GE HealthCare

MR 30 for SIGNA™

ARIA Monitoring Consensus Protocol

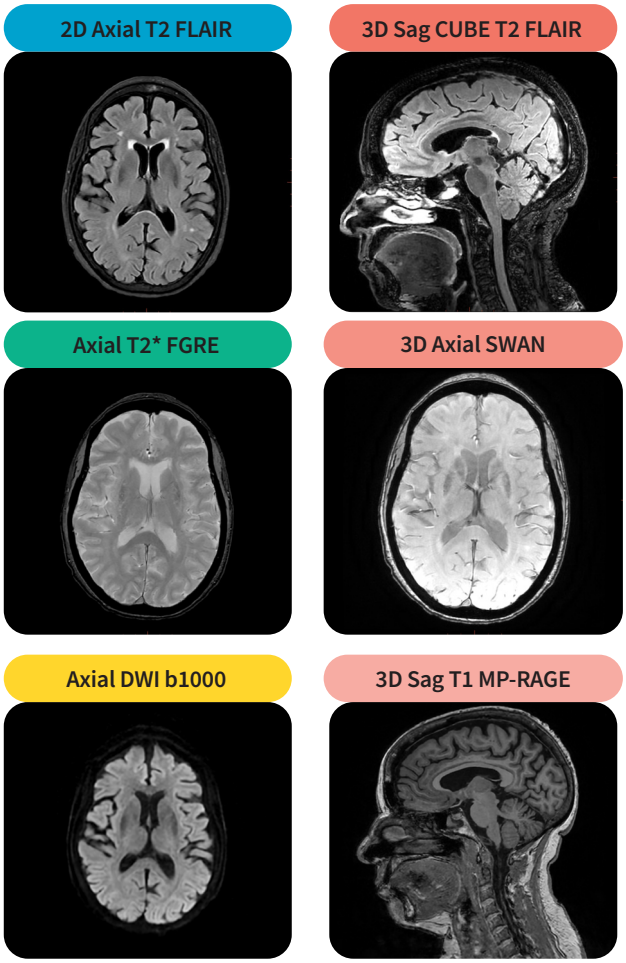
The following details define the GE HealthCare SIGNA™ MR scan protocol that meets the American Society for Neuroradiology (ASNR) Consensus criteria for the evaluation of Amyloid Realted Imaging Abnormalities (ARIA)[1].

Essential Series

- 3 Plane Localizer
- 2D Axial T2 FLAIR
- Axial T2* FGRE
- Axial DWI b1000

Optional Series

- 3D Sag CUBE T2 FLAIR
- 3D Axial SWAN
- 3D Sag T1 MP-RAGE



Take your imaging to the next level with SIGNA™,[2]

Use **AIR™ Recon DL** to reduce scan time by up to 50%

Use **AIRx™ Brain** to automatically place slices and reduce setup

Leverage integrated **cloud-based quantification** tools for white-matter, grey-matter and segmentation

1. Cogswell PM, et al. AJNR Am J Neuroradiol. 2022;43(9):E19-E35.
2. Some options are available for purchase

JB25644XX | May 2024

ARIA Monitoring Consensus Protocol - 1.5T

	2D Axial T2 FLAIR	Axial T2* FGRE	Axial DWI b1000	3D Sag CUBE T2 FLAIR	3D Axial SWAN	3D Sag T1 MP-RAGE
Imaging Parameters						
Imaging Mode	2D	2D	2D	3D	3D	3D
Pulse Sequence	FSE	Gradient Echo	Spin Echo	CUBE T2 FLAIR	SWAN	MP-RAGE
Imaging Options	FC, EDR, TRF, Fast, ARC, MRF, T2flair	EDR, MRF, Fast	EPI, EDR, DIFF, Asset	EDR, Fast, ARC, HS, IrP, MRF, T2P	FC, EDR, ARC, HS, Fast	EDR, Fast, ARC, HS, IrP
Phase Acceleration	2.0	-	2.0	2.0	2.0	1.5
Slice Acceleration	1.0	-	1.0	1.0	1.5	1.0
HyperSense Factor				1.2	1.0	1.2
Scan Range						
FOV (cm)	22.0	22.0	24.0	22.0	20.0	25.6
Slice Thickness (mm)	4.0	4.0	4.0	0.50	1.2	0.5
Slice Spacing (mm)	0.4	0.4	0.4	-	-	-
Slice Resolution	-	-	-	50%	50%	50%
Acquisition Timing						
Frequency	300	224	120	224	288	256
Phase	200	200	160	224	288	256
Phase FOV	1.0	0.9	1.0	1.0	0.9	1.0
NEX	1.0	1.0	2.0	1.0	0.7	1.0
Flow Comp Direction	Slice	-	-	-	-	-
Phase Image	-	-	-	-	Yes	-
Scan Timing						
Flip Angle	Auto (160)	20.0	-	-	25.0	12.0
TE	130	25	Minimum	90	35.9	3.1
TR	10,000	600	Auto (9,163)	5,500	Minimum	7.7
TI	Auto (2,687)	-	-	Auto (1,597)	-	799
# Echoes	1	1	1	1	3	1
Echo Train Length	20	-	-	200	-	-
Chem Sat	Fat	-	Fat	-	-	-
Receiver Bandwidth	50	35	250	50	15.63	31

