REVISED: 3.0T ADNI-Related GE 14.0 M4 Software, TwinSpeed Gradient and 8-channel Brain Coil

This protocol provides suggested imaging parameters for research studies that want to approximate the imaging methods used in the ADNI study using 14.0 M4 HDx software at 3T, but do not have access to an MP-RAGE pulse sequence. For more details see the document: "Use of ADNI MRI Methods for Non-ADNI Studies" .

Accept the "First Operating Mode" pop-up in Series 1. Consult the scanner's user's manual to understand this choice and its implications.

***The head portion of the 16-channel head-neck-spine (HNS) can be used instead of the 8-channel brain coil for the entire study, if desired.**

Important Note added 8/2010: The recommended 3T ADNI-related IR-FSPGR parameters have been changed in this version of the document to match those used in the ADNI-GO study. The revised parameters are highlighed in yellow. The revised parameters give improved gray-white contrast.

We recommend that any new studies use the revised parameters. We do NOT recommend changing parameters midway through any longitudinal study, however.

			IMAGING PARAMETERS		*ACQUISITION TIMING*
SERIES	1. 3 plane loc.	scan plane	3-plane	matrix/nex	256 / 128 / 1
coil	8hrbrain*	mode	(Whole Body gradient)	fov (cm)	26
etl		SAT		slice/space	5 / 5
scan time	:13			autoshim	On

comments Use 8-channel brain coil*.

SERIES	2. Calibration Scan.	scan plane	axial	matrix/nex	default
coil	8hrbrain*	mode	(Whole Body gradient)	fov (cm)	30
etl		SAT		slice/space	6/0 43 slices
scan time	:13			autoshim	off

comments Used for PURE B1-correction. Be sure to cover brain completely.
(Although 14.0 M4 does not support PURE for 3T, this acquisition of the PURE calibration scan is recommended for retrospective processing in case PURE becomes compatible in future releases.)

			IMAGING PARAMETERS		*ACQUISITION TIMING*
SERIES	3. Sag IR-FSPGR	scan plane	Sag	matrix/nex	256 / 256 / 1
coil	8hrbrain*	mode	3D (ZOOM gradient)	phase fov	1.00
	SCAN TIMING	pulse seq	SPGR	locs/pause	
#echos	1	image opts.	EDR, IrPrep, Fast	freq. direct.	S/I
te	min full	psd name	efgre3d_cs	fc direct	
Prep time	400		*ADDITIONAL PARAMETERS*	phase corr	
flip angle	11		Image acq. delay = 0	autoshim	On
etl		User CVs	Turbo mode = 1		*SCANNING RANGE*
bw1/bw2	31.25		Slice resolution = 100%	fov	26
scan time	8:54			slice/space	1.2mm 200 locs/slab

comments Cover skin to skin. Remind the patient to hold still for this scan.

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			IMAGING PARAMETERS		
SERIES	4.IR-FSPGR-repeat	scan plane	Sag	matrix/nex	256 / 256 / 1
coil	8hrbrain*	mode	3D (ZOOM gradient)	phase fov	1.00
	SCAN TIMING	pulse seq	SPGR	locs/pause	
#echos	1	image opts.	EDR, IrPrep, Fast	freq. direct.	S/I
te	min full	psd name	efgre3d_cs	fc direct	
Prep time	400		ADDITIONAL PARAMETERS	phase corr	
flip angle	11		Image acq. delay = 0	autoshim	Auto
etl		User CVs	Turbo mode = 1		SCANNING RANGE
bw1/bw2	31.25		Slice resolution = 100%	fov	26
scan time	8:54			slice/space	1.2mm 200 locs/slab

comments Prescribe same image locations as series 2, unless adjustment is needed (e.g. to correct for wrap).
Remind the patient to hold still for this scan.

NOTE: Be sure to select the "**Copy FOV, Thickness, Spacing**" button for the graphic prescription.
Otherwise, if you copy the slice locations from series 2, the number of slices might be reduced.

SERIES	5. Sag B1 Cal PA	scan plane	Sag	matrix/nex	128 / 128 / 1
coil	8hrbrain*	mode	3D (ZOOM gradient)	phase fov	
	SCAN TIMING	pulse seq	GRE	locs/pause	
#echos	1	image opts.	EDR, Fast	freq. direct.	S/I
te	min full	psd name		fc direct	
tr			ADDITIONAL PARAMETERS	Auto Shim	On
flip angle	2		Image acq. delay=0		SCANNING RANGE
etl		User CVs	turbo Mode =1	fov	30
bw1/bw2	62.5		slice resolution = 100%	slice/space	2.5mm locs/slab=96
scan time	:36				

comments Cover skin to skin. Series 5 and 6 are used for B1-correction, if PURE is not available.

SERIES	6. Sag B1 Cal PA	scan plane	Sag	matrix/nex	128 / 128 / 1
coil	**BODY**	mode	3D (ZOOM gradient)	phase fov	
	SCAN TIMING	pulse seq	GRE	locs/pause	
#echos	1	image opts.	EDR, Fast	freq. direct.	S/I
te	min full	psd name		fc direct	
tr			ADDITIONAL PARAMETERS	Auto Shim	Off
flip angle	2		Image acq. Delay=0		SCANNING RANGE
etl		User CVs	Turbo Mode =1	fov	30
bw1/bw2	62.5		Slice resolution = 100%	slice/space	2.5mm locs/slab=96
scan time	:36				

comments Turn Body Coil on for this scan. Leave 8hrbrain* coil plugged in, but accept change to Body Coil
(In other words, select "**Apply**"). Same image locations as series 5.

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			IMAGING PARAMETERS		ACQUISITION TIMING
SERIES	7. Ax PD/T2 FSE	scan plane	Ax	matrix/nex	256 / 256 / 1
coil	8hrbrain*	mode	2D (ZOOM gradient)	phase fov	0.9
	SCAN TIMING	pulse seq	FSE-XL	acqs/pause	0
#echoes	**2**	image opts.	EDR, Fast	freq. direct.	A/P
te	min full / TE2=97.2	psd name		fc direct	
TR	3000		ADDITIONAL PARAMETERS	Autoshim	Off
flip angle				phase corr	
etl	16	User CVs	blurring cancellation=0		SCANNING RANGE
bw1/bw2	20.83		Enh. fine line suppr.=0	fov	24
scan time	4:49			slice/space	48 loc, 3mm interleaved

comments Accept change back to 8-channel brain* coil. (In other words, select "**Apply**").
Prescribe 48 slices to cover head.

Series 7 is the final patient series.

Follow the ADNI instructions to complete the phantom scans.