\\USER\Research\19028_KGarner\Protocols v1 17072019\Tune_up_shim

TA: 0:25 PAT:	2 Voxel size: 2.7×2.7×2.7 m	nm Rel. SNR: 1.00 USEI	R: CV_shim_452B
D		Distortion Corr.	Off
Properties		- Prescan Normalize	Off
Prio Recon	Off	Normalize	Off
Before measurement		B1 filter	Off
After measurement	_	Raw filter	Off
Load to viewer	On	Elliptical filter	Off
Inline movie	Off	POCS	Off
Auto store images	On	ı	
Load to stamp segments	Off	Geometry	
Load images to graphic	Off	Multi-slice mode	Sequential
segments		Series	Ascending
Auto open inline display	Off	Special sat.	None
Start measurement without	On		
further preparation	0"	Table position	Н
Wait for user to start	Off	Table position	0 mm
Start measurements	single	Inline Composing	Off
Routine		I milite Composing	Oli
Slab group 1		System	
Slabs	1	V32	Off
Dist. factor	20 %	A32	On
Position	R2.6 A25.6 F35.3	Positioning mode	DEE
Orientation	Sagittal	Positioning mode	REF
Phase enc. dir.	A >> P	MSMA	S-C-T
Rotation	0.00 deg	Sagittal	R >> L
Auto	Off	Coronal	A >> P
Phase oversampling	0 %	Transversal	F >> H
Slice oversampling	11.1 %	Save uncombined	Off
Slices per slab	72	Coil Combine Mode	Adaptive Combine
FoV read	256 mm	AutoAlign	
FoV phase	100.0 %	Auto Coil Select	Default
Slice thickness	2.67 mm	Shim mode	Tune up
TR	2.67 Hilli 288.00 ms	Adjust with body coil	Off
		Confirm freq. adjustment	Off
TE 1	1.02 ms	Assume Silicone	Off
TE 2	3.06 ms	! Ref. amplitude 1H	240.000 V
Averages	1	Adjustment Tolerance	Auto
Concatenations	1 N	Adjust volume	Auto
Filter	None		laccenter
Coil elements	A32	Position	Isocenter
Contrast		Orientation	Transversal
Magn. preparation	None	Rotation	0.00 deg
Flip angle	10 deg	R >> L	350 mm
Fat suppr.	None	A >> P	263 mm
Restore magn.	Off	F >> H	350 mm
	-	Physio	
Averaging mode	Long term	1st Signal/Mode	None
Reconstruction	Magnitude	Segments	60
Measurements	1		
Multiple series	Off	Tagging	None
Resolution		Dark blood	Off
Base resolution	96	- Cine	Off
Phase resolution	100 %	Inline ventricular function	Off
Slice resolution	100 %	Resp. control	Off
Phase partial Fourier	Off	•	J
Slice partial Fourier	Off	Inline	
Trajectory	Cartesian	Subtract	Off
Interpolation	Off	Std-Dev-Sag	Off
	OII	Std-Dev-Cor	Off
PAT mode	GRAPPA	Std-Dev-Tra	Off
Accel. factor PE	2	Std-Dev-Time	Off
Ref. lines PE		MIP-Sag	Off
Accel. factor 3D	1	MIP-Cor	Off
	Integrated	MIP-Tra	Off
Reference scan mode Image Filter	Integrated Off	MIP-Tra MIP-Time	Off Off

Introduction	On
Dimension	3D
Elliptical scanning	Off
Reordering	Linear
Asymmetric echo	Weak
Contrasts	2
Bandwidth 1	854 Hz/Px
Bandwidth 2	854 Hz/Px
Flow comp. 1	No
Flow comp. 2	No
Readout mode	Monopolar
Optimization	None
Allowed delay	0 s
Echo spacing	4.8 ms
Sequence type	Gre
Define	Shots
Shots per slice	1
RF pulse type	Fast
Gradient mode	Fast
Excitation	Non-sel.
Flip angle mode	Constant
RF spoiling	On
Phase Enc. Rewinder	On

\\USER\Research\19028_KGarner\Protocols v1 17072019\Standard_Shim

TA: 0:33 PAT:	2 Voxel size: 2.7×2.7×2	2.7 mm Rel. SNR: 1.00 USE	R: CV_shim_452B
.		Distortion Corr.	Off
Properties		Prescan Normalize	Off
Prio Recon	Off	Normalize	Off
Before measurement		B1 filter	Off
After measurement		Raw filter	Off
Load to viewer	On	Elliptical filter	Off
Inline movie	Off	POCS	Off
Auto store images	On	1	
Load to stamp segments	Off	Geometry	
Load images to graphic	Off	Multi-slice mode	Sequential
segments	0"	Series	Ascending
Auto open inline display	Off	Special sat.	None
Start measurement without	On		
further preparation	0#	Table position	 Н
Wait for user to start	Off	Table position	0 mm
Start measurements	single	Inline Composing	Off
Routine			
Slab group 1		System	~~
Slabs	1	V32	Off
Dist. factor	20 %	A32	On
Position	R2.6 A25.6 F35.3	Positioning mode	REF
Orientation	Sagittal	MSMA	S-C-T
Phase enc. dir.	A >> P	Sagittal	R >> L
Rotation	0.00 deg	Coronal	A >> P
Auto	Off	Transversal	F >> H
Phase oversampling	0 %	Save uncombined	Off
Slice oversampling	11.1 %	Coil Combine Mode	Adaptive Combine
Slices per slab	72	AutoAlign	
FoV read	256 mm	Auto Coil Select	Default
FoV phase	100.0 %		
Slice thickness	2.67 mm	Shim mode	Standard
TR	410.40 ms	Adjust with body coil	Off
TE 1	1.02 ms	Confirm freq. adjustment	Off
TE 2	5.10 ms	Assume Silicone	Off
Averages	1	! Ref. amplitude 1H	240.000 V
Concatenations	1	Adjustment Tolerance	Auto
Filter	None	Adjust volume	
Coil elements	A32	Position	R2.6 A25.6 F35.3
Contrast		Orientation	Sagittal
	None	Rotation	0.00 deg
Magn. preparation	None	F >> H	256 mm
Flip angle	10 deg None	A >> P	256 mm
Fat suppr.		R >> L	193 mm
Restore magn.	Off	····· Physio	
Averaging mode	Long term	1st Signal/Mode	None
Reconstruction	Magnitude	Segments	60
Measurements	1		
Multiple series	Off	Tagging	None
Resolution		Dark blood	Off
	06	Cine	Off
Base resolution	96	Inline ventricular function	Off
Phase resolution	100 %	Resp. control	Off
Slice resolution	100 %	Resp. control	Oil
Phase partial Fourier	Off	Inline	
Slice partial Fourier	Off	Subtract	Off
Trajectory	Cartesian	Std-Dev-Sag	Off
Interpolation	Off	Std-Dev-Cor	Off
PAT mode	GRAPPA	Std-Dev-Tra	Off
Accel. factor PE	2	Std-Dev-Time	Off
Ref. lines PE	24	MIP-Sag	Off
Accel. factor 3D	1	MIP-Cor	Off
Reference scan mode	Integrated	MIP-Tra	Off
		····· MIP-Time	Off
Image Filter	Off	Save original images	On

