

Figure 1: Scanning protocol for the dual contrast injection study

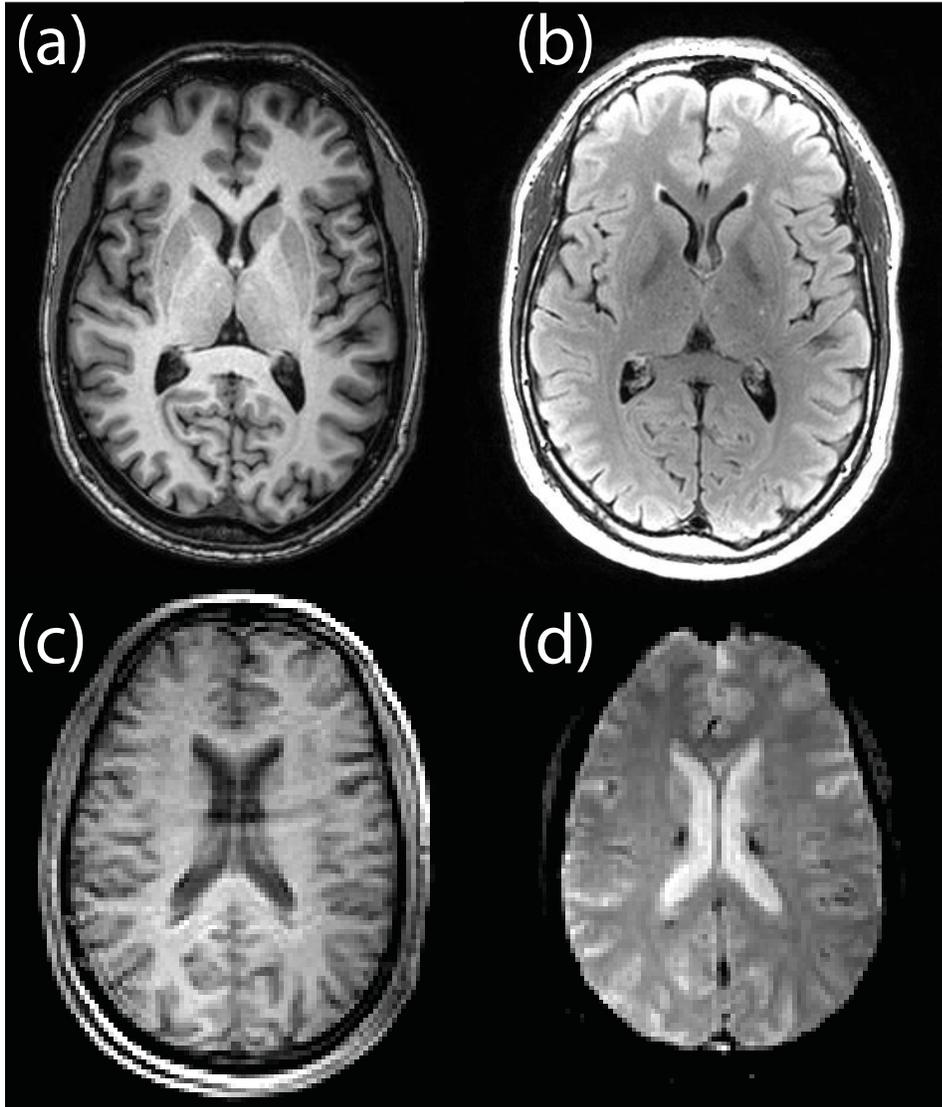


Figure 2: Example acquired images: (a) MPRAGE; (b) T2 FLAIR; (c) pre-contrast baseline DCE; (d) pre-contrast baseline DSC

