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Images of embolic stroke

This patient was studied by me and colleagues in the McConnell Brain Imaging Center at the Montreal Neurological Institute. He was in the acute phase of a devastating embolic stroke. Positron emission tomography was used to measure cerebral blood flow (CBF, upper left), the cerebral metabolic rates for oxygen (CMRO₂, upper right) and glucose (CMRGlu[N], lower left), and the brain pH (CPH, lower right). The intensity of any function can be estimated from the colour, with lower to higher values going from purple to blue to yellow and red. Although this patient's entire right hemisphere is suffering a drop in blood perfusion, relatively smaller brain regions are showing a drop in metabolic function, resulting from a combination of increased extraction fractions for oxygen and glucose, and a switch to anaerobic glycolysis. The latter leads to the accumulation of lactate, which results in the acidosis noted in the CPH image. Such imaging studies not only improve our understanding of stroke pathophysiology but can also be used to test the effectiveness of therapeutic measures. — *Antoine Hakim, MD, PhD*