004	
Introduction	Off
Dimension	3D
Elliptical scanning	Off
Reordering	Linear
Asymmetric echo	Weak
Contrasts	2
Bandwidth 1	854 Hz/Px
Bandwidth 2	854 Hz/Px
Flow comp. 1	No
Flow comp. 2	No
Readout mode	Monopolar
Optimization	None
Allowed delay	0 s
Echo spacing	6.8 ms
Sequence type	Gre
Define	Shots
Shots per slice	1
RF pulse type	Fast
Gradient mode	Fast
Excitation	Non-sel.
Flip angle mode	Constant
RF spoiling	On
Phase Enc. Rewinder	On

\\USER\Re	esearch\19028_KGarner\l	Protocols v1 17072019\AAHSco	ut_32ch 220V
TA: 0:17 PA	AT: 3 Voxel size: 1.6×1.6:	×1.6 mm Rel. SNR: 1.00 SIE	MENS: AALScout
roportios		Elliptical filter	Off
roperties Prio Recon	Off	Geometry	
Before measurement	Oli	Multi-slice mode	Sequential
After measurement		Series	Ascending
Load to viewer	On		· · · · · · · · · · · · · · · · · · ·
Inline movie	Off	Table position	H
Auto store images	On	Table position	0 mm
Load to stamp segments	On	Inline Composing	Off
Load images to graphic	On	System	
segments		V32	Off
Auto open inline display	Off	A32	On
Start measurement without	On	Desirient	DEE
further preparation		Positioning mode	REF
Wait for user to start	Off	MSMA	S-C-T
Start measurements	single	Sagittal	R >> L
outine		Coronal	A >> P
Slab group 1		Transversal	F >> H
Slabs	1	Save uncombined	Off
Dist. factor	20 %	Coil Combine Mode	Adaptive Combine
Position	L0.0 A24.1 F32.1	Auto Coil Select	Off
Orientation	Sagittal	Shim mode	Standard
Phase enc. dir.	A >> P	Adjust with body coil	Off
Rotation	0 deg	Confirm freq. adjustment	Off
AutoAlign	Head	Assume Silicone	Off
Phase oversampling	0 %	! Ref. amplitude 1H	240.000 V
Slice oversampling	0.0 %	Adjustment Tolerance	Auto
Slices per slab	128	Adjust volume	
FoV read	260 mm	Position	L0.0 A24.1 F32.1
FoV phase	100.0 %	Orientation	Sagittal
Slice thickness	1.6 mm	Rotation	0.00 deg
TR	4.00 ms	F >> H	260 mm
TE	1.53 ms	A >> P	260 mm
Averages	1	R >> L	205 mm
Concatenations	1	Inline	
Filter	B1 filter		7.4.0
Coil elements	A32	Time to center	7.4 s
	-	MapIt	None
ontrast Flip angle	16.0 deg	Contrasts	1
Flip angle	16.0 deg	Sequence	
Averaging mode	Short term	Introduction	On
Reconstruction	Magnitude	Dimension	3D
Measurements	1	Asymmetric echo	Weak
esolution		Bandwidth	550 Hz/Px