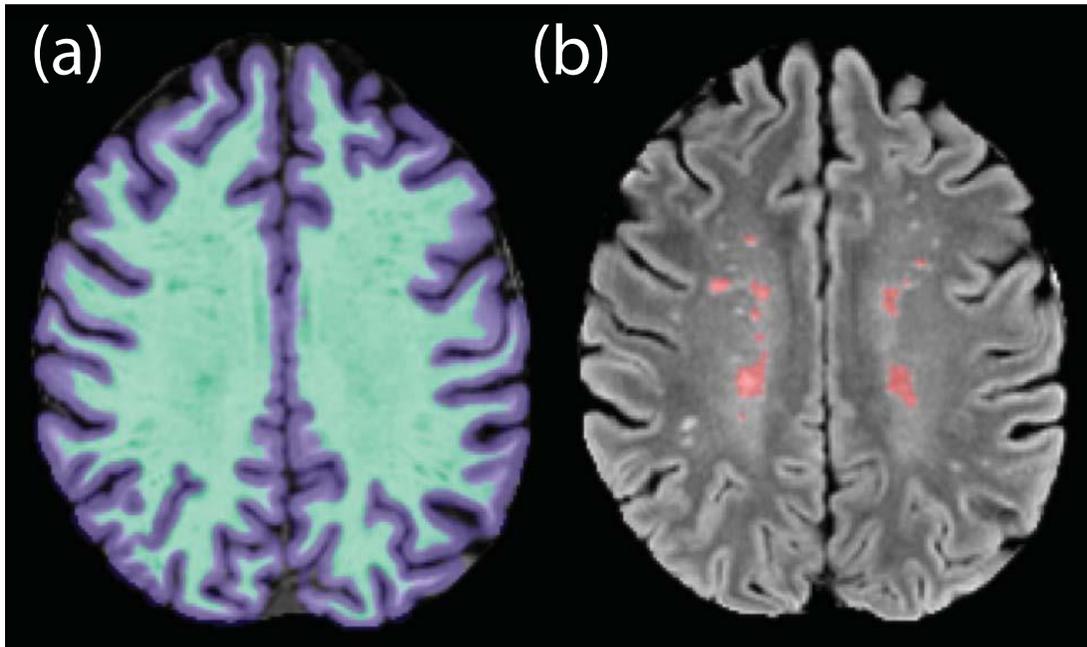


Figure 3: Example whole brain (left) and lesion (right) segmentations for a representative subject

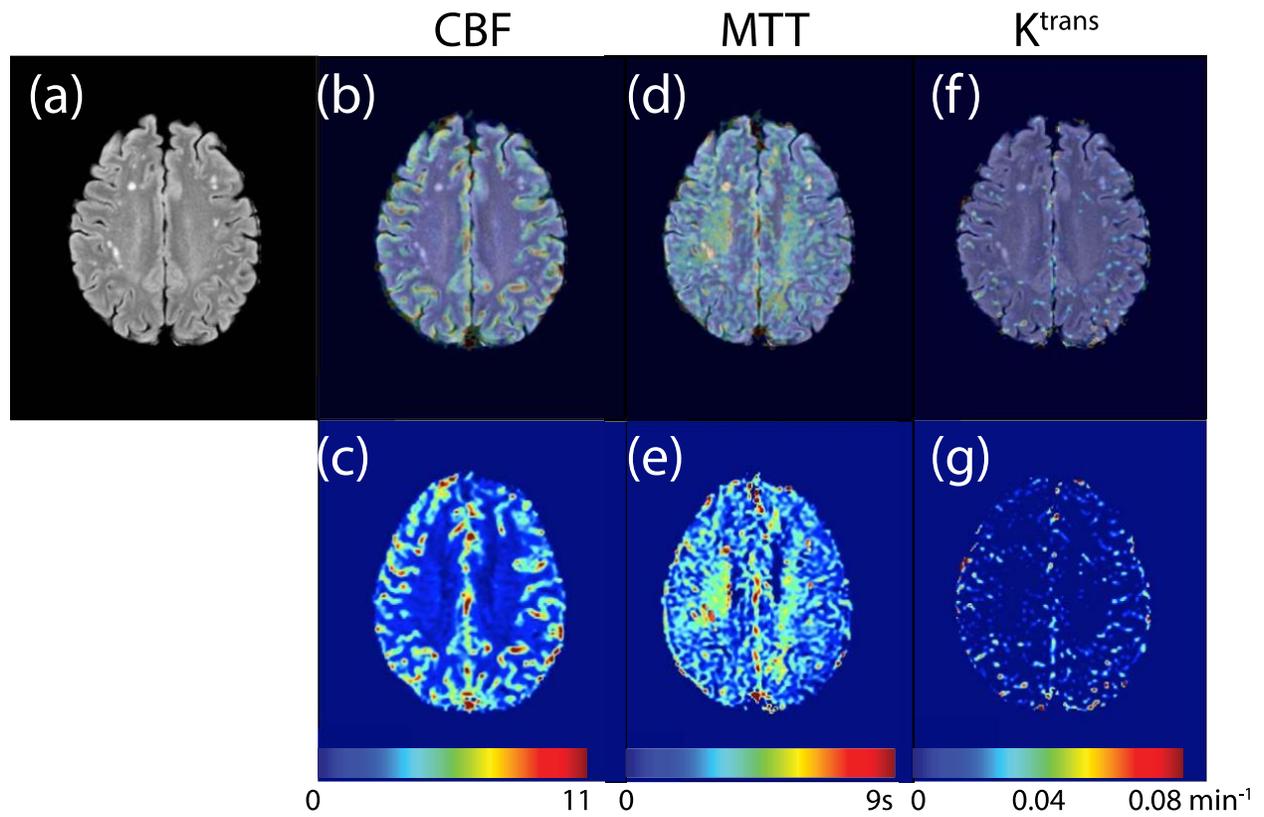


Figure 4: Representative slice of FLAIR (a), normalized CBF map (c), MTT map (e), and K^{trans} map (g) in a subject with mild lesion load. The maps (b, d, f) are also overlaid on FLAIR image showing co-localization.

