**Methods:** 19 patients with progressive multifocal leukoencephalopathy, multiple sclerosis or HIV WML were studied. One to four lesions were evaluated for each patient, for a total of 34 lesions. All patients were imaged with the same FLAIR sequence (TE=140, TR=10000, TI=2200, 5mm slice thickness). For 9 patients (17 lesions), repeat scans were acquired within 30 minutes with patient repositioning (Figure, top row).

The manual method consisted of outlining the edges of the lesions on all slices containing the lesions, using a mouse and dedicated software which allowed the operator to draw and edit polygonal lines on the magnified FLAIR images. The automatic method consisted, for each selected lesion, of the three-dimensional seed-and-explode algorithm presented with respect to patient orientation (Figure, bottom row), the automatic method proved much more reproducible than the manual method for larger lesions: for the 7 lesions with volume ≥ 5ml, the average and maximum relative volume differences were 9% and 16% for the manual method, and only 1.1% and 2.4% for the automatic method. We conclude that much care must be taken when attempting to quantify lesions smaller than 5ml on a digital computer, and that the automated method proved efficient at reducing quantification uncertainty due to scanning orientation.

**Acknowledgement:** Partially supported by NIDA (00280)

**REFERENCE:**
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