In the past, cerebrovascular conditions such as stroke and cerebral aneurysms were treated almost exclusively with surgical techniques that required a craniotomy. Today’s latest neurovascular techniques, however, chart smarter, and less risky, pathways to treat problems in hard-to-reach areas of the brain. “We are radically changing the history of how we treat problems of the brain,” says UCLA neurosurgeon Nestor R. Gonzalez, MD, who was one of the first surgeons in the country to receive complex training in neurosurgery and interventional radiology that enables him to perform both neurosurgery and endovascular neurosurgery. “We now combine conventional surgical techniques with modern endovascular intra-arterial and intra-venous approaches to effectively treat brain lesions that were previously challenging and resulted in less favorable outcomes.”

For example, endovascular coiling is a minimally invasive catheter-based procedure that blocks blood flow to a weakened artery wall in the brain (cerebral aneurysm) to prevent the aneurysm from rupturing. According to Dr. Gonzalez, endovascular coiling is now the dominant form of treatment for aneurysms around the world.
“Several clinical trials have now shown that the coiling technique has excellent outcomes that are superior, in some cases, to craniotomy for treatment of cerebral aneurysms.”

For Dr. Gonzalez, the next frontier is developing surgical techniques to prevent strokes. In a procedure called encephalo-duro-arteriosynangiosis (EDAS) surgery, he reroutes healthy arteries located below the ear and places them in close proximity to narrowed arteries in other areas of the brain. Over time, the rerouted arteries will grow, form new connections with nearby brain tissue and increase blood flow to diseased areas, Dr. Gonzalez explains. To date, he has performed the procedure in more than a 100 patients at UCLA, with good results and few complications. He received the American Heart Association 2012 Innovation Award in Stroke Research for his work in this area.

Over the next 10 years, Dr. Gonzalez anticipates that stroke research will focus on identifying methods to expand treatment for acute stroke patients, including methods of neuroprotection to improve the body’s resistance to stroke, and on advancing stem cell research in the area of brain tissue repair. The goal is to prevent both new and recurrent strokes. Approximately 25 percent of people who recover from their first stroke will have another one within five years.

“MERCI has improved the treatment of stroke in two major ways,” Dr. Gonzalez explains. “Thanks to that development, we can now open arteries from the inside without medications or tools that may potentially increase complications, and we have an expanded window of time to treat patients. Rather than having only a few hours, we now can effectively treat stroke patients using mechanical devices from six to as many as 12 hours after onset of ischemic stroke symptoms.”