

### 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.

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

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

<b>SERIES</b>	3. Sag IR-FSPGR	scan plane mode	<i>IMAGING PARAMETERS</i>		<i>ACQUISITION TIMING</i>	
	coil 8hrbrain*			Sag 3D ( ZOOM gradient) SPGR	matrix/nex phase fov locs/pause freq. direct. fc direct	256 / 256 / 1 0.94 S/I
#echos	1	pulse seq	EDR, IrPrep, Fast	fc direct		
te	min full	image opts.	efgre3d_cs	phase corr		
Prep time	650	psd name	<i>ADDITIONAL PARAMETERS</i>	autoshim	On	
flip angle	8	User CVs	Image acq. delay = 0			
etl			Turbo mode = 1	fov		<i>SCANNING RANGE</i>
bw1/bw2	31.25		Slice resolution = 100%	slice/space	26	1.2mm 170 locs/slab
scan time	9:43					
comments	Cover skin to skin. Remind the patient to hold still for this scan.					

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<b>SERIES</b> coil	4.IR-FSPGR-repeat	scan plane mode	<i>IMAGING PARAMETERS</i>		matrix/nex	256 / 256 / 1
	8hrbrain*		Sag	3D (ZOOM gradient)	phase fov	0.94
#echos te	<i>SCAN TIMING</i>		pulse seq	SPGR	locs/pause	
	1	min full	image opts.	EDR, IrPrep, Fast	freq. direct.	S/I
Prep time	650	psd name	efgre3d_cs	fc direct		
flip angle	8	User CVs	<i>ADDITIONAL PARAMETERS</i>		phase corr	
etl			Image acq. delay = 0	Turbo mode = 1	autoshim	Auto
bw1/bw2	31.25		Slice resolution = 100%	fov	SCANNING RANGE	
scan time	9:43			slice/space	26 1.2mm 170 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.

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

<b>SERIES</b> coil	6. Sag B1 Cal PA	scan plane mode	<i>IMAGING PARAMETERS</i>		matrix/nex	128 / 128 / 1
	<b>BODY</b>		Sag	3D (ZOOM gradient)	phase fov	
#echos te	<i>SCAN TIMING</i>		pulse seq	GRE	locs/pause	
	1	min full	image opts.	EDR, Fast	freq. direct.	S/I
tr		psd name		fc direct		
flip angle	2	User CVs	<i>ADDITIONAL PARAMETERS</i>		Auto Shim	Off
etl			Image acq. Delay=0	Turbo Mode =1	fov	SCANNING RANGE
bw1/bw2	62.5		Slice resolution = 100%	slice/space	30 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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<b>SERIES</b>	7. Ax PD/T2 FSE	scan plane	<i>IMAGING PARAMETERS</i>		<i>ACQUISITION TIMING</i>	
	8hrbrain*		mode	Ax	matrix/nex	256 / 256 / 1
<b>coil</b>			2D (ZOOM gradient)	phase fov	0.9	
	<i>SCAN TIMING</i>	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	User CVs	<i>ADDITIONAL PARAMETERS</i>	Autoshim	Off	
flip angle			blurring cancellation=0	phase corr		
etl	16		Enh. fine line suppr.=0	fov	24	<i>SCANNING RANGE</i>
bw1/bw2	20.83			slice/space	48 loc, 3mm interleaved	
scan time	4:49					
comments	Accept change back to 8-channel brain* coil. (In other words, select " <b>Apply</b> "). Prescribe 48 slices to cover head.					

**Series 7 is the final patient series.**

**Follow the ADNI instructions to complete the phantom scans.**