resp. control	Off

### Inline

Subtract	Off
Std-Dev-Sag	Off
Std-Dev-Cor	Off
Std-Dev-Tra	Off
Std-Dev-Time	Off
MIP-Sag	Off
MIP-Cor	Off
MIP-Tra	Off
MIP-Time	Off
Save original images	On

### Sequence

Introduction	On
Dimension	3D

# SIEMENS MAGNETOM Avanto syngo MR B17

Elliptical scanning	Off
Asymmetric echo	Off
Bandwidth	180 Hz/Px
Flow comp.	No
Echo spacing	7.9 ms

---

RF pulse type	Fast
Gradient mode	Fast*
Excitation	Non-sel.
RF spoiling	On

# SIEMENS MAGNETOM Avanto syngo MR B17

\\USER\VIRC\_RESEARCH\Quest-v1\Quest\Ax T2star

TA: 5:29    PAT: Off    Voxel size: 1.3x1.3x4.0 mm    Rel. SNR: 1.00    SIEMENS: gre

## Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	On
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

## Routine

Slice group 1	
Slices	44
Dist. factor	0 %
Position	Isocenter
Orientation	Transversal
Phase enc. dir.	R >> L
Rotation	90.00 deg
Phase oversampling	0 %
FoV read	256 mm
FoV phase	87.5 %
Slice thickness	4.0 mm
TR	650 ms
TE	30.0 ms
Averages	1
Concatenations	3
Filter	Prescan Normalize, Elliptical filter
Coil elements	HE

## Contrast

TD	0 ms
MTC	Off
Magn. preparation	None
Flip angle	20 deg
Fat suppr.	None
Water suppr.	None
Averaging mode	Short term
Reconstruction	Magnitude
Measurements	1
Multiple series	Each measurement

## Resolution

Base resolution	192
Phase resolution	100 %
Phase partial Fourier	Off
Interpolation	Off
PAT mode	None
Matrix Coil Mode	Auto (CP)
Image Filter	Off
Distortion Corr.	Off
Unfiltered images	Off
Prescan Normalize	On
Normalize	Off
B1 filter	Off
Raw filter	Off
Elliptical filter	On

## Mode

### Geometry

Multi-slice mode	Interleaved
Series	Interleaved
Saturation mode	Standard
Special sat.	None
Tim CT mode	Off

### System

Body	Off
HE	On
DLL	Off
Positioning mode	REF
Table position	H
Table position	0 mm
MSMA	T - C - S
Sagittal	R >> L
Coronal	P >> A
Transversal	F >> H
Save uncombined	Off
Coil Combine Mode	Adaptive Combine
Auto Coil Select	Default
Shim mode	Tune up
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
R >> L	350 mm
A >> P	263 mm
F >> H	350 mm

### Physio

1st Signal/Mode	None
Segments	1
Tagging	None
Dark blood	Off
Resp. control	Off

### Inline

Subtract	Off
Liver registration	Off
Std-Dev-Sag	Off
Std-Dev-Cor	Off
Std-Dev-Tra	Off
Std-Dev-Time	Off
MIP-Sag	Off
MIP-Cor	Off
MIP-Tra	Off
MIP-Time	Off
Save original images	On
Wash - In	Off
Wash - Out	Off
TTP	Off
PEI	Off
MIP - time	Off

# SIEMENS MAGNETOM Avanto syngo MR B17

## Sequence

Introduction	On
Dimension	2D
Phase stabilisation	Off
Asymmetric echo	Off
Contrasts	1
Bandwidth	50 Hz/Px
Flow comp.	Slice/Read
-----	
RF pulse type	Normal
Gradient mode	Fast
Excitation	Slice-sel.
RF spoiling	On

# SIEMENS MAGNETOM Avanto syngo MR B17

\\USER\VIRC\_RESEARCH\Quest-v1\Quest\Ax FLAIR

TA: 4:30    PAT: Off    Voxel size: 1.0x1.0x4.0 mm    Rel. SNR: 1.00    SIEMENS: tse

## Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	On
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

## Routine

Slice group 1	
Slices	44
Dist. factor	0 %
Position	Isocenter
Orientation	Transversal
Phase enc. dir.	A >> P
Rotation	0.00 deg
Phase oversampling	0 %
FoV read	256 mm
FoV phase	87.5 %
Slice thickness	4.0 mm
TR	9000 ms
TE	91 ms
Averages	1
Concatenations	2
Filter	Prescan Normalize, Elliptical filter
Coil elements	HE

## Contrast

TD	0.0 ms
MTC	Off
Magn. preparation	Slice-sel. IR
TI	2250 ms
Freeze suppressed tissue	Off
Flip angle	180 deg
Fat suppr.	None
Water suppr.	None
Restore magn.	Off
-----	
Averaging mode	Short term
Reconstruction	Magnitude
Measurements	1
Multiple series	Each measurement

