

# Improving stroke patient outcomes with evidence-based protocols and a comprehensive approach

Utilizing evidence-based protocols, the latest technology and a unique comprehensive approach, Hoag Hospital is increasingly improving the outcomes of stroke patients.

## Expanding the window of time for treatment

Frontline treatment for stroke with thrombolytic therapy is constrained by the indicated three hour time window. Since the average presentation to the emergency room is between three and six hours after the onset of symptoms, intravenous thrombolysis with tPA is administered to fewer than five percent of patients. Physicians at Hoag now have an effective treatment option that can expand the treatment window up to eight hours after the onset of symptoms.

## New tool for revascularizing occluded vessels

Designed to revascularize large vessel occlusions in the intracranial circulation, the FDA-approved Penumbra thromboembolectomy system provides an effective treatment option that can be used up

to eight hours after the onset of symptoms. The Penumbra System—comprised of a reperfusion catheter, separator and aspiration device—continuously debulks the thrombus while the aspiration pump vacuums the clot debris from the occluded vessel.

The first center in Orange County to employ Penumbra, Hoag Hospital has utilized the device to effectively aspirate clots and restore blood flow to ischemic vessels in a number of patients; it is now included in Hoag’s best practice stroke guidelines to provide the best possible outcomes.

## Comprehensive stroke center

Improved patient outcomes are not only a result of advanced technology, but are directly impacted by Hoag’s evidence-based protocols and multidisciplinary team of medical experts. Led by Medical Director, David M. Brown, M.D., Hoag’s stroke program includes a dedicated stroke unit with specially-trained nurses and staff; neurohospitalists and nurse practitioners that can respond to neuro emergencies

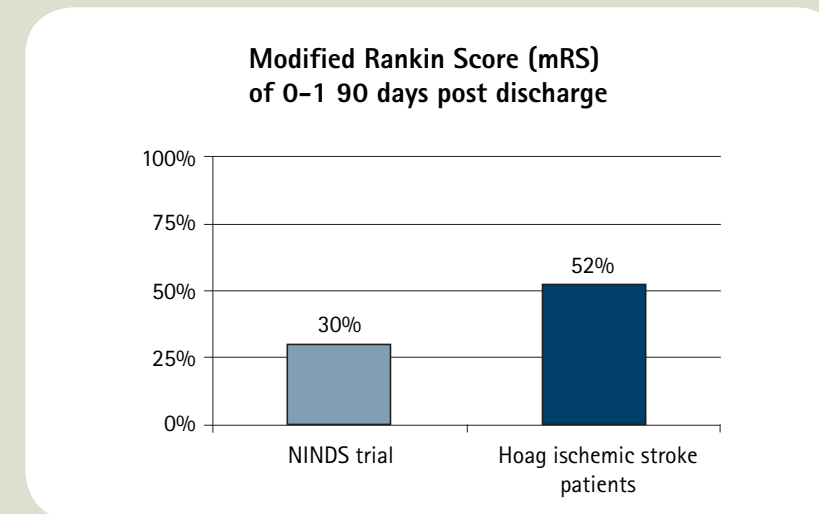
immediately; neuro imaging; neuro interventionalists on-call 24 hours per day; neuro-ICU; stroke-specific care plans; various stroke protocols and stroke support groups.

Also a part of the stroke team, the emergency department physicians and staff are well trained in stroke protocol, termed Code 20 at Hoag. In place since January 2008, Code 20 aims to provide patients arriving at Hoag’s emergency department presenting with signs of stroke with an initial triage assessment, lab testing, and neuro imaging within 20 minutes of their arrival; surpassing the national suggested benchmark of 25 minutes.

As a result of the standardized protocols and comprehensive stroke program, The Orange County Health Care Agency recently designated Hoag Hospital as a Stroke Neurology Receiving Center (SNRC). Now all Orange County Base Hospital and EMS Field units triage and transport patients meeting stroke criteria to the closest designated SNRC for treatment. Prior to this new system, EMS personnel transported stroke patients to the nearest hospital.

## Improved outcomes

More than 30 percent of ischemic stroke patients have minimal or no disability at 90 days post discharge.



## New clinical trial to determine the best protocol

Hoag has been chosen to participate in a new nationwide clinical trial sponsored by the National Institute of Neurological Disorders and Strokes (NINDS), an institute of the National Institutes of Health. Stroke patients who participate will be

randomized to be treated with IV tPA alone or in combination with IA tPA administered at the site of the blood clot and/or by mechanical clot extraction, such as the Penumbra System. At the close of the study, the two treatment arms will be compared to see which protocol generated better patient outcomes.

**To Refer a Patient**  
*For more information or to contact a stroke specialist, please call Hoag Neurosciences Institute at 949/764-6066.*

## Case presentation

Sixty-one year old male knocked over a glass with left hand while setting the table for dinner at 5:10 p.m.

His wife noticed left face, arm and leg weakness and called 911. Patient arrived at the ED via paramedic transport at 5:45 p.m. Code 20 was called, initiating Hoag’s rapid response stroke team to the patient for emergency evaluation and treatment. Patient to CT within 18 minutes.

## Neuro assessment

Head CT perfusion scan revealed large right MCA occlusion with some ACA involvement; perfusion deficit. Patient’s NIH Stroke Scale (NIHSS) was 17: mild dysarthria; left face, arm and leg weakness; visual field deficit and right gaze preference.

## Patient history

Stroke, CABG, AICD, PAD, Hypercholesterolemia

## Treatment

IV tPA was administered. Because of the large clot burden, the patient was then transferred to Interventional Radiology for IA tPA and thrombectomy with the Penumbra System. Post tPA Head CT revealed interval revascularization with a small zone of wedge shape perfusion defect in right temporal lobe. After a 24-hour ICU stay, patient was transferred to the Stroke Unit and PT/OT/ST were initiated. Patient transferred to an acute rehabilitation facility and discharged on the fourth day with a NIHSS of 4.