

On-line Table 1: Volumetry software versions, parameters, and processing times

Software	SyMRI	FreeSurfer	FSL	SPM	LST	ITK-SNAP
Version	7.2 RC	5.3.0	5.0	12	1.2.3	3.2.0
Input sequences	syMRI sequence	MPRAGE	MPRAGE	MPRAGE	MPRAGE, FLAIR	Conventional 2D FLAIR, synthetic FLAIR
Parameters	None	All, MPRAGE, 3T	Lesion filled using LST; SIENAX, ^a B, f 0.2	Lesion filled using LST; VBM12, ^b default settings	κ value, 0.3; lesion belief map GM	–
Mean computational time per person and run (min) ^c	00:16	187:16	13:15	12:32	28:18	–
Mean editing time per person (min)	None	18	None ^d	None	3	65
Definition of the tissue types	–	BV = Brain Segmentation without Ventricles + Brain Stem; WM = Cortical WM + Right and Left Cerebellum WM; ICV = estimated total ICV	Non-normalized BV, WM, GM	–	–	–

Note:— FSL indicates FMRIB software library; SIENAX, structural image evaluation, using normalisation, of atrophy, cross-sectional; VBM, voxel-based morphometry; LST, Lesion Segmentation Toolbox.

^a <http://fsl.fmrib.ox.ac.uk/fsl/fslwiki/SIENAX>.

^b <http://fsl.fmrib.ox.ac.uk/fsl/fsl-4.1.9/fslvbm/index.html>.

^c All software was run in the Mac 64-bit version on a laptop (MacBook Pro, 3 GHz Intel Core i7, 8 GB DDR 3 RAM; Cupertino, California).

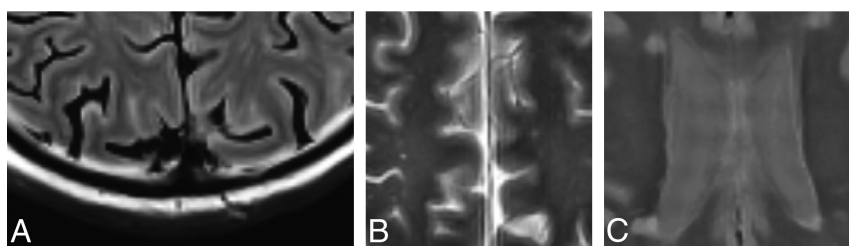
^d No manual editing, but multiple runs necessary to optimize parameters.

On-line Table 2: Repeatability of volumetric synthetic MRI measurements in patients with MS ($n = 20$) and controls ($n = 20$)^a

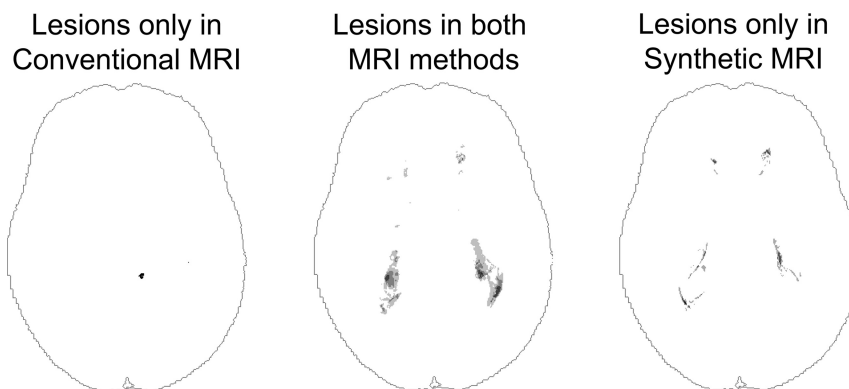
	Measurement 1 (mean) (SD)	Measurement 2 (mean) (SD)	Average Individual Difference	Average Relative Individual Difference	CoV
BV controls	1231 (148)	1232 (147)	0.5	0.02%	0.25%
BV patients	1149 (145)	1148 (143)	1.3	0.1%	0.35%
GMV controls	719 (91)	713 (94)	6.7	0.5%	1.6%
GMV patients	674 (74)	676 (69)	1.8	0.3%	1.2%
WMV controls	469 (74)	474 (72)	5.0	0.5%	2.0%
WMV patients	420 (105)	418 (105)	2.4	0.6%	1.6%
NONV controls	43 (23)	45 (29)	2.0	2.3%	12%
NONV patients	55 (22)	54.1 (20.4)	0.7	1.4%	6.5%
ICV controls	1439 (173)	1438 (173)	0.8	0.03%	0.24%
ICV patients	1433 (158)	1430 (158)	2.7	0.2%	0.28%
BPF controls	85.7 (4.3)	85.8 (4.2)	0.05	0.03%	0.21%
BPF patients	80.4 (6.6)	80.5 (6.4)	0.04	0.06%	0.25%
GMF controls	50.1 (3.4)	49.6 (3.6)	0.4	0.4%	1.6%
GMF patients	47.3 (4.7)	47.5 (4.5)	0.2	0.5%	1.2%
WMF controls	32.7 (3.8)	33.1 (3.8)	0.4	0.6%	2.1%
WMF patients	29.3 (5.9)	29.2 (6.0)	0.1	0.4%	1.7%
NONF controls	2.9 (1.3)	3.0 (1.6)	0.13	2.2%	11%
NONF patients	3.8 (1.5)	3.8 (1.3)	0.06	1.6%	6.1%

Note:—GMV indicates gray matter volume; NONV, non-WM/GM/CSF volume; NONF, non-WM/GM/CSF fraction; WMV, white matter volume.

^a Volumes are presented in milliliters, and tissue fractions, in percentages. Absolute average difference is given in milliliters for all tissue volumes and in percentage points for all tissue fractions.



ON-LINE FIG 1. Artifacts in synthetic MR imaging. A, Chemical-shift displacement artifacts posteriorly in a FLAIR image. B, Gibbs phenomenon along the midline structures in a T2WI. C, Sinusoidal intensity difference in the CSF in a PD-weighted image.



ON-LINE FIG 2. Distribution of differences in manual lesion segmentations in a 29-year-old female patient with MS with a lesion volume of 12.3 mL on conventional MR imaging and 12.7 mL on synthetic MR imaging. Images were obtained by using the longitudinal pipeline of the Lesion Segmentation Toolbox 2.0.9.²⁰