Auto store images Load to stamp segments	On On	Table position Inline Composing	0 mm Off
Load images to graphic	On	System	
segments		V32	Off
Auto open inline display	Off	A32	On
Start measurement without	On	Positioning mode	REF
further preparation		MSMA	S-C-T
Wait for user to start	Off	Sagittal	R >> L
Start measurements	single	Coronal	A >> P
Routine		Transversal	F >> H
Slab group 1	_	Save uncombined	Off
Slabs	1	Coil Combine Mode	Adaptive Combine
Dist. factor	20 %	Auto Coil Select	Off
Position	L0.0 A24.1 F32.1		
Orientation	Sagittal	Shim mode	Standard
Phase enc. dir.	A >> P	Adjust with body coil	Off
Rotation	0 deg	Confirm freq. adjustment	Off
AutoAlign	Head	Assume Silicone	Off
Phase oversampling	0 %	! Ref. amplitude 1H	240.000 V
Slice oversampling	0.0 %	Adjustment Tolerance	Auto
Slices per slab	128	Adjust volume	
FoV read	260 mm	Position	L0.0 A24.1 F32.1
FoV phase	100.0 %	Orientation	Sagittal
Slice thickness	1.6 mm	Rotation	0.00 deg
TR	4.00 ms	F >> H	260 mm
TE TE	1.53 ms	A >> P	260 mm
Averages	1	R >> L	205 mm
Concatenations	1	I India a	
Odribatoriations	· ·	Inline	
Filtor	R1 filtor		_ ,
Filter Coil elements	B1 filter A32	Time to center	7.4 s
Coil elements	B1 filter A32		7.4 s None
Coil elements Contrast	A32	Time to center MapIt Contrasts	
Coil elements		MapIt Contrasts	None
Coil elements Contrast Flip angle	A32	MapIt Contrasts Sequence	None 1
Coil elements Contrast Flip angle Averaging mode	A32 16.0 deg Short term	MapIt Contrasts Sequence Introduction	None 1
Coil elements Contrast Flip angle Averaging mode Reconstruction	A32	MapIt Contrasts Sequence Introduction Dimension	None 1 On 3D
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements	A32 16.0 deg Short term Magnitude	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo	None 1 On 3D Weak
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution	A32 16.0 deg Short term Magnitude 1	MapIt Contrasts Sequence Introduction Dimension	None 1 On 3D
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution	A32 16.0 deg Short term Magnitude 1	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo	None 1 On 3D Weak
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution	A32 16.0 deg Short term Magnitude 1 160 100 %	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth	None 1 On 3D Weak 550 Hz/Px
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution	A32 16.0 deg Short term Magnitude 1 160 100 % 69 %	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type	None 1 On 3D Weak 550 Hz/Px
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution	A32 16.0 deg Short term Magnitude 1 160 100 % 69 %	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 6/8 GRAPPA	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 GRAPPA 3	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier PAT mode Accel. factor PE Ref. lines PE	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 6/8 GRAPPA 3 24	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier PAT mode Accel. factor PE Ref. lines PE Accel. factor 3D	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 6/8 GRAPPA 3 24 1	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier PAT mode Accel. factor PE Ref. lines PE Accel. factor 3D Reference scan mode	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 GRAPPA 3 24 1 Integrated	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier PAT mode Accel. factor PE Ref. lines PE Accel. factor 3D Reference scan mode Image Filter	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 GRAPPA 3 24 1 Integrated Off	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier PAT mode Accel. factor PE Ref. lines PE Accel. factor 3D Reference scan mode Image Filter Distortion Corr.	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 GRAPPA 3 24 1 Integrated Off Off	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier PAT mode Accel. factor PE Ref. lines PE Accel. factor 3D Reference scan mode Image Filter Distortion Corr. Prescan Normalize	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 GRAPPA 3 24 1 Integrated Off Off Off	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier PAT mode Accel. factor PE Ref. lines PE Accel. factor 3D Reference scan mode Image Filter Distortion Corr. Prescan Normalize Normalize	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 GRAPPA 3 24 1 Integrated Off Off Off Off	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier PAT mode Accel. factor PE Ref. lines PE Accel. factor 3D Reference scan mode Image Filter Distortion Corr. Prescan Normalize Normalize B1 filter	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 GRAPPA 3 24 1 Integrated Off Off Off Off Off On	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier PAT mode Accel. factor PE Ref. lines PE Accel. factor 3D Reference scan mode Image Filter Distortion Corr. Prescan Normalize Normalize B1 filter Intensity	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 GRAPPA 3 24 1 Integrated Off Off Off Off Off On Strong	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.
Coil elements Contrast Flip angle Averaging mode Reconstruction Measurements Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice partial Fourier PAT mode Accel. factor PE Ref. lines PE Accel. factor 3D Reference scan mode Image Filter Distortion Corr. Prescan Normalize Normalize B1 filter	A32 16.0 deg Short term Magnitude 1 160 100 % 69 % 6/8 6/8 GRAPPA 3 24 1 Integrated Off Off Off Off Off On	MapIt Contrasts Sequence Introduction Dimension Asymmetric echo Bandwidth RF pulse type Gradient mode Excitation	None 1 On 3D Weak 550 Hz/Px Fast Normal Non-sel.

\\USER\Research\19028_KGarner\Protocols v1 17072019\WIP944_mp2rage_0.75iso_7T

TA: 6:54 PAT: 3	Voxel size: 0.8×0.8×0.8 mm	Rel. SNR: 1.00 US	SER: tfl_wip944_b17stx
		Distortion Corr.	On
Properties		Mode	3D
Prio Recon	Off	Unfiltered images	On
Before measurement		Prescan Normalize	Off
After measurement	_	Normalize	Off
Load to viewer	On	B1 filter	Off
Inline movie	Off	Raw filter	Off
Auto store images	On	Elliptical filter	Off
Load to stamp segments	Off	•	5
Load images to graphic	Off	Geometry	
segments		Multi-slice mode	Single shot
Auto open inline display	Off	Series	Interleaved
Start measurement without	On		
further preparation		Table position	Н
Wait for user to start	Off	Table position	0 mm
Start measurements	single	Inline Composing	Off
Routine	•	System	
Slab group 1		V32	Off
Slabs	1	A32	On
Dist. factor	50 %		OII
Position	R0.1 A4.2 H1.9	Positioning mode	FIX
Orientation	Sagittal	MSMA	S - C - T
Phase enc. dir.	A >> P	Sagittal	R >> L
Rotation	19.23 deg	Coronal	A >> P
Phase oversampling	0 %	Transversal	F >> H
Slice oversampling	0.0 %	Save uncombined	Off
Slices per slab	256	Coil Combine Mode	Adaptive Combine
FoV read	240 mm	AutoAlign	Head > Basis
FoV phase	93.8 %	Auto Coil Select	Default
Slice thickness	0.75 mm		
TR	4300 ms	Shim mode	Standard
TE	3.38 ms	Adjust with body coil	Off
Averages	1	Confirm freq. adjustmen	
Concatenations	1	Assume Silicone	Off
Filter	Distortion Corr (3D)	? Ref. amplitude 1H	0.000 V
Coil elements	Distortion Corr.(3D) A32	Adjustment Tolerance	Auto
Con elements	A32	Adjust volume	
Contrast		Position	R0.1 A4.2 H1.9
Magn. preparation	Non-sel. IR	Orientation	Sagittal
TI 1	840 ms	Rotation	19.23 deg
TI 2	2370 ms	F >> H	240 mm
Flip angle 1	5 deg	A >> P	225 mm
Flip angle 2	6 deg	R >> L	192 mm
Fat suppr.	Water excit. normal	Physio	
Water suppr.	None	1st Signal/Mode	None
2nd Inversion Contrast	On		
Averaging mode	Long term	Dark blood	Off
Averaging mode Reconstruction	Long term	Resp. control	Off
Measurements	Magnitude		OII
Multiple series	Each measurement	Composing	
Multiple Selles	Lacifileasurement	Sequence	
Resolution		Introduction	On
Base resolution	320	Dimension	3D
Phase resolution	100 %	Elliptical scanning	Off
Slice resolution	100 %	Asymmetric echo	Off
Phase partial Fourier	6/8	Contrasts	011 1
Slice partial Fourier	6/8	Contrasts Bandwidth	1 250 Hz/Px
	OD A DD A		
PAT mode	GRAPPA	Flow comp.	No
Accel. factor PE	3	Echo spacing	7.7 ms
Ref. lines PE	32	RF pulse type	Fast
Accel. factor 3D	1	Gradient mode	Fast
Reference scan mode	Integrated	Excitation	Non-sel.
Image Filter	Off	RF spoiling	On
1	~··		