## Resolution

Base resolution	256
Phase resolution	100 %
Phase partial Fourier	Off
Trajectory	Cartesian
Interpolation	Off
-----	
PAT mode	None
Matrix Coil Mode	Auto (CP)
-----	
Image Filter	Off
Distortion Corr.	Off
Unfiltered images	Off
Prescan Normalize	On

Normalize	Off
B1 filter	Off
Raw filter	Off
Elliptical filter	On
Mode	Inplane

## Geometry

Multi-slice mode	Interleaved
Series	Interleaved
-----	
Special sat.	Parallel F
Gap	10 mm
Thickness	50 mm
-----	
Tim CT mode	Off

## System

Body	Off
HE	On
DLL	Off
-----	
Positioning mode	FIX
Table position	H
Table position	0 mm
MSMA	T - C - S
Sagittal	R >> L
Coronal	P >> A
Transversal	F >> H
Save uncombined	Off
Coil Combine Mode	Adaptive Combine
Auto Coil Select	Default
-----	
Shim mode	Standard
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
R >> L	256 mm
A >> P	224 mm
F >> H	176 mm

## Physio

1st Signal/Mode	None
-----	
Dark blood	Off
-----	
Resp. control	Off

## Inline

Subtract	Off
Std-Dev-Sag	Off
Std-Dev-Cor	Off
Std-Dev-Tra	Off
Std-Dev-Time	Off
MIP-Sag	Off
MIP-Cor	Off
MIP-Tra	Off
MIP-Time	Off
Save original images	On

## Sequence

Introduction	Off
Dimension	2D

# SIEMENS MAGNETOM Avanto syngo MR B17

Compensate T2 decay	Off
Reduce Motion Sens.	Off
Contrasts	1
Bandwidth	120 Hz/Px
Flow comp.	No
Allowed delay	30 s
Echo spacing	13 ms
-----	
Define	Turbo factor
Turbo factor	16
Echo trains per slice	14
RF pulse type	Normal
Gradient mode	Normal

# SIEMENS MAGNETOM Avanto syngo MR B17

\\USER\WIRC\_RESEARCH\Quest-v1\Quest\Ax T2 TSE

TA: 2:26    PAT: Off    Voxel size: 1.0x1.0x4.0 mm    Rel. SNR: 1.00    SIEMENS: tse

### Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	Off
Inline movie	Off
Auto store images	On
Load to stamp segments	On
Load images to graphic segments	On
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

### Routine

Slice group 1	
Slices	44
Dist. factor	0 %
Position	Isocenter
Orientation	Transversal
Phase enc. dir.	R >> L
Rotation	90.00 deg
Phase oversampling	0 %
FoV read	256 mm
FoV phase	87.5 %
Slice thickness	4.0 mm
TR	3000 ms
TE	92 ms
Averages	1
Concatenations	3
Filter	Distortion Corr.(2D), Elliptical filter
Coil elements	HE

### Contrast

TD	0.0 ms
MTC	Off
Magn. preparation	None
Flip angle	178 deg
Fat suppr.	Fat sat.
Fat sat. mode	Strong
Water suppr.	None
Restore magn.	Off
Averaging mode	Short term
Reconstruction	Magnitude
Measurements	1
Multiple series	Each measurement

### Resolution

Base resolution	256
Phase resolution	100 %
Phase partial Fourier	Off
Trajectory	Cartesian
Interpolation	On
PAT mode	None
Matrix Coil Mode	Auto (CP)
Image Filter	Off
Distortion Corr.	On
Mode	2D
Unfiltered images	Off
Prescan Normalize	Off

Normalize	Off
B1 filter	Off
Raw filter	Off
Elliptical filter	On
Mode	Inplane

### Geometry

Multi-slice mode	Interleaved
Series	Interleaved
Special sat.	None
Tim CT mode	Off

### System

Body	Off
HE	On
DLL	Off
Positioning mode	ISO
Table position	H
Table position	0 mm
MSMA	T - C - S
Sagittal	R >> L
Coronal	P >> A
Transversal	F >> H
Save uncombined	Off
Coil Combine Mode	Adaptive Combine
Auto Coil Select	Default
Shim mode	Standard
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Transversal
Rotation	90.00 deg
A >> P	256 mm
R >> L	224 mm
F >> H	176 mm

### Physio

1st Signal/Mode	None
Dark blood	Off
Resp. control	Off

### Inline

Subtract	Off
Std-Dev-Sag	Off
Std-Dev-Cor	Off
Std-Dev-Tra	Off
Std-Dev-Time	Off
MIP-Sag	Off
MIP-Cor	Off
MIP-Tra	Off
MIP-Time	Off
Save original images	On

### Sequence

Introduction	On
Dimension	2D
Compensate T2 decay	Off
Reduce Motion Sens.	Off

# SIEMENS MAGNETOM Avanto syngo MR B17

Contrasts	1
Bandwidth	181 Hz/Px
Flow comp.	No
Allowed delay	30 s
Echo spacing	10.2 ms

