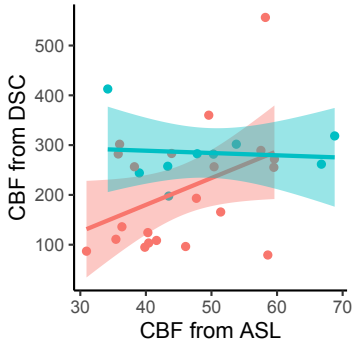
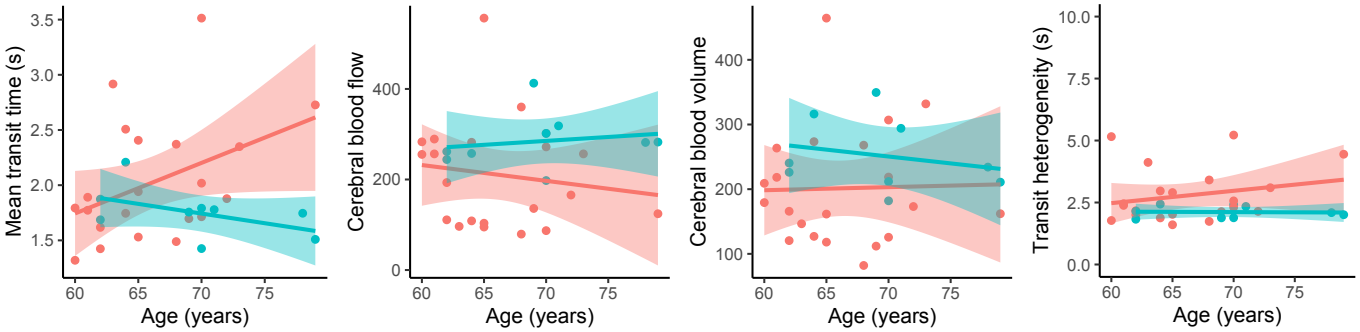
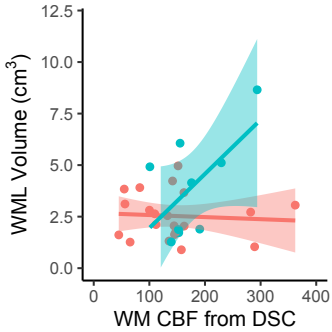


Supplemental Figure 1: Comparison of DSC and ASL in gray matter. This figure shows the relationship between dynamic susceptibility contrast (DSC)- based measures of cerebral blood flow (CBF) and ASL-based measures of CBF in the gray matter. The expected relationship between CBF measured by ASL and DSC is apparent when examining participants without VHS (r=0.417, p=0.06; red), but this is not the case in participants with VHS (r=–0.091, p=0.82; blue). These findings provide further evidence that the presence of VHS may be indicative of impairment in exchange at the capillary level.



Supplemental Figure 2: Age relationships with DSC-based hemodynamic measures in gray matter. Relationships between dynamic susceptibility contrast (DSC)- based measures of mean transit time (MTT), cerebral blood flow (CBF), cerebral blood volume (CBV), and capillary transit heterogeneity (CTH) derived using the approaches described by Mouridsen *et al*.[34] Participants with venous hyperintense signal (VHS+) are shown in blue, and participants without VHS (VHS−) are shown in red. There was an interaction between age and VHS presence when comparing MTT (interaction p=0.07), where VHS+ individuals showed an inverse association between MTT and age and VHS− individuals showed a positive association. None of the other measures exhibited a similar relationship, providing some evidence that the presence of VHS could be related to reductions in overall MTT.



Supplemental Figure 3: Association between WML volume and DSC-based CBF in white matter. This figure shows the relationship between dynamic susceptibility contrast (DSC)- based measures of cerebral blood flow (CBF) in white matter. The expected relationship where lower CBF is correlated with higher WML volume is apparent when examining participants without VHS, but this is not the case in participants with VHS in whom higher CBF is correlated with higher WML volume (interaction p=0.06). These findings are consistent with the hypothesis that higher flow may contribute to capillary flow disturbances and affect oxygen exchange.