150 %
Off
On
850
On
Off
On
Off
60
Off

\\USER\Research\19028_KGarner\Protocols v1 17072019\cmrr_3x4_TR1.5s_1.5mm
TA: 4:48 PAT: 3 Voxel size: 1.5×1.5×1.5 mm Rel. SNR: 1.00 USER: cmrr_mbep2d_bold

Properties		Special sat.	None
Prio Recon	Off	Table position	Н
Before measurement	Oil	Table position Table position	H 0 mm
After measurement		Inline Composing	Off
Load to viewer	On	I mime composing	Oii
Inline movie	Off	System	
Auto store images	On	V32	Off
Load to stamp segments	Off	A32	On
Load images to graphic	Off	Positioning mode	FIX
segments		MSMA	S - C - T
Auto open inline display	Off	Sagittal	R >> L
Start measurement without	On	Coronal	A >> P
further preparation		Transversal	F >> H
Wait for user to start	On	Coil Combine Mode	Sum of Squares
Start measurements	single	AutoAlign	
Routine		Auto Coil Select	Default
Slice group 1		Shim mode	Standard
Slices	81	Adjust with body coil	Off
Dist. factor	0 %	Confirm freq. adjustment	Off
Position	L1.2 A18.3 H10.5	Assume Silicone	Off
Orientation	T > C-7.0 > S1.3	? Ref. amplitude 1H	0.000 V
Phase enc. dir.	A >> P	Adjustment Tolerance	Auto
Rotation	-0.60 deg	Adjust volume	
Phase oversampling	0 %	Position	L1.2 A18.3 H10.5
FoV read	192 mm	Orientation	T > C-7.0 > S1.3
FoV phase	100.0 %	Rotation	-0.60 deg
Slice thickness	1.50 mm	R >> L	192 mm
TR	1510 ms	A >> P	192 mm
TE	19.4 ms	F >> H	122 mm
Multi-band accel. factor	3	Physio	
Filter	None	1st Signal/Mode	None
Coil elements	A32	Tot Olgital/Woodo	140110
ı		BOI D	
Contrast		BOLD CLM Statistics	Off
Contrast MTC	Off	GLM Statistics	Off Off
Contrast MTC Magn. preparation	Off None	GLM Statistics Dynamic t-maps	Off
Contrast MTC Magn. preparation Flip angle	Off None 60 deg	GLM Statistics Dynamic t-maps Starting ignore meas	Off 0
Contrast MTC Magn. preparation	Off None	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition	Off 0 0
Contrast MTC Magn. preparation Flip angle Fat suppr.	Off None 60 deg Fat sat.	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states	Off 0 0 On
Contrast MTC Magn. preparation Flip angle	Off None 60 deg Fat sat. Long term	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter	Off 0 0 On On
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode	Off None 60 deg Fat sat.	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold	Off 0 0 On
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size	Off 0 0 On On 4.00 20
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements	Off None 60 deg Fat sat. Long term Magnitude 170	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold	Off 0 0 On On 4.00
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1]	Off 0 0 On On 4.00 20 Baseline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2]	Off 0 0 On On 4.00 20 Baseline Baseline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3]	Off 0 0 0 On On 4.00 20 Baseline Baseline Baseline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase resolution	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4]	Off 0 0 0 On On 4.00 20 Baseline Baseline Baseline Baseline Baseline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase partial Fourier	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5]	Off 0 0 0 On On 4.00 20 Baseline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase partial Fourier Interpolation	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8]	Off 0 0 0 On On 4.00 20 Baseline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase partial Fourier Interpolation PAT mode	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9]	Off 0 0 0 On On 4.00 20 Baseline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[7] Meas[8] Meas[9] Meas[10]	Off 0 0 0 On On 4.00 20 Baseline
MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3 36	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11]	Off 0 0 0 On On 4.00 20 Baseline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[11]	Off 0 0 On On A.00 20 Baseline Active Active
MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3 36 Segmented	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[11] Meas[12] Meas[12]	Off 0 0 0 On On 4.00 20 Baseline Active Active Active
MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3 36 Segmented Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[12] Meas[13] Meas[13]	Off 0 0 0 On On 4.00 20 Baseline Bateline Baseline Bateline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr.	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3 36 Segmented	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[11] Meas[12] Meas[13] Meas[14] Meas[14]	Off 0 0 0 On On 4.00 20 Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Bateline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize Raw filter	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3 36 Segmented Off Off Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[15] Meas[15]	Off 0 0 0 On On 4.00 20 Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Bateline
Contrast MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3 36 Segmented Off Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[10] Meas[11] Meas[12] Meas[12] Meas[13] Meas[14] Meas[15] Meas[15] Meas[15] Meas[16] Meas[17]	Off 0 0 0 On On A.00 20 Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Bateline
MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize Raw filter Elliptical filter Hamming	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3 36 Segmented Off Off On Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[10] Meas[11] Meas[12] Meas[12] Meas[13] Meas[14] Meas[15] Meas[15] Meas[15] Meas[16] Meas[17] Meas[17]	Off 0 0 0 On On A.00 20 Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Bateline
MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize Raw filter Elliptical filter Hamming Geometry	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3 36 Segmented Off Off On Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[15] Meas[15] Meas[16] Meas[17] Meas[17] Meas[18] Meas[18]	Off 0 0 0 On On 4.00 20 Baseline Active
MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize Raw filter Elliptical filter Hamming Geometry Multi-slice mode	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3 36 Segmented Off Off Off On Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[15] Meas[16] Meas[16] Meas[17] Meas[16] Meas[17] Meas[18] Meas[19] Meas[19]	Off 0 0 0 On On A.00 20 Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active
MTC Magn. preparation Flip angle Fat suppr. Averaging mode Reconstruction Measurements Delay in TR Multiple series Resolution Base resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize Raw filter Elliptical filter Hamming Geometry	Off None 60 deg Fat sat. Long term Magnitude 170 0 ms Off 128 100 % 6/8 Off GRAPPA 3 36 Segmented Off Off On Off	GLM Statistics Dynamic t-maps Starting ignore meas Ignore after transition Model transition states Temp. highpass filter Threshold Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[15] Meas[15] Meas[16] Meas[17] Meas[17] Meas[18] Meas[18]	Off 0 0 0 On On 4.00 20 Baseline Active