---

Define	Turbo factor
Turbo factor	16
Echo trains per slice	14
RF pulse type	Normal
Gradient mode	Normal

# SIEMENS MAGNETOM Avanto syngo MR B17

\\USER\VIRC\_RESEARCH\Quest-v1\Quest\DIFFUSION AX

TA: 1:32    PAT: 2    Voxel size: 1.6x1.6x4.0 mm    Rel. SNR: 1.00    SIEMENS: ep2d\_diff

### Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	Off
Inline movie	Off
Auto store images	On
Load to stamp segments	On
Load images to graphic segments	On
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	On
Start measurements	single

### Geometry

Multi-slice mode	Interleaved
Series	Interleaved
Special sat.	None

### System

Body	Off
HE2	On
HE4	On
HE1	On
HE3	On
SP4	Off
SP2	Off
SP8	Off
SP6	Off
SP3	Off
SP1	Off
SP7	Off
SP5	Off

### Routine

Slice group 1	
Slices	32
Dist. factor	20 %
Position	R4.4 A21.5 F0.1
Orientation	Transversal
Phase enc. dir.	A >> P
Rotation	0.00 deg
Phase oversampling	0 %
FoV read	256 mm
FoV phase	100.0 %
Slice thickness	4.0 mm
TR	6000 ms
TE	90 ms
Averages	3
Concatenations	1
Filter	Raw filter, Distortion Corr.(2D), Prescan Normalize
Coil elements	HE1-4

Positioning mode	REF
Table position	H
Table position	0 mm
MSMA	T - C - S
Sagittal	R >> L
Coronal	P >> A
Transversal	F >> H
Coil Combine Mode	Adaptive Combine
Auto Coil Select	Default

Shim mode	Standard
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	R4.4 A21.5 F0.1
Orientation	Transversal
Rotation	0.00 deg
R >> L	256 mm
A >> P	256 mm
F >> H	153 mm

### Contrast

MTC	Off
Magn. preparation	None
Fat suppr.	Fat sat.
Averaging mode	Long term
Reconstruction	Magnitude
Delay in TR	0 ms

### Resolution

Base resolution	160
Phase resolution	100 %
Phase partial Fourier	6/8
Interpolation	Off
PAT mode	GRAPPA
Accel. factor PE	2
Ref. lines PE	24
Matrix Coil Mode	Auto (Triple)
Reference scan mode	Separate
Distortion Corr. Mode	On 2D
Unfiltered images	Off
Prescan Normalize	On
Raw filter	On
Intensity	Weak
Slope	25
Elliptical filter	Off
Hamming	Off

### Physio

1st Signal/Mode	None
Resp. control	Off

### Diff

Diffusion mode	3-Scan Trace
Diff. weightings	2
b-value 1	0 s/mm <sup>2</sup>
b-value 2	1000 s/mm <sup>2</sup>
Diff. weighted images	Off
Trace weighted images	On
Average ADC maps	On
Individual ADC maps	Off
Mosaic	Off
Noise level	40
Diff. directions	3

### Sequence

Introduction	On
Bandwidth	1250 Hz/Px
Free echo spacing	Off

# SIEMENS MAGNETOM Avanto syngo MR B17

Echo spacing	0.88 ms
EPI factor	160
RF pulse type	Normal
Gradient mode	Fast*

# SIEMENS MAGNETOM Avanto syngo MR B17

\\USER\VIRC\_RESEARCH\Quest-v1\Quest\DIFFUSION Cor

TA: 1:32    PAT: 2    Voxel size: 1.6x1.6x4.0 mm    Rel. SNR: 1.00    SIEMENS: ep2d\_diff

## Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	Off
Inline movie	Off
Auto store images	On
Load to stamp segments	On
Load images to graphic segments	On
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	On
Start measurements	single

## Routine

Slice group 1	
Slices	36
Dist. factor	20 %
Position	R4.4 A21.5 F0.1
Orientation	Coronal
Phase enc. dir.	R >> L
Rotation	0.00 deg
Phase oversampling	0 %
FoV read	256 mm
FoV phase	100.0 %
Slice thickness	4.0 mm
TR	6000 ms
TE	90 ms
Averages	3
Concatenations	1
Filter	Raw filter, Distortion Corr.(2D), Prescan Normalize
Coil elements	HE1-4

## Contrast

MTC	Off
Magn. preparation	None
Fat suppr.	Fat sat.
Averaging mode	Long term
Reconstruction	Magnitude
Delay in TR	0 ms

## Resolution

Base resolution	160
Phase resolution	100 %
Phase partial Fourier	6/8
Interpolation	Off
PAT mode	GRAPPA
Accel. factor PE	2
Ref. lines PE	24
Matrix Coil Mode	Auto (Triple)
Reference scan mode	Separate
Distortion Corr. Mode	On 2D
Unfiltered images	Off
Prescan Normalize	On
Raw filter	On
Intensity	Weak
Slope	25
Elliptical filter	Off
Hamming	Off