The values in the table represent scan parameters developed with the 1.5T SIGNA™ Artist system using AIR™ Recon DL. Final parameters values may differ depending on your system's available software options.

JB25644XX | May 2024

3 Plane Localizer

3-Plane Localizer - 3-Plane Localizer

IMAGING PARAMETERS	
Imaging Mode	*2D*
Pulse Sequence	*Spin Echo*
Imaging Options	*Seq, EDR, TRF, Fast, SS, ARC, MRF*
Phase	*2.00*

SCAN RANGE	
FOV	*30.0*
Slice Thickness	*10.00*
Slice Spacing	*0.0*
Overlap Locations	*0*

ACQ TIMING	
Freq	*288*
Phase	*192*
Freq DIR	*Unswap*
# of Acq. Before Pause	*0*
Phase FOV	*1.00*
Auto Shim	*Auto*
Phase Correction	*No*
RF Drive Mode	*Single*
Excitation Mode	*Selective*

FMRI	
PSD Trigger	*Internal*
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*

SCAN TIMING	
TE	*80.0*
Number of Echoes	*1*
TR	*664.9*
Receiver Bandwidth	*83.33*

IMAGE ENHANCE	
Filter Choice	*None*

USER CVS	
User CV1	*1.00*
User CV Mask2	*0*

MULTI-PHASE	
Seperate Series	*0*
Mask Phase	*0*
Mask Pause	*0*
Preserve	*0*

DIFFUSION	
Recon All Images	*On*
# Synthetic b-values	*1*
Synthetic b-value	*1000.0;*

CONTRAST	
Contrast Yes/No	*No*

3-Plane Localizer - 3-Plane Localizer

2D Axial T2 FLAIR

Ax T2 FLAIR FS - Ax T2 FLAIR FS

IMAGING PARAMETERS	
Imaging Mode	*2D*
Pulse Sequence	*FSE-XL*
Imaging Options	*FC, EDR, TRF, Fast, ARC, MRF, T2flair*
Phase	*2.00*

SCAN RANGE	
FOV	*22.0*
Slice Thickness	*4.00*
Slice Spacing	*0.4*
Overlap Locations	*0*
Number of Slices	*36*

ACQ TIMING	
Freq	*300*
Phase	*200*
Freq DIR	*Unswap*
Fat Shift DIR	*Normal*
NEX	*1.00*
Phase FOV	*1.00*
Auto Shim	*Auto*
Phase Correction	*No*
Flow Direction Compensation	*Slice*
RF Drive Mode	*Single*
Excitation Mode	*Selective*

FMRI	
PSD Trigger	*Internal*
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	*3*

SCAN TIMING	
Flip Angle	*160.0*
TE	*130.0*
Number of Echoes	*1*
TR	*10000.0*
TI	*2687*
Echo Train Length	*20*
Receiver Bandwidth	*50.00*

IMAGE ENHANCE	
Filter Choice	*None*

USER CVS	
User CV18	*1.00*
User CV19	*1.00*
User CV Mask2	*0*

MULTI-PHASE	
Seperate Series	*0*
Mask Phase	*0*
Mask Pause	*0*
Preserve	*0*

DIFFUSION	
Recon All Images	*On*
# Synthetic b-values	*1*
Synthetic b-value	*1000.0;*

