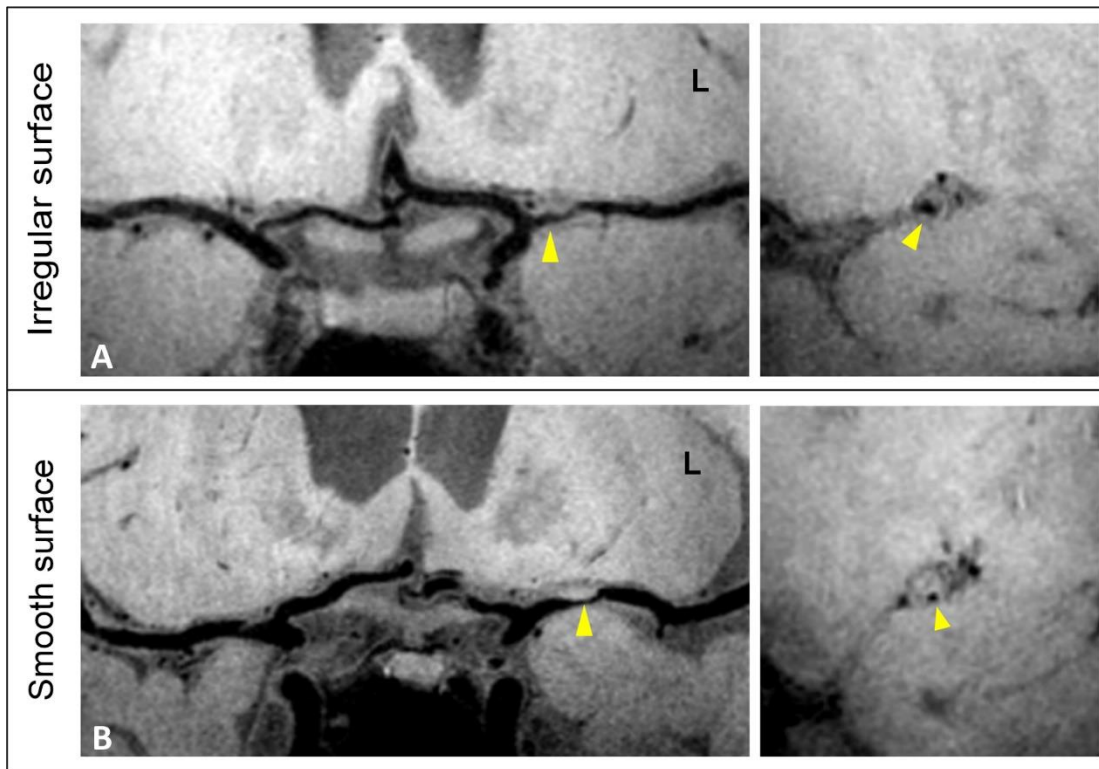


Supplemental Materials

**Report from the Society of Magnetic Resonance Angiography: Clinical applications of 7T
Neurovascular MR in the assessment of intracranial vascular disease**



Supplemental Figure 1. Coronal and sagittal T1-weighted intracranial vessel wall MR (A) show atherosclerotic plaque involving the proximal left M1 MCA with associated irregular plaque surface (arrowheads). Coronal and sagittal T1-weighted intracranial vessel wall MR (B) shows atherosclerotic plaque involving the mid left M1 MCA with smooth plaque surface (arrowheads).

	7-Tesla	3-Tesla
Spatial resolution	++++	++
Contrast-to-noise ratio	++++	+
Signal-to-noise ratio	+++	+
Small lesion depiction	+++	+
Enhanced flow characteristics	+++	++
Susceptibility artifacts	++++	++
Field inhomogeneity	+++	+
Specific absorption rate	+++	++
Acquisition time	+++	++

Supplemental Table 1. Differential advantages and drawbacks of 7-Tesla MRI as compared to 3-Tesla MRI.

Challenges of 7T Neurovascular Imaging	Mitigation Strategies
Field Inhomogeneity	Improved shimming systems
Increased susceptibility	Increasing spatial resolution, shortened TE
Long acquisition times with increased patient motion	Imaging acceleration algorithms (Compressed sensing, parallel imaging, and AI reconstructions) to shorten scan times
Increased specific absorption rate (SAR)	Modified radiofrequency transmit coils, pulse setting adjustments

Supplemental Table 2. Challenges of 7T Neurovascular MR and mitigation strategies to limit these obstacles.

Imaging Techniques	Immediate Use	Potential Future Applications
TOF-MRA	<ul style="list-style-type: none"> • Subtle lumen pathology detection (stenosis/irregularity, small or micro-aneurysm) • Collateral assessment in arterial occlusion • High-flow AVM characterization 	<ul style="list-style-type: none"> • Evaluation of lenticulostriate artery pathology for small vessel disease and association with cognitive function • Improved anatomic detail for computational fluid dynamic simulations and 3D segmentation for AI development
Vessel Wall MR	<ul style="list-style-type: none"> • Improved detection of intracranial arterial wall lesions (atherosclerosis, vasculitis) • Improved plaque surface evaluation and plaque burden assessment • Determination of atherosclerotic ostial involvement for stroke etiology 	<ul style="list-style-type: none"> • Improved intracranial arterial disease morphological and composition characterization (atherosclerosis, cerebral aneurysm) • Small vessel lesion involvement (vasculitis, atherosclerosis, etc.)
4D flow	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Improved flow analysis in intracranial arteries and venous sinuses • Small vessel hemodynamics in association with dementia and stroke risk • Cerebral aneurysm hemodynamics and association with instability
SWI	<ul style="list-style-type: none"> • Venous anatomy and pathology assessment • Vascular malformation detection and characterization 	<ul style="list-style-type: none"> • Cerebral small vessel disease characterization • Microvascular changes in small artery vasculitis

Supplemental Table 3. Current uses and potential future uses for 7T Neurovascular MR techniques.