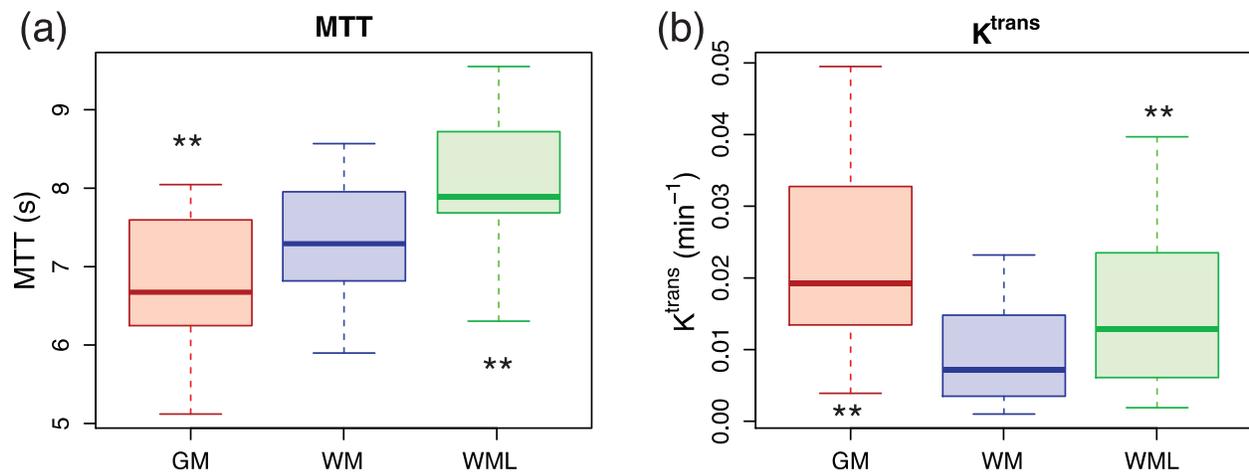


Figure 5: Median and IQR across subjects for (a) MTT, and (b) K^{trans} in WM, WML and GM (N=19). ** Denotes levels that are significant difference to the white matter ($p < 0.001$). Significance was calculated with a Wilcoxon Signed Rank Test.

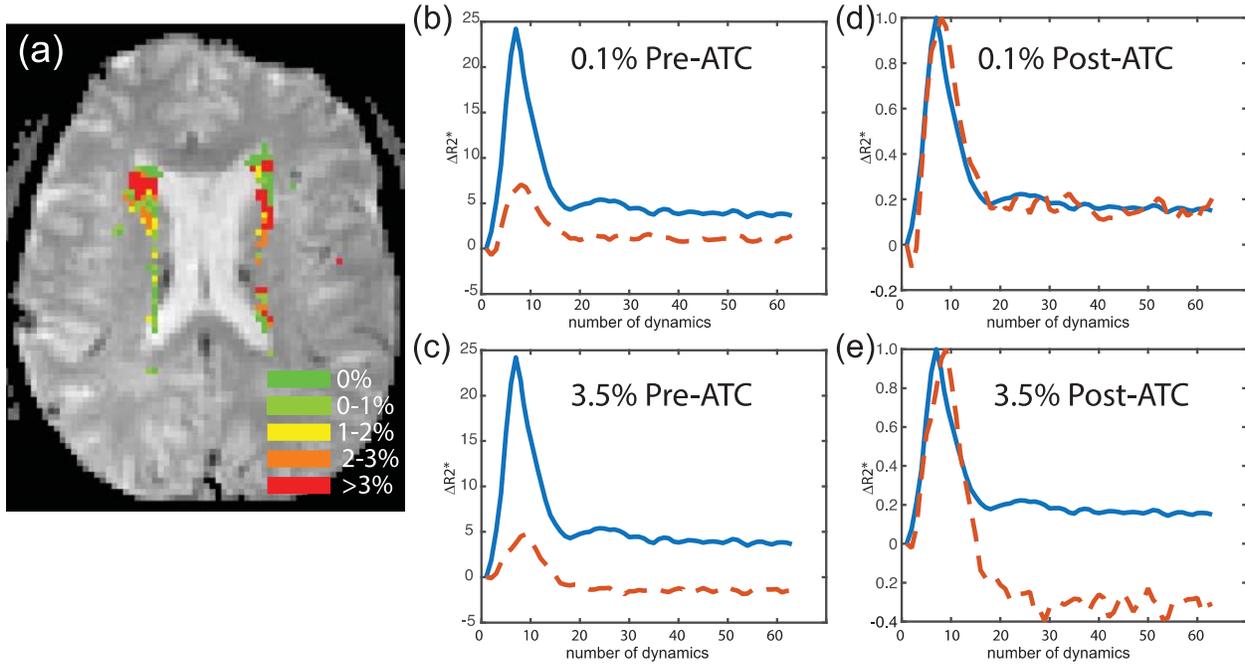


Figure 6: Panel a shows the BBPI heat map overlain on the DSC source image from which it was generated. The color code shows the increasing permeability within the white matter lesions. Panels b-e show the signal change ($\Delta R2^*$) over time (at each dynamic) of the recorded signal (red dashed line) and the normal average signal (solid blue line) before and after applying the arrival time correction (ATC). Panels b and d are for a voxel with a K_2 of 0.1% (a green voxel from panel a). Panels c and e are for a voxel with a K_2 value of 3.5% (a red voxel in panel a). Note that in the setting of BBB disruption, the dashed line is pulled down below the baseline due to the T1 effects from contrast leakage into the tissue.