Introduction	On
Contrasts	1
Bandwidth	1116 Hz/Px
Flow comp.	No
Free echo spacing	Off
Echo spacing	1.02 ms
EPI factor	128
Gradient mode	Fast*
RF spoiling	Off
Excite pulse duration	7000 us
Single-band images	On
MB LeakBlock kernel	Off
MB dual kernel	Off
MB RF phase scramble	On
SENSE1 coil combine	On
Invert RO/PE polarity	Off
PF omits higher k-space	Off
Force equal slice timing	Off
Online multi-band recon.	Online
FFT scale factor	0.50
Physio recording	Off
Triggering scheme	Standard

\\USER\Res	search\19	0028_KGarner\Protocols v1	17072019\WIP_3	BDEPI_1080_1.5mm_TR1.9s
TA: 0:51	PAT: 6	Voxel size: 1.5×1.5×1.5 mm	Rel. SNR: 1.00	USER: ep3d_bold_WIP1080

Properties		Elliptical filter Hamming	Off Off
Prio Recon	Off	1	O.I.
Before measurement		Geometry	
After measurement		Multi-slice mode	Interleaved
Load to viewer	On	Series	Interleaved
Inline movie	Off	Special sat.	None
Auto store images	On	Special Sat.	
Load to stamp segments	Off	Table position	Н
Load images to graphic	Off	Table position	0 mm
segments		Inline Composing	Off
Auto open inline display	Off	1	
Start measurement without	On	System	
further preparation		V32	Off
Wait for user to start	Off	A32	On
Start measurements	single	Positioning mode	FIX
Б. ::	G	MSMA	S - C - T
Routine		Sagittal	R >> L
Slab group 1		Coronal	A >> P
Slabs	1	Transversal	F >> H
Dist. factor	50 %		
Position	R5.1 A25.4 F35.6	Coil Combine Mode	Sum of Squares
Orientation	Transversal	AutoAlign	D-f!t
Phase enc. dir.	A >> P	Auto Coil Select	Default
Rotation	0.00 deg	Shim mode	Standard
Phase oversampling	0 %	Adjust with body coil	Off
Slice oversampling	20.0 %	Confirm freq. adjustment	Off
Slices per slab	80	Assume Silicone	Off
FoV read	192 mm	? Ref. amplitude 1H	0.000 V
FoV phase	100.0 %	Adjustment Tolerance	Auto
Slice thickness	1.50 mm	Adjust volume	Adio
TR	60 ms	Position	R5.1 A25.4 F35.6
TE	22 ms	Orientation	Transversal
Averages	1		
Concatenations	1	Rotation	0.00 deg
Filter	None	R >> L	192 mm
Coil elements	A32	A >> P	192 mm
I	7.02	F >> H	120 mm
Contrast		Physio	
MTC	Off	1st Signal/Mode	None
Flip angle	15 deg	1	
Fat suppr.	Water excit. normal	BOLD	
Averaging mode	Long torm	···· Motion correction	Off
Averaging mode	Long term	Spatial filter	Off
Reconstruction	Magnitude	Sequence	
Measurements	20	Introduction	Off
Delay in TR	0 ms	Dimension	3D
Multiple series	Off		
Resolution		Reordering Contrasts	Linear 1
Base resolution	128	Bandwidth	ı 1116 Hz/Px
Phase resolution	100 %		Off
Slice resolution	100 %	Free echo spacing Echo spacing	Oπ 1.02 ms
Phase partial Fourier	6/8	Ecro spacing	1.02 1115
Slice partial Fourier	Off	EPI factor	128
Interpolation	Off	RF pulse type	Normal
		Gradient mode	Fast
PAT mode	GRAPPA	Excitation	Slab-sel.
Accel. factor PE	2	RF spoiling	On
Ref. lines PE	32	g	J11
Accel. factor 3D	3	Use Ernst angle?	On
Ref. lines 3D	24	Log physio?	Off
Reference scan mode	Separate	FFT scale	1.00
		···· RF BWTP	25.0
Distortion Corr.	Off	bipolar water excite?	Off
Prescan Normalize	Off	EFFECTIVE TR	1920 ms
Raw filter	On	PatPartitions	32
		1	

EPI phase correction local PAT refscan mode Flash FlashRef BaseRes 128 1000 Hz/px 4800 us FlashRef BW FlashRef TE 5 deg FlashRef FA use CAIPI On CAIPI shift kz 1 CAIPI shift ky 0 dummy prepscan time 3 s