CONTRAST	
Contrast Yes/No	*No*

Ax T2 FLAIR FS - Ax T2 FLAIR FS

Axial T2* FGRE

Ax T2* FGRE - Ax T2* FGRE

IMAGING PARAMETERS	
Imaging Mode	*2D*
Pulse Sequence	*Gradient Echo*
Imaging Options	*EDR, Fast, MRF*
SCAN RANGE	
FOV	*22.0*
Slice Thickness	*4.00*
Slice Spacing	*0.4*
Overlap Locations	*0*
Number of Slices	*36*
ACQ TIMING	
Freq	*224*
Phase	*200*
Freq DIR	*A/P*
NEX	*1.00*
# of Acq. Before Pause	*0*
Phase FOV	*0.90*
Auto Shim	*Auto*
Phase Correction	*No*
RF Drive Mode	*Single*
Excitation Mode	*Selective*
USER CVS	
User CV Mask2	*0*
MULTI-PHASE	
Seperate Series	*0*
Mask Phase	*0*
Mask Pause	*0*
Preserve	*0*
DIFFUSION	
Recon All Images	*On*
# Synthetic b-values	*1*
Synthetic b-value	*1000.0;*
CONTRAST	
Contrast Yes/No	*No*

SCAN TIMING	
Flip Angle	*20.0*
TE	*25.0*
Number of Echoes	*1*
TR	*600.0*
Receiver Bandwidth	*35.71*
IMAGE ENHANCE	
Filter Choice	*None*
GATING/TRIGGER	
Pause After Navigator Prescan	*0*
FMRI	
PSD Trigger	*Internal*
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	*3*

Ax T2* FGRE - Ax T2* FGRE

Axial DWI b1000

Ax DWI ALL b1000 - Ax DWI ALL b1000

IMAGING PARAMETERS	
Imaging Mode	*2D*
Pulse Sequence	*Spin Echo*
Imaging Options	*EDR, EPI, DIFF, Asset*
Phase	*2.00*

SCAN RANGE	
FOV	*24.0*
Slice Thickness	*4.00*
Slice Spacing	*0.4*
Overlap Locations	*0*
Number of Slices	*36*

ACQ TIMING	
Freq	*120*
Phase	*160*
Freq DIR	*R/L*
Phase FOV	*1.00*
Auto Shim	*Auto*
Phase Correction	*Yes*
RF Drive Mode	*Single*
Excitation Mode	*Selective*

FMRI	
PSD Trigger	*Internal*
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*

SCAN TIMING	
TE	*Minimum*
Number of Echoes	*1*
TR	*9163.0*
Number of Shots	*1*

IMAGE ENHANCE	
Filter Choice	*None*

USER CVS	
User CV0	*1.00*
User CV5	*1.00*
User CV7	*1.00*
TR Min	*2000.0*
TR Max	*17000.0*
User CV Mask2	*0*

MULTI-PHASE	
Seperate Series	*0*
Mask Phase	*0*
Mask Pause	*0*
Preserve	*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*
Multi b-values	*1000.0;*
Multi NEX Values	*2.0;*
NEX For T2	*1.00*
Real Time Field Adjustment	*1*
# Synthetic b-values	*0*

CONTRAST	
Contrast Yes/No	*No*

Ax DWI ALL b1000 - Ax DWI ALL b1000

Optional Series

3D Sag CUBE T2 FLAIR

3D Sag T2 FLAIR Cube - 3D Sag T2 FLAIR Cube

IMAGING PARAMETERS	
Imaging Mode	*3D*
Pulse Sequence	*Cube T2 FLAIR*
Imaging Options	*EDR, Fast, T2P, ARC, MRF, HS, IrP*
Phase	*2.00*
Slice	*1.00*
HyperSense	*1.20*

SCAN RANGE	
FOV	*22.0*
Slice Thickness	*0.50*
Location per Slab	*260*
Overlap Locations	*0*
Number of Slices	*1*

ACQ TIMING	
Freq	*224*
Phase	*224*
Freq DIR	*S/I*
Fat Shift DIR	*Normal (S)*
NEX	*1.00*
Phase FOV	*1.00*
Auto Shim	*Auto*
Phase Correction	*No*
RF Drive Mode	*Single*
Excitation Mode	*Selective*