## Geometry

Multi-slice mode	Interleaved
Series	Interleaved
Special sat.	None

## System

Body	Off
HE2	On
HE4	On
HE1	On
HE3	On
SP4	Off
SP2	Off
SP8	Off
SP6	Off
SP3	Off
SP1	Off
SP7	Off
SP5	Off
Positioning mode	REF
Table position	H
Table position	0 mm
MSMA	T - C - S
Sagittal	R >> L
Coronal	P >> A
Transversal	F >> H
Coil Combine Mode	Adaptive Combine
Auto Coil Select	Default
Shim mode	Standard
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	R4.4 A21.5 F0.1
Orientation	Coronal
Rotation	0.00 deg
F >> H	256 mm
R >> L	256 mm
A >> P	172 mm

## Physio

1st Signal/Mode	None
Resp. control	Off

## Diff

Diffusion mode	3-Scan Trace
Diff. weightings	2
b-value 1	0 s/mm <sup>2</sup>
b-value 2	1000 s/mm <sup>2</sup>
Diff. weighted images	Off
Trace weighted images	On
Average ADC maps	On
Individual ADC maps	Off
Mosaic	Off
Noise level	40
Diff. directions	3

## Sequence

Introduction	On
Bandwidth	1250 Hz/Px
Free echo spacing	Off

# SIEMENS MAGNETOM Avanto syngo MR B17

Echo spacing	0.88 ms
EPI factor	160
RF pulse type	Normal
Gradient mode	Fast*

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\\USER	VIRC_RESEARCH	Quest-v1	Quest	localizer
				Angle Sag to midline
				Sag MPRAGE
				Orient Axials to AC/PC
				Ax T2star
				Ax FLAIR
				Ax T2 TSE
				DIFFUSION AX
				DIFFUSION Cor

# SIEMENS MAGNETOM TrioTim syngo MR B17

\\USER\MAC\Rankin\_lab\QUESTv2\localizer

TA: 0:10    PAT: Off    Voxel size: 1.9x1.5x8.0 mm    Rel. SNR: 1.00    SIEMENS: gre

## Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	Off
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	Off
Wait for user to start	Off
Start measurements	single

Phase partial Fourier	Off
Interpolation	Off
-----	
PAT mode	None
Matrix Coil Mode	Auto (CP)
-----	
Image Filter	Off
Distortion Corr.	Off
Unfiltered images	Off
Prescan Normalize	On
Normalize	Off
B1 filter	Off
Raw filter	On
Intensity	Weak
Slope	25
Elliptical filter	Off

## Routine

Slice group 1	
Slices	1
Dist. factor	20 %
Position	Isocenter
Orientation	Sagittal
Phase enc. dir.	A >> P
Rotation	0.00 deg
Slice group 2	
Slices	1
Dist. factor	20 %
Position	Isocenter
Orientation	Coronal
Phase enc. dir.	R >> L
Rotation	0.00 deg
Slice group 3	
Slices	1
Dist. factor	20 %
Position	Isocenter
Orientation	Transversal
Phase enc. dir.	R >> L
Rotation	90.00 deg
Phase oversampling	0 %
FoV read	280 mm
FoV phase	100.0 %
Slice thickness	8.0 mm
TR	20.0 ms
TE	5.00 ms
Averages	1
Concatenations	3
Filter	Raw filter, Prescan Normalize
Coil elements	HEA;HEP

## Geometry

Multi-slice mode	Sequential
Series	Ascending
-----	
Saturation mode	Standard
Special sat.	None
-----	
Tim CT mode	Off

## System

Body	Off
HEP	On
HEA	On
-----	
Positioning mode	REF
Table position	H
Table position	0 mm
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Save uncombined	Off
Coil Combine Mode	Adaptive Combine
AutoAlign	---
Auto Coil Select	Default
-----	
Shim mode	Tune up
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
R >> L	350 mm
A >> P	263 mm
F >> H	350 mm

## Contrast

TD	0 ms
MTC	Off
Magn. preparation	None
Flip angle	40 deg
Fat suppr.	None
Water suppr.	None
-----	
Averaging mode	Short term
Reconstruction	Magnitude
Measurements	1
Multiple series	Off

## Physio

1st Signal/Mode	None
Segments	1
-----	
Dark blood	Off
-----	
Resp. control	Off

## Resolution

Base resolution	192
Phase resolution	75 %

## Inline

Subtract	Off
Liver registration	Off
Std-Dev-Sag	Off

# SIEMENS MAGNETOM TrioTim syngo MR B17

Std-Dev-Cor	Off
Std-Dev-Tra	Off
Std-Dev-Time	Off
MIP-Sag	Off
MIP-Cor	Off
MIP-Tra	Off
MIP-Time	Off
Save original images	On
-----	
Wash - In	Off
Wash - Out	Off
TTP	Off
PEI	Off
MIP - time	Off