Properties		Special sat.	None
Prio Recon	Off	Table position	 Н
Before measurement		Table position	0 mm
After measurement		Inline Composing	Off
Load to viewer	On	Inline Composing	Oli
Inline movie	Off	System	
Auto store images	On	V32	Off
Load to stamp segments	Off	A32	On
Load images to graphic	Off		
segments		Positioning mode	FIX
Auto open inline display	Off	MSMA	S - C - T
Start measurement without	On	Sagittal	R >> L
further preparation		Coronal	A >> P
Wait for user to start	On	Transversal	F >> H
Start measurements	single	Coil Combine Mode	Sum of Squares
Gtart measurements	Sirigie	AutoAlign	·
Routine		Auto Coil Select	Default
Slice group 1			
Slices	48	Shim mode	Standard
Dist. factor	0 %	Adjust with body coil	Off
Position	L1.4 A19.3 H2.4	Confirm freq. adjustment	Off
Orientation	T > C-7.0 > S1.3	Assume Silicone	Off
Phase enc. dir.	A >> P	? Ref. amplitude 1H	0.000 V
Rotation	-0.60 deg	Adjustment Tolerance	Auto
Phase oversampling	0 %	Adjust volume	
FoV read		Position	L1.4 A19.3 H2.4
	192 mm	Orientation	T > C-7.0 > S1.3
FoV phase	100.0 %	Rotation	-0.60 deg
Slice thickness	2.00 mm	R >> L	192 mm
TR	700 ms	A >> P	192 mm
TE 1	10.00 ms	F >> H	
TE 2	30.56 ms	г>>п	96 mm
Multi-band accel. factor	4	Physio	
Filter	None	1st Signal/Mode	None
Coil elements	A32	1	
Contrast		BOLD	
MTC	Off	GLM Statistics	Off
	None	Dynamic t-maps	Off
Magn. preparation		Starting ignore meas	0
Flip angle	35 deg	Ignore after transition	0
Fat suppr.	Fat sat.	Model transition states	On
Averaging mode	Long term	Temp. highpass filter	On
Reconstruction	Magnitude	Threshold	4.00
Measurements	581	Paradigm size	20
Delay in TR	0 ms	Meas[1]	Baseline
Multiple series	Off	Meas[2]	Baseline
•	Oil	Meas[3]	Baseline
Resolution		Meas[4]	Baseline
Base resolution	96	Meas[5]	Baseline
Phase resolution	100 %	Meas[6]	Baseline
Phase partial Fourier	5/8	Meas[7]	Baseline
Interpolation	Off		Baseline
		Meas[8]	Baseline
PAT mode	GRAPPA	Meas[9]	
Accel. factor PE	2	Meas[10]	Baseline
Ref. lines PE	24	Meas[11]	Active
Reference scan mode	GRE	Meas[12]	Active
		Meas[13]	Active
Distortion Corr.	Off	Meas[14]	Active
Prescan Normalize	Off	Meas[15]	Active
Raw filter	On	Meas[16]	Active
Elliptical filter	Off	Meas[17]	Active
Hamming	Off	Meas[18]	Active
•		Meas[19]	Active
Geometry		— Meas[20]	Active
Geometry Multi-slice mode Series	Interleaved Ascending	Meas[20]Motion correction	Active Off

Spatial filter	Off				
Sequence					
Introduction Contrasts	On 2				
Bandwidth	1930 Hz/Px				
Flow comp.	No				
Free echo spacing	Off				
Echo spacing	0.64 ms				
EPI factor	96				
Gradient mode	Fast				
RF spoiling	Off				
Excite pulse duration	4100 us				
Inter-TE delay	0 us				
Single-band images	On				
MB LeakBlock kernel	Off				
MB dual kernel	Off				
MB RF phase scramble	On				
SENSE1 coil combine	On				
Invert RO/PE polarity	Off				
PF omits higher k-space	Off				
Force equal slice timing	Off				
Online multi-band recon.	Online				
FFT scale factor	0.50				
GRE iPAT ref. FA	12.0 deg				
Physio recording	Off				
Triggering scheme	Standard				

\\USER\Research\19028_KGarner\Protocols v1 17072019\WIP_Diffusion_511E_1p8_b0_P-A
TA: 0:41 PAT: 3 Voxel size: 1.8×1.8×1.8 mm Rel. SNR: 1.00 USER: ep2d_advdiff_511E

Properties		Multi-slice mode	Interleaved
Prio Recon	Off	Series	Interleaved
Before measurement		Special sat.	None
After measurement			
Load to viewer	On	Table position	H
Inline movie	Off	Table position	0 mm
Auto store images	On	Inline Composing	Off
Load to stamp segments	Off	•	
Load images to graphic	Off	System	0"
segments		V32	Off
Auto open inline display	Off	A32	On
Start measurement without	On	Positioning mode	FIX
further preparation		MSMA	S - C - T
Wait for user to start	On	Sagittal	R >> L
Start measurements	single	Coronal	A >> P
Routine		Transversal	F >> H
Slice group 1		Coil Combine Mode	Adaptive Combine
Slices	70	AutoAlign	Head > Basis
Dist. factor	13 %	Auto Coil Select	Default
Position	L0.9 P12.0 H32.9	Shim mode	Standard
Orientation	T > C-18.1	Adjust with body coil	Standard Off
Phase enc. dir.	P >> A	Confirm freq. adjustment	Off
Rotation	173.16 deg	Assume Silicone	Off
Phase oversampling	0 %	? Ref. amplitude 1H	0.000 V
FoV read	216 mm	Adjustment Tolerance	Auto
FoV phase	100.0 %	Adjust volume	Auto
Slice thickness	1.8 mm	Position	L0.9 P12.0 H32.9
TR	6300 ms	Orientation	T > C-18.1
TE	63.6 ms	Rotation	173.16 deg
Averages	1	R >> L	216 mm
Concatenations	1	A >> P	216 mm
Filter	Raw filter	F >> H	143 mm
Coil elements	A32	<u>I</u>	
Contrast		Physio	N.
MTC	Off	1st Signal/Mode	None
Magn. preparation	None	PMU Recording	off
Fat suppr.	Fat sat.	Resp. control	Off
Extra Fat Suppr.	off	•	
Saturation Mode	standard	Diff	
		Diffusion mode	Free
Averaging mode	Long term	Diff. weightings b-value	1 0 s/mm²
Reconstruction	Magnitude	Diff. weighted images	O s/mm² On
Delay in TR	0 ms	Trace weighted images	Off
Multiple series	Off	Average ADC maps	Off
Resolution		Individual ADC maps	Off
Base resolution	120	FA maps	Off
Phase resolution	100 %	Mosaic	On
Phase partial Fourier	6/8	Tensor	Off
Interpolation	Off	Noise level	40
PAT mode	GRAPPA	Diff. directions	32
Accel, factor PE	3		
Ref. lines PE	72	Sequence	
Reference Scan Mode	FLASH	Introduction	Off
		Bandwidth	2084 Hz/Px
Distortion Corr.	Off	Optimization	None
Prescan Normalize	Off	Free echo spacing	Off
Raw filter	On	Echo spacing	0.64 ms
Intensity	Weak		
Slope	25	EPI factor	120
Elliptical filter	Off	RF pulse type	Normal
Hamming	Off	Gradient mode	Fast*
Geometry		Add. FFT Scale Factor	0.9
·		. I 14/ +	

