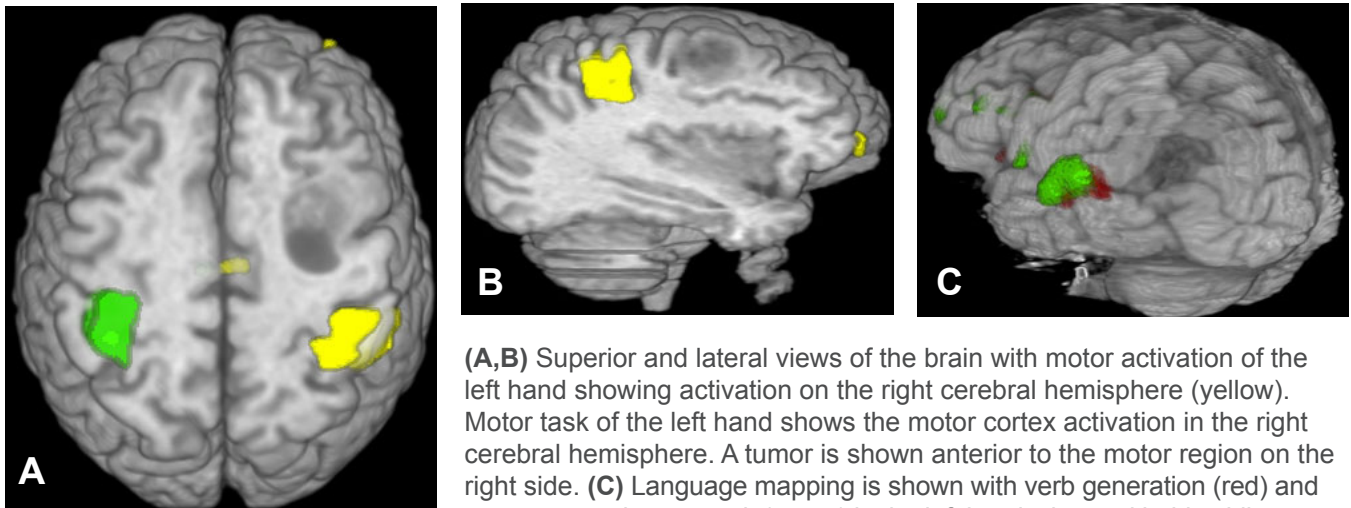




## Diagnostic Service: fMRI

Treatment decisions in patients with AVM's are based on potential risk of brain injury of embolization and surgery compared to radiosurgery. The exact location of brain function and surface geometry varies from one individual to another. An MRI technique developed at MGH, known as BOLD fMRI (blood oxygen level dependent functional MRI) can be used to map a patient's brain function. This examination highlights changes in MRI signal due to alteration in the oxygenation state of hemoglobin. Since blood flow and the proportion of oxygenated blood increases when regions of the brain are active, these regions can be linked to activities such as moving a limb or looking at visual images. Then, with the aid of complex computer algorithms, the planar MR images are converted into three-dimensional representations of the brain. These studies show physicians the precise location of the lesion in relation to the critical regions of the brain.



(A,B) Superior and lateral views of the brain with motor activation of the left hand showing activation on the right cerebral hemisphere (yellow). Motor task of the left hand shows the motor cortex activation in the right cerebral hemisphere. A tumor is shown anterior to the motor region on the right side. (C) Language mapping is shown with verb generation (red) and concrete-vs-abstract task (green) in the left hemisphere with this oblique projection of the braincarotid angiogram shows the aneurysms and the early draining vein of the tiny AVM.

*The Neurovascular Service at Massachusetts General Hospital provides a multidisciplinary approach to patient care that combines neurosurgery, neurology and interventional neuroradiology. Based in the Department of Radiology, the Neurovascular Service's Interventional Neuroradiology Program uses minimally invasive procedures to treat a range of neurovascular disease and spinal disorders. For more information, visit [www.mgh-interventional-neurorad.org](http://www.mgh-interventional-neurorad.org)*

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