FMRI	
PSD Trigger	*Internal*
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*

SCAN TIMING	
TE	*90.0*
Number of Echoes	*1*
TR	*5500.0*
TI	*1597*
Echo Train Length	*200*
Receiver Bandwidth	*50.00*

IMAGE ENHANCE	
Filter Choice	*None*

USER CVS	
User CV5	*1.00*
User CV11	*20.00*
User CV34	*100.00*
User CV Mask2	*10*

MULTI-PHASE	
Seperate Series	*0*
Mask Phase	*0*
Mask Pause	*0*
Preserve	*0*

DIFFUSION	
Recon All Images	*On*
# Synthetic b-values	*1*
Synthetic b-value	*1000.0;*

CONTRAST	
Contrast Yes/No	*No*

3D Sag T2 FLAIR Cube - 3D Sag T2 FLAIR Cube

Optional Series

3D Axial SWAN

3D Ax SWAN - 3D Ax SWAN

IMAGING PARAMETERS	
Imaging Mode	*3D*
Pulse Sequence	*SWAN*
Imaging Options	*FC, EDR, Fast, ZIP512, ARC, MRF, HS*
Phase	*2.00*
Slice	*1.50*
HyperSense	*1.00*

SCAN RANGE	
FOV	*20.0*
Slice Thickness	*1.20*
Location per Slab	*160*
Overlap Locations	*0*
Number of Slices	*1*

ACQ TIMING	
Freq	*288*
Phase	*288*
Freq DIR	*A/P*
Phase FOV	*0.90*
Auto Shim	*Auto*
Phase Correction	*No*
RF Drive Mode	*Single*
Excitation Mode	*Selective*
Phase Image	*0*

FMRI	
PSD Trigger	*Internal*
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	*2*

SCAN TIMING	
Flip Angle	*25.0*
TE	*35.9*
Number of Echoes	*3*
TR	*Minimum*
Receiver Bandwidth	*15.63*

IMAGE ENHANCE	
Filter Choice	*None*

USER CVS	
User CV16	*20.00*
User CV30	*1.00*
User CV34	*70.00*
User CV Mask2	*8*

MULTI-PHASE	
Seperate Series	*0*
Mask Phase	*0*
Mask Pause	*0*
Preserve	*0*

DIFFUSION	
Recon All Images	*On*
# Synthetic b-values	*1*
Synthetic b-value	*1000.0;*

CONTRAST	
Contrast Yes/No	*No*

3D Ax SWAN - 3D Ax SWAN

Optional Series

3D Sag T1 MP-RAGE

3D Sag T1 MP-RAGE - 3D Sag T1 MP-RAGE

IMAGING PARAMETERS	
Imaging Mode	*3D*
Pulse Sequence	*MP-RAGE*
Imaging Options	*EDR, Fast, ARC, MRF, HS, IrP*
Phase	*1.50*
Slice	*1.00*
HyperSense	*1.20*

SCAN RANGE	
FOV	*25.6*
Slice Thickness	*0.50*
Location per Slab	*260*
Overlap Locations	*0*
Number of Slices	*1*

ACQ TIMING	
Freq	*256*
Phase	*256*
Freq DIR	*S/I*
Fat Shift DIR	*Normal (S)*
NEX	*1.00*
Phase FOV	*1.00*
Auto Shim	*Auto*
Phase Correction	*No*
RF Drive Mode	*Single*
Excitation Mode	*Selective*

FMRI	
PSD Trigger	*Internal*
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	*2*

SCAN TIMING	
Flip Angle	*12.0*
Number of Echoes	*1*
TI	*799*
Receiver Bandwidth	*31.25*
Recovery Time	*700*

IMAGE ENHANCE	
Filter Choice	*None*

USER CVS	
User CV6	*1.00*
User CV Mask2	*16384*

MULTI-PHASE	
Seperate Series	*0*
Trigger Delay without AV	*0*
Mask Phase	*0*
Mask Pause	*0*
Preserve	*0*

DIFFUSION	
Recon All Images	*On*
# Synthetic b-values	*1*
Synthetic b-value	*1000.0;*

CONTRAST	
Contrast Yes/No	*No*

3D Sag T1 MP-RAGE - 3D Sag T1 MP-RAGE