\\USER\Research\19028_KGarner\Protocols v1 17072019\WIP_Diffusion_511E_1p8_b2500_64dir TA: 7:18 PAT: 3 Voxel size: 1.8×1.8×1.8 mm Rel. SNR: 1.00 USER: ep2d_advdiff_511E

Properties		Multi-slice mode Series	Interleaved Interleaved
Prio Recon	Off	- Series	·····
Before measurement		Special sat.	None
After measurement			
Load to viewer	On	Table position	Н
Inline movie	Off	Table position	0 mm
Auto store images	On	Inline Composing	Off
Load to stamp segments	Off	System	
Load images to graphic	Off	V32	Off
segments	2"	A32	On
Auto open inline display	Off	A32	OII
Start measurement without	On	Positioning mode	FIX
further preparation		MSMA	S - C - T
Wait for user to start	On	Sagittal	R >> L
Start measurements	single	Coronal	A >> P
Routine		Transversal	F >> H
Slice group 1		Coil Combine Mode	Adaptive Combine
Slices	70	AutoAlign	Head > Basis
Dist. factor	13 %	Auto Coil Select	Default
Position	L0.9 P12.0 H32.9	Shim mode	Standard
Orientation	T > C-18.1	Adjust with body coil	Off
Phase enc. dir.	A >> P	Confirm freq. adjustment	Off
Rotation	0.00 deg	Assume Silicone	Off
Phase oversampling	0 %	? Ref. amplitude 1H	0.000 V
FoV read	216 mm	Adjustment Tolerance	Auto
FoV phase	100.0 %	Adjust volume	Adio
Slice thickness	1.8 mm	Position	L0.9 P12.0 H32.9
TR	6300 ms	Orientation	T > C-18.1
TE	63.6 ms	Rotation	0.00 deg
Averages	1	R >> L	216 mm
Concatenations	1	A >> P	216 mm
Filter	Raw filter	F >> H	143 mm
Coil elements	A32	Ţ	110 11111
Contrast		Physio	
MTC	Off	1st Signal/Mode	None
Magn. preparation	None	PMU Recording	off
Fat suppr.	Fat sat.	Resp. control	Off
Extra Fat Suppr.	off	•	
Saturation Mode	standard	Diff	
		Diffusion mode	Free
Averaging mode	Long term	Diff. weightings	1
Reconstruction	Magnitude	b-value	2500 s/mm²
Delay in TR	0 ms	Diff. weighted images	On
Multiple series	Off	Trace weighted images	On
Resolution		Average ADC maps	On
Base resolution	120	Individual ADC maps	On
Phase resolution	100 %	FA maps Mosaic	On On
Phase partial Fourier	6/8	Tensor	_
Interpolation	Off	Noise level	On 40
		Diff. directions	64
PAT mode	GRAPPA	Dill. directions	
Accel. factor PE	3	Sequence	
Ref. lines PE	72		O#
Reference Scan Mode	FLASH	Introduction	Off 2084 Hz/Px
Distortion Corr.	Off	Bandwidth	
Prescan Normalize	Off	Optimization Free echo spacing	None Off
Raw filter	On		_
Intensity	Weak	Echo spacing	0.64 ms
Slope	25	EPI factor	120
Elliptical filter	Off	RF pulse type	Normal
Hamming	Off	Gradient mode	Fast*
1			
Geometry		Add. FFT Scale Factor	0.9

\\USER\Research\19028_KGarner\Protocols v1 17072019\WIP_Diffusion_511E_1p8_b1000_32dir TA: 3:57 PAT: 3 Voxel size: 1.8×1.8×1.8 mm Rel. SNR: 1.00 USER: ep2d_advdiff_511E

Properties Properties	Off	Multi-slice mode Series	Interleaved Interleaved
Prio Recon Before measurement After measurement	Off	Special sat.	None
Load to viewer Inline movie Auto store images	On Off On	Table position Table position	H 0 mm
Load to stamp segments	Off	Inline Composing	Off
Load images to graphic	Off	System	0"
segments	0"	V32 A32	Off On
Auto open inline display Start measurement without	Off On		
further preparation	Oli	Positioning mode	FIX S - C - T
Wait for user to start	On	MSMA Sagittal	8 - C - 1 R >> L
Start measurements	single	Coronal	A >> P
Routine		Transversal	F >> H
Slice group 1		Coil Combine Mode	Adaptive Combine
Slices	70	AutoAlign	Head > Basis
Dist. factor	13 %	Auto Coil Select	Default
Position Orientation	L0.9 P12.0 H32.9 T > C-18.1	Shim mode	Standard
Phase enc. dir.	A >> P	Adjust with body coil	Off
Rotation	0.00 deg	Confirm freq. adjustment Assume Silicone	Off Off
Phase oversampling	0 %	? Ref. amplitude 1H	0.000 V
FoV read	216 mm	Adjustment Tolerance	Auto
FoV phase	100.0 %	Adjust volume	
Slice thickness TR	1.8 mm 6300 ms	Position	L0.9 P12.0 H32.9
TE	63.6 ms	Orientation	T > C-18.1
Averages	1	Rotation R >> L	0.00 deg 216 mm
Concatenations	1	A >> P	216 mm
Filter	Raw filter	F >> H	143 mm
Coil elements	A32	Physio	
Contrast		. 1st Signal/Mode	None
MTC	Off	PMU Recording	off
Magn. preparation	None Fat sat.	Resp. control	Off
Fat suppr. Extra Fat Suppr.	off	•	Oli
Saturation Mode	standard	Diff	
		Diffusion mode Diff. weightings	Free 1
Averaging mode Reconstruction	Long term Magnitude	b-value	1 1000 s/mm²
Delay in TR	0 ms	Diff. weighted images	On
Multiple series	Off	Trace weighted images	On
Resolution		Average ADC maps	On
Base resolution	120	Individual ADC maps	On
Phase resolution	100 %	FA maps Mosaic	On On
Phase partial Fourier	6/8	Tensor	On
Interpolation	Off	Noise level	40
PAT mode	GRAPPA	Diff. directions	32
Accel. factor PE	3	_	
Ref. lines PE	72	Sequence	0"
Reference Scan Mode	FLASH	Introduction Bandwidth	Off 2084 Hz/Px
Distortion Corr.	Off	Optimization	None
Prescan Normalize	Off	Free echo spacing	Off
Raw filter	On Week	Echo spacing	0.64 ms
Intensity Slope	Weak 25	EPI factor	120
Elliptical filter	Off	RF pulse type	Normal
Hamming	Off	Gradient mode	Fast*
Geometry		Add. FFT Scale Factor	0.9
		. 1	- -