## Sequence

Introduction	On
Dimension	2D
Phase stabilisation	Off
Asymmetric echo	Off
Contrasts	1
Bandwidth	180 Hz/Px
Flow comp.	No
Allowed delay	0 s
-----	
RF pulse type	Normal
Gradient mode	Fast
Excitation	Slice-sel.
RF spoiling	On

# SIEMENS MAGNETOM TrioTim syngo MR B17

\\USER\MAC\Rankin\_lab\QUESTv2\MPRAGE

TA: 9:14    PAT: Off    Voxel size: 1.0x1.0x1.2 mm    Rel. SNR: 1.00    SIEMENS: tfl

### Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	Off
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

### Routine

Slab group 1	
Slabs	1
Dist. factor	50 %
Position	Isocenter
Orientation	Sagittal
Phase enc. dir.	A >> P
Rotation	0.00 deg
Phase oversampling	0 %
Slice oversampling	0.0 %
Slices per slab	176
FoV read	256 mm
FoV phase	93.8 %
Slice thickness	1.20 mm
TR	2300 ms
TE	2.98 ms
Averages	1
Concatenations	1
Filter	Prescan Normalize
Coil elements	HEA;HEP

### Contrast

Magn. preparation	Non-sel. IR
T1	900 ms
Flip angle	9 deg
Fat suppr.	None
Water suppr.	None
Averaging mode	Long term
Reconstruction	Magnitude
Measurements	1
Multiple series	Off

### Resolution

Base resolution	256
Phase resolution	100 %
Slice resolution	100 %
Phase partial Fourier	Off
Slice partial Fourier	Off
Interpolation	Off
PAT mode	None
Matrix Coil Mode	Auto (CP)
Image Filter	Off
Distortion Corr.	Off
Unfiltered images	Off
Prescan Normalize	On
Normalize	Off
B1 filter	Off

Raw filter	Off
Elliptical filter	Off

### Geometry

Multi-slice mode	Single shot
Series	Interleaved

### System

Body	Off
HEP	On
HEA	On
Positioning mode	REF
Table position	H
Table position	0 mm
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Save uncombined	Off
Coil Combine Mode	Adaptive Combine
AutoAlign	---
Auto Coil Select	Default
Shim mode	Standard
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Sagittal
Rotation	0.00 deg
F >> H	256 mm
A >> P	240 mm
R >> L	212 mm

### Physio

1st Signal/Mode	None
Dark blood	Off
Resp. control	Off

### Inline

Subtract	Off
Std-Dev-Sag	Off
Std-Dev-Cor	Off
Std-Dev-Tra	Off
Std-Dev-Time	Off
MIP-Sag	Off
MIP-Cor	Off
MIP-Tra	Off
MIP-Time	Off
Save original images	On

### Sequence

Introduction	On
Dimension	3D
Elliptical scanning	Off
Asymmetric echo	Off
Bandwidth	240 Hz/Px
Flow comp.	No
Echo spacing	7.1 ms
RF pulse type	Fast
Gradient mode	Normal

# SIEMENS MAGNETOM TrioTim syngo MR B17

Excitation  
RF spoiling

Non-sel.  
On

# SIEMENS MAGNETOM TrioTim syngo MR B17

\\USER\MAC\Rankin\_lab\QUESTv2\VAXIAL\_T2\_STAR

TA: 4:53    PAT: Off    Voxel size: 1.0x1.0x4.0 mm    Rel. SNR: 1.00    SIEMENS: gre

### Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	Off
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

### Routine

Slice group 1	
Slices	44
Dist. factor	0 %
Position	Isocenter
Orientation	Transversal
Phase enc. dir.	R >> L
Rotation	90.00 deg
Phase oversampling	0 %
FoV read	256 mm
FoV phase	87.5 %
Slice thickness	4.0 mm
TR	650 ms
TE	20.00 ms
Averages	1
Concatenations	2
Filter	Distortion Corr.(2D), Prescan Normalize, Elliptical filter
Coil elements	HEA;HEP

### Contrast

TD	0 ms
MTC	Off
Magn. preparation	None
Flip angle	20 deg
Fat suppr.	None
Water suppr.	None
Averaging mode	Long term
Reconstruction	Magnitude
Measurements	1
Multiple series	Each measurement

### Resolution

Base resolution	256
Phase resolution	100 %
Phase partial Fourier	Off
Interpolation	Off
PAT mode	None
Matrix Coil Mode	Auto (CP)
Image Filter	Off
Distortion Corr.	On
Mode	2D
Unfiltered images	Off
Unfiltered images	Off
Prescan Normalize	On
Normalize	Off
B1 filter	Off

Raw filter	Off
Elliptical filter	On
Mode	Inplane

### Geometry

Multi-slice mode	Interleaved
Series	Interleaved
Saturation mode	Standard
Special sat.	None
Tim CT mode	Off

