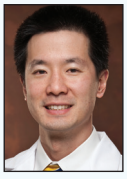
ASK THE EXPERTS

Stroke Game Changers: Which Trials Have Most Affected Your Algorithms?

With Michael Chen, MD; Ameer Hassan, DO; and James Milburn, MD, MMM, FACR, FSNIS



Michael Chen, MD
Professor of Neurology, Neurosurgery & Radiology
Rush University Medical Center
Chicago, Illinois
michael_chen@rush.edu

Our stroke team's algorithm has historically been quite liberal, particularly owing to evidence showing that thrombectomy was effective even among patients with large core infarctions. Implicit in the recent series of consecutive stroke thrombectomy trials was that patients seemed to be better off with their vessel open rather than occluded. As a result, the default option was to pursue thrombectomy on any patient with an arterial occlusion leading to a disabling deficit. The recent distal thrombectomy studies that showed no benefit from thrombectomy (DISTAL, ESCAPE-MeVO, and DISCOUNT), particularly in patients with lower National Institutes of Health Stroke Scale (NIHSS) score, have changed our workflow. There are legitimate criticisms of the trials, such as whether the appropriate outcome measures were used, whether newer-generation thrombectomy devices may be more effective, and whether lack of clinical equipoise may have influenced enrollment. Nevertheless, the three trials did show the challenge of demonstrating benefit when the severity of the neurologic deficit/disability is low. As a result, we are less inclined to pursue thrombectomy with an occlusion that is distal M2 and beyond, particularly with an NIHSS ≤ 6.

If the NIHSS is > 6 and the occlusion is distal, we may proceed with intra-arterial administration of tenecteplase or use the newer-generation aspiration catheters, which may have a better efficacy and safety profile than the stent retrievers predominantly used in the recently published trials. Careful anesthesia is also important to optimize cerebral perfusion during the procedure and ensure patient movement is minimized.

Perhaps the equipoise that results from these negative distal thrombectomy trials may improve enrollment in future trials. However, a promising trend is that with the year-over-year increase in thrombectomy volumes combined with device technology iterations, our improved technical procedural efficacy should contribute to even better clinical outcomes for a wider variety of patients.

Ameer Hassan, DO
Professor of Neurology and Radiology
University of Texas
Head of Neuroscience Department
Valley Baptist Medical Center
Harlingen, Texas
ameerehassan@gmail.com

A major update to our stroke treatment protocol followed the results of the SELECT2 trial. Historically, even during our active enrollment in DAWN, we were cautious about treating patients with large core infarcts, particularly in the extended time window. Most of our patients arrive > 6 hours after onset and often show significant infarcts on imaging. The insights from SELECT2, alongside other major studies released in 2023, offered the necessary evidence to treat these patients safely and effectively, broadening our eligibility criteria and

enhancing outcomes for a group we previously would have excluded.

More recently, the DISTAL and ESCAPE-MeVO trials have influenced our strategy regarding distal occlusions with low NIHSS scores. These studies demonstrate that the risk-benefit ratio does not support thrombectomy for patients presenting with very mild symptoms and distal branch occlusions. Consequently, we typically choose to postpone intervention in these scenarios. It is important to note that we do not apply this new guideline to M2 occlusions, as we still regard M2s as large vessel occlusions warranting intervention.

Looking ahead, we are optimistic. With the advent of newer, smaller, and safer devices, we hope to identify the appropriate patients and techniques to extend treatment safely to distal occlusions, ultