

MS Journal Appendix for MRI methodology

Hardware	
Field strength	3.0T
Manufacturer	Philips
Model	Achieva
Coil type (e.g. head, surface)	SENSE head coil
Number of coil channels	8

Acquisition sequence		
Type (e.g. FLAIR, DIR, DTI, fMRI)	Magnetic Resonance Spectroscopy with Point RESolved Spectroscopy (PRESS)	
Acquisition time	4 min 24 sec	
Orientation	Large supraventricular voxel	
Alignment (e.g. anterior commissure/poster commissure line)	See Fig 1	
Voxel size	$6.5 \times 4.5 \times 1.8 \text{ cm}^3$	
TR	4000 ms	
TE	36 ms	
TI	N/A	
Flip angle	90	
NEX	56	
Field of view	N/A	
Matrix size	N/A	
Parallel imaging	Yes	<input checked="" type="checkbox"/> No
If used, parallel imaging method: (e.g. SENSE, GRAPPA)		
Cardiac gating	Yes	<input checked="" type="checkbox"/> No
If used, cardiac gating method: (e.g. PPU or ECG)		
Contrast enhancement	Yes	<input checked="" type="checkbox"/> No

Acquisition sequence

If used, provide name of contrast agent, dose and timing of scan post-contrast administration

Other parameters:

8 phase cycle steps
56 water-suppressed acquisitions
8 non-water-suppressed acquisitions
Automated second order pencil-beam shimming

Image analysis methods and outputs	
Lesions	
Type (e.g. Gd-enhancing, T2-hyperintense, T1-hypointense)	Gd-enhancing
Analysis method	Manual identification
Analysis software	Automated in-house lesion growing algorithm
Output measure (e.g. count or volume [ml])	Voxel fraction of lesion % and mL
Tissue volumes	
Type (e.g. whole brain, grey matter, white matter, spinal cord)	Primarily white matter
Analysis method	Segmentation
Analysis software	Automated in-house segmentation
Output measure (e.g. absolute tissue volume in ml, tissue volume as a fraction of intracranial volume, percentage change in tissue volumes)	Voxel fractions of white matter, grey matter and CSF (%)
Tissue measures (e.g. MTR, DTI, T1-RT, T2-RT, T2*, T2', ¹H-MRS, perfusion, Na)	
Type (e.g. whole brain, grey matter, white matter, spinal cord, normal-appearing grey matter or white matter)	¹ H-MRS
Analysis method	Basis-set fitting
Analysis software	LCModel version 6.3 followed by in-house scaling calculation
Output measure	Absolute metabolite concentrations (mM) of: N-acetyl-aspartate (NAA) Total creatine (tCr) Total choline (tCho) Myo-inositol (mI) Glutamate (Glu) Glutamine (Gln)
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: none