### System

Body	Off
NE2	Off
HEP	On
HEA	On
SP4	Off
SP2	Off
SP8	Off
SP6	Off
SP3	Off
SP1	Off
SP7	Off
SP5	Off

Positioning mode	REF
Table position	H
Table position	0 mm
MSMA	S - C - T
Sagittal	R >> L
Coronal	P >> A
Transversal	H >> F
Save uncombined	Off
Coil Combine Mode	Adaptive Combine
AutoAlign	---
Auto Coil Select	Default

Shim mode	Tune up
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
R >> L	350 mm
A >> P	263 mm
F >> H	350 mm

### Physio

1st Signal/Mode	None
Segments	1
Dark blood	Off
Resp. control	Off

### Inline

Subtract	Off
Liver registration	Off
Std-Dev-Sag	Off
Std-Dev-Cor	Off
Std-Dev-Tra	Off
Std-Dev-Time	Off

# SIEMENS MAGNETOM TrioTim syngo MR B17

MIP-Sag	Off
MIP-Cor	Off
MIP-Tra	Off
MIP-Time	Off
Save original images	On

---

Wash - In	Off
Wash - Out	Off
TTP	Off
PEI	Off
MIP - time	Off

## Sequence

---

Introduction	On
Dimension	2D
Phase stabilisation	Off
Asymmetric echo	Off
Contrasts	1
Bandwidth	200 Hz/Px
Flow comp.	Slice/Read
Allowed delay	20 s

---

RF pulse type	Fast
Gradient mode	Fast
Excitation	Slice-sel.
RF spoiling	On

# SIEMENS MAGNETOM TrioTim syngo MR B17

\\USER\MAC\Rankin\_lab\QUESTv2\Axial T2-FLAIR

TA: 4:05    PAT: 2    Voxel size: 1.0x1.0x4.0 mm    Rel. SNR: 1.00    SIEMENS: tse

### Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	Off
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

### Routine

Slice group 1	
Slices	44
Dist. factor	0 %
Position	Isocenter
Orientation	Transversal
Phase enc. dir.	R >> L
Rotation	90.00 deg
Phase oversampling	0 %
FoV read	256 mm
FoV phase	87.5 %
Slice thickness	4.0 mm
TR	9000 ms
TE	90.0 ms
Averages	1
Concatenations	3
Filter	Distortion Corr.(2D), Prescan Normalize, Elliptical filter
Coil elements	HEA;HEP

### Contrast

TD	0.0 ms
MTC	Off
Magn. preparation	Slice-sel. IR
TI	2500 ms
Freeze suppressed tissue	Off
Flip angle	150 deg
Fat suppr.	None
Water suppr.	None
Restore magn.	Off
-----	
Averaging mode	Long term
Reconstruction	Magnitude
Measurements	1
Multiple series	Each measurement

### Resolution

Base resolution	256
Phase resolution	100 %
Phase partial Fourier	Off
Trajectory	Cartesian
Interpolation	Off
-----	
PAT mode	GRAPPA
Accel. factor PE	2
Ref. lines PE	31
Matrix Coil Mode	Auto (Triple)
Reference scan mode	Integrated
-----	
Image Filter	Off

Distortion Corr. Mode	On
Unfiltered images	2D
Unfiltered images	Off
Prescan Normalize	Off
Normalize	On
B1 filter	Off
Raw filter	Off
Elliptical filter	On
Mode	Inplane

### Geometry

Multi-slice mode	Interleaved
Series	Interleaved
-----	
Special sat.	None
-----	
Tim CT mode	Off

### System

Body	Off
NE2	Off
HEP	On
HEA	On
SP4	Off
SP2	Off
SP8	Off
SP6	Off
SP3	Off
SP1	Off
SP7	Off
SP5	Off
-----	
Positioning mode	FIX
Table position	H
Table position	0 mm
MSMA	S - C - T
Sagittal	R >> L
Coronal	P >> A
Transversal	H >> F
Save uncombined	Off
Coil Combine Mode	Adaptive Combine
AutoAlign	---
Auto Coil Select	Default
-----	
Shim mode	Standard
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Transversal
Rotation	90.00 deg
A >> P	256 mm
R >> L	224 mm
F >> H	176 mm

### Physio

1st Signal/Mode	None
-----	
Dark blood	Off
-----	
Resp. control	Off

### Inline

Subtract	Off
----------	-----

# SIEMENS MAGNETOM TrioTim syngo MR B17

Std-Dev-Sag	Off
Std-Dev-Cor	Off
Std-Dev-Tra	Off
Std-Dev-Time	Off
MIP-Sag	Off
MIP-Cor	Off
MIP-Tra	Off
MIP-Time	Off
Save original images	On

