MS Journal Appendix for MRI methodology

Hardware		
Field strength	7T	
Manufacturer	Philips	
Model	Achieva	
Coil type (e.g. head, surface)	Head	
Number of coil channels	32	

Acquisition sequence			
Type (e.g. FLAIR, DIR, DTI, fMRI)	3D MPRAGE		
Acquisition time	2:12		
Orientation	Sagittal		
Alignment (e.g. anterior commissure/poster commissure line)	Whole brain coverage		
Voxel size	1.25 mm isotropic		
TR	2.8 ms		
TE	1.3 ms		
ТІ	1300 ms		
Flip angle	7 °		
NSA	1		
Field of view	256 x 256 x 172.5 mm ³	256 x 256 x 172.5 mm ³	
Matrix size	205 x 205 x 138		
Parallel imaging	Yes	No	
If used, parallel imaging method: (e.g. SENSE, GRAPPA)	SENSE, 2 AP, 2 RL	SENSE, 2 AP, 2 RL	
Cardiac gating	Yes	No	
If used, cardiac gating method: (e.g. PPU or ECG)			
Contrast enhancement	Yes	Νο	

Acquisition sequence	
If used, provide name of contrast agent, dose and timing of scan post-contrast administration	n/a
Other parameters:	Recon Matrix = 224 TFE factor = 256 TFE shot interval = 4500 ms Turbo direction = radial

Acquisition sequence		
Type (e.g. FLAIR, DIR, DTI, fMRI)	CEST (2D multi-shot turbo field echo)	
Acquisition time	11:37	
Orientation	Transverse	
Alignment (e.g. anterior commissure/poster commissure line)	Aligned with AC/PC line and shifted ~20 mm in head direction	
Voxel size	1.87 mm x 1.87 mm x 10 mm	
TR	5.6 ms	
TE	2.7 ms	
ТІ	n/a	
Flip angle	10°	
NSA	1	
Field of view	240 mm x 240 mm	
Matrix size	128 x 128 x 1	
Parallel imaging	Yes	No
If used, parallel imaging method: (e.g. SENSE, GRAPPA)	n/a	
Cardiac gating	Yes	Νο
If used, cardiac gating method: (e.g. PPU or ECG)	n/a	
Contrast enhancement	Yes	Νο
If used, provide name of contrast agent, dose and timing of scan post-contrast administration	n/a	
Other parameters:	Recon Matrix = 256 TFE factor = 3 TFE shot interval = 331 ms CEST saturation: $4.25 \ \mu$ T pulse train of 10 ms Gaussian pulses, 90% duty cycle, 100 ms total duration); 49 equally- spaced offset frequencies swept between $\Delta \omega$ =+/-5.0 ppm and one reference (S ₀ , $\Delta \omega$ =80.0 ppm)	

Image analysis methods and outputs			
Lesions			
Type (e.g. Gd-enhancing, T2-hyperintense, T1-hypointense)			
Analysis method			
Analysis software			
Output measure (e.g. count or volume [ml])			
Tissue volumes			
Type (e.g. whole brain, grey matter, white matter, spinal cord)			
Analysis method			
Analysis software			
Output measure (e.g. absolute tissue volume in ml, tissue volume as a fraction of intracranial volume, percentage change in tissue volumes)			
Tissue measures (e.g. MTR, DTI, T1-RT, T2-RT, T2*, T2', ¹ H-MRS, perfusion, Na)			
Type (e.g. whole brain, grey matter, white matter, spinal cord, normal-appearing grey matter or white matter)	Cortical gray matter		
Analysis method	CEST z-spectrum		
Analysis software	Matlab		
Output measure	GluCEST contrast (normalized CEST asymmetry at $\Delta \omega$ = 3.0 ppm)		
Other MRI measures (e.g. functional MRI)			
Type (e.g. whole brain, grey matter, white matter, spinal cord, normal-appearing grey matter or white matter)			
Analysis method			
Analysis software			
Output measure			

Other analysis details:

Tissue masks for GM, WM, and CSF were segmented in SPM12 from the MPRAGE volume using the Segment tool and registered to the CEST acquisition using FLIRT linear registration in FSL.