\\USER\Research\19028_KGarner\Protocols v1 17072019\cmrr_3x3_TR1.9s_1.3mm
TA: 7:00 PAT: 3 Voxel size: 1.3×1.3×1.3 mm Rel. SNR: 1.00 USER: cmrr_mbep2d_bold

Properties		Special sat.	None
Prio Recon	Off	Table position	Н
Before measurement		Table position	0 mm
After measurement		Inline Composing	Off
Load to viewer	On		
Inline movie	Off	System	0#
Auto store images	On	V32	Off
Load to stamp segments	Off	A32	On
Load images to graphic	Off	Positioning mode	FIX
segments		MSMA	S - C - T
Auto open inline display	Off	Sagittal	R >> L
Start measurement without	On	Coronal	A >> P
further preparation		Transversal	F >> H
Wait for user to start	On	Coil Combine Mode	Sum of Squares
Start measurements	single	AutoAlign	
Routine		Auto Coil Select	Default
Slice group 1	_	Shim mode	Standard
Slices	96	Adjust with body coil	Off
Dist. factor	0 %	Confirm freq. adjustment	Off
Position	L1.4 A19.3 H2.4	Assume Silicone	Off
Orientation	T > C-7.0 > S1.3	? Ref. amplitude 1H	0.000 V
Phase enc. dir.	A >> P	Adjustment Tolerance	Auto
Rotation	-0.60 deg	Adjust volume	
Phase oversampling	0 %	Position	L1.4 A19.3 H2.4
FoV read	212 mm	Orientation	T > C-7.0 > S1.3
FoV phase	100.0 %	Rotation	-0.60 deg
Slice thickness	1.30 mm	R >> L	212 mm
TR	1990 ms	A >> P	212 mm
TE	25 ms	F >> H	125 mm
Multi-band accel. factor	3	Physio	
Filter	None	1st Signal/Mode	None
Coil elements	A32	1	None
Contrast	0#	BOLD GLM Statistics	Off
MTC Magn propagation	Off None	Dynamic t-maps	Off
Magn. preparation Flip angle	70 deg	Starting ignore meas	0
	•	Ignore after transition	0
Fat suppr.	Fat sat.	Model transition states	On
Averaging mode	Long term	Temp. highpass filter	On
Reconstruction	Magnitude	Threshold	4.00
Measurements	188	Paradigm size	20
Delay in TR	•		
	0 ms	Meas[1]	Baseline
Multiple series	0 ms Off	Meas[1] Meas[2]	Baseline Baseline
Resolution	Off	Meas[2]	Baseline
Resolution Base resolution	Off 164	Meas[2] Meas[3] Meas[4] Meas[5]	Baseline Baseline Baseline Baseline
Resolution Base resolution Phase resolution	Off 164 100 %	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6]	Baseline Baseline Baseline Baseline Baseline
Resolution Base resolution Phase resolution Phase partial Fourier	Off 164 100 % 7/8	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation	Off 164 100 % 7/8 Off	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode	Off 164 100 % 7/8 Off GRAPPA	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE	Off 164 100 % 7/8 Off GRAPPA 3	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10]	Baseline
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE	Off 164 100 % 7/8 Off GRAPPA 3 36	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11]	Baseline Active
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE	Off 164 100 % 7/8 Off GRAPPA 3	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode	Off 164 100 % 7/8 Off GRAPPA 3 36 GRE	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active Active
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr.	Off 164 100 % 7/8 Off GRAPPA 3 36 GRE	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active Active Active
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode	Off 164 100 % 7/8 Off GRAPPA 3 36 GRE	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active Active Active Active
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize Raw filter	Off 164 100 % 7/8 Off GRAPPA 3 36 GRE Off Off Off	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active Active Active Active Active Active Active
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize Raw filter Elliptical filter	Off 164 100 % 7/8 Off GRAPPA 3 36 GRE Off Off	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16] Meas[17]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize Raw filter Elliptical filter Hamming	Off 164 100 % 7/8 Off GRAPPA 3 36 GRE Off Off Off On Off	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16] Meas[17] Meas[18]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize Raw filter Elliptical filter Hamming Geometry	Off 164 100 % 7/8 Off GRAPPA 3 36 GRE Off Off Off On Off	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16] Meas[17] Meas[18] Meas[18]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active
Resolution Base resolution Phase resolution Phase partial Fourier Interpolation PAT mode Accel. factor PE Ref. lines PE Reference scan mode Distortion Corr. Prescan Normalize Raw filter Elliptical filter Hamming	Off 164 100 % 7/8 Off GRAPPA 3 36 GRE Off Off Off On Off	Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16] Meas[17] Meas[18]	Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active

1	
Introduction	On
Contrasts Bandwidth	1 1386 Hz/Px
Flow comp.	No
Free echo spacing	Off
Echo spacing	0.83 ms
EPI factor	164
Gradient mode	Fast
RF spoiling	Off
Excite pulse duration	7000 us
Single-band images	On
MB LeakBlock kernel	Off
MB dual kernel	Off
MB RF phase scramble	On
SENSE1 coil combine	Off
Invert RO/PE polarity	Off
PF omits higher k-space	Off
Force equal slice timing	Off
Online multi-band recon.	Online
FFT scale factor	0.50
GRE iPAT ref. FA	12.0 deg
Physio recording	Off
Triggering scheme	Standard