## Sequence

Introduction	On
Dimension	2D
Compensate T2 decay	Off
Reduce Motion Sens.	Off
Contrasts	1
Bandwidth	222 Hz/Px
Flow comp.	No
Allowed delay	30 s
Echo spacing	8.19 ms
-----	
Define	Turbo factor
Turbo factor	16
Echo trains per slice	8
RF pulse type	Fast
Gradient mode	Fast

# SIEMENS MAGNETOM TrioTim syngo MR B17

\\USER\MAC\Rankin\_lab\QUESTv2\Axial T2 TSE with Fat Sat

TA: 3:02    PAT: Off    Voxel size: 1.0x1.0x4.0 mm    Rel. SNR: 1.00    SIEMENS: tse

## Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	Off
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

## Routine

Slice group 1	
Slices	44
Dist. factor	0 %
Position	Isocenter
Orientation	Transversal
Phase enc. dir.	R >> L
Rotation	90.00 deg
Phase oversampling	0 %
FoV read	256 mm
FoV phase	87.5 %
Slice thickness	4.0 mm
TR	3000 ms
TE	78 ms
Averages	1
Concatenations	4
Filter	Distortion Corr.(2D), Prescan Normalize, Elliptical filter
Coil elements	HEA;HEP

## Contrast

TD	0.0 ms
MTC	Off
Magn. preparation	None
Flip angle	150 deg
Fat suppr.	Fat sat.
Fat sat. mode	Strong
Water suppr.	None
Restore magn.	Off
-----	
Averaging mode	Long term
Reconstruction	Magnitude
Measurements	1
Multiple series	Off

## Resolution

Base resolution	256
Phase resolution	100 %
Phase partial Fourier	Off
Trajectory	Cartesian
Interpolation	Off
-----	
PAT mode	None
Matrix Coil Mode	Auto (CP)
-----	
Image Filter	Off
Distortion Corr.	On
Mode	2D
Unfiltered images	Off
Unfiltered images	Off

Prescan Normalize	On
Normalize	Off
B1 filter	Off
Raw filter	Off
Elliptical filter	On
Mode	Inplane

## Geometry

Multi-slice mode	Interleaved
Series	Interleaved
-----	
Special sat.	None
-----	
Tim CT mode	Off

## System

Body	Off
NE2	Off
HEP	On
HEA	On
SP4	Off
SP2	Off
SP8	Off
SP6	Off
SP3	Off
SP1	Off
SP7	Off
SP5	Off
-----	
Positioning mode	FIX
Table position	H
Table position	0 mm
MSMA	S - C - T
Sagittal	R >> L
Coronal	P >> A
Transversal	H >> F
Save uncombined	Off
Coil Combine Mode	Adaptive Combine
AutoAlign	---
Auto Coil Select	Default
-----	
Shim mode	Standard
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Transversal
Rotation	90.00 deg
A >> P	256 mm
R >> L	224 mm
F >> H	176 mm

## Physio

1st Signal/Mode	None
-----	
Dark blood	Off
-----	
Resp. control	Off

## Inline

Subtract	Off
Std-Dev-Sag	Off
Std-Dev-Cor	Off
Std-Dev-Tra	Off
Std-Dev-Time	Off

# SIEMENS MAGNETOM TrioTim syngo MR B17

MIP-Sag	Off
MIP-Cor	Off
MIP-Tra	Off
MIP-Time	Off
Save original images	On

## Sequence

Introduction	On
Dimension	2D
Compensate T2 decay	Off
Reduce Motion Sens.	Off
Contrasts	1
Bandwidth	186 Hz/Px
Flow comp.	No
Allowed delay	30 s
Echo spacing	11.2 ms
-----	
Define	Turbo factor
Turbo factor	16
Echo trains per slice	14
RF pulse type	Low SAR
Gradient mode	Normal

# SIEMENS MAGNETOM TrioTim syngo MR B17

\\USER\MAC\Rankin\_lab\QUESTv2\Ax DWI b1000

TA: 1:32    PAT: 2    Voxel size: 1.3x1.3x4.0 mm    Rel. SNR: 1.00    SIEMENS: ep2d\_diff

## Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	Off
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

## Routine

Slice group 1	
Slices	32
Dist. factor	20 %
Position	Isocenter
Orientation	Transversal
Phase enc. dir.	A >> P
Rotation	0.00 deg
Phase oversampling	0 %
FoV read	256 mm
FoV phase	100.0 %
Slice thickness	4 mm
TR	6000 ms
TE	101 ms
Averages	3
Concatenations	1
Filter	Raw filter, Prescan Normalize
Coil elements	HEA;HEP

## Contrast

MTC	Off
Magn. preparation	None
Fat suppr.	Fat sat.
Averaging mode	Long term
Reconstruction	Magnitude
Delay in TR	0 ms

## Resolution

Base resolution	192
Phase resolution	100 %
Phase partial Fourier	6/8
Interpolation	Off
PAT mode	GRAPPA
Accel. factor PE	2
Ref. lines PE	40
Matrix Coil Mode	Auto (Triple)
Reference scan mode	Separate
Distortion Corr.	Off
Prescan Normalize	On
Raw filter	On
Intensity	Weak
Slope	25
Elliptical filter	Off
Hamming	Off

## Geometry

Multi-slice mode	Interleaved
Series	Interleaved

## Special sat.

None

## System

Body	Off
HEP	On
HEA	On
SP4	Off
SP2	Off
SP8	Off
SP6	Off
SP3	Off
SP1	Off
SP7	Off
SP5	Off

## Positioning mode

REF

Table position	H
Table position	0 mm
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combine Mode	Adaptive Combine
AutoAlign	---
Auto Coil Select	Default

## Shim mode

Standard

Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
R >> L	256 mm
A >> P	256 mm
F >> H	153 mm

## Physio

1st Signal/Mode	None
Resp. control	Off

## Diff

Diffusion mode	Orthogonal
Diff. weightings	2
b-value 1	0 s/mm <sup>2</sup>
b-value 2	1000 s/mm <sup>2</sup>
Diff. weighted images	On
Trace weighted images	On
Average ADC maps	On
Individual ADC maps	Off
FA maps	Off
Mosaic	Off
Tensor	Off
Noise level	40
Diff. directions	3

## Sequence

Introduction	On
Bandwidth	1240 Hz/Px
Free echo spacing	Off
Echo spacing	0.89 ms
EPI factor	192

# SIEMENS MAGNETOM TrioTim syngo MR B17

RF pulse type  
Gradient mode

Normal  
Fast

# SIEMENS MAGNETOM TrioTim syngo MR B17

\\USER\MAC\Rankin\_lab\QUESTv2\Cor DWI b1000

TA: 2:09    PAT: 2    Voxel size: 1.3x1.3x4.0 mm    Rel. SNR: 1.00    SIEMENS: ep2d\_diff

## Properties

Prio Recon	Off
Before measurement	
After measurement	
Load to viewer	On
Inline movie	Off
Auto store images	On
Load to stamp segments	Off
Load images to graphic segments	Off
Auto open inline display	Off
Start measurement without further preparation	On
Wait for user to start	Off
Start measurements	single

## Routine

Slice group 1	
Slices	36
Dist. factor	20 %
Position	Isocenter
Orientation	Coronal
Phase enc. dir.	R >> L
Rotation	0.00 deg
Phase oversampling	0 %
FoV read	256 mm
FoV phase	100.0 %
Slice thickness	4.0 mm
TR	8500 ms
TE	134 ms
Averages	3
Concatenations	1
Filter	Raw filter, Prescan Normalize
Coil elements	HEA;HEP

## Contrast

MTC	Off
Magn. preparation	None
Fat suppr.	Fat sat.
-----	
Averaging mode	Long term
Reconstruction	Magnitude
Delay in TR	0 ms

## Resolution

Base resolution	192
Phase resolution	100 %
Phase partial Fourier	6/8
Interpolation	Off
-----	
PAT mode	GRAPPA
Accel. factor PE	2
Ref. lines PE	24
Matrix Coil Mode	Auto (Triple)
Reference scan mode	Separate
-----	
Distortion Corr.	Off
Prescan Normalize	On
Raw filter	On
Intensity	Weak
Slope	25
Elliptical filter	Off
Hamming	Off

## Geometry

Multi-slice mode	Interleaved
Series	Interleaved

Special sat.                      None

## System

Body	Off
HEP	On
HEA	On
SP4	Off
SP2	Off
SP8	Off
SP6	Off
SP3	Off
SP1	Off
SP7	Off
SP5	Off

Positioning mode	REF
Table position	H
Table position	0 mm
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combine Mode	Adaptive Combine
AutoAlign	---
Auto Coil Select	Default

Shim mode	Standard
Adjust with body coil	Off
Confirm freq. adjustment	Off
Assume Silicone	Off
? Ref. amplitude 1H	0.000 V
Adjustment Tolerance	Auto
Adjust volume	
Position	Isocenter
Orientation	Coronal
Rotation	0.00 deg
F >> H	256 mm
R >> L	256 mm
A >> P	172 mm

## Physio

1st Signal/Mode	None
-----	
Resp. control	Off

## Diff

Diffusion mode	Orthogonal
Diff. weightings	2
b-value 1	0 s/mm <sup>2</sup>
b-value 2	1000 s/mm <sup>2</sup>
Diff. weighted images	On
Trace weighted images	On
Average ADC maps	On
Individual ADC maps	Off
FA maps	Off
Mosaic	Off
Tensor	Off
Noise level	40
Diff. directions	3

## Sequence

Introduction	On
Bandwidth	1184 Hz/Px
Free echo spacing	Off
Echo spacing	0.93 ms
-----	
EPI factor	192

# SIEMENS MAGNETOM TrioTim syngo MR B17

RF pulse type  
Gradient mode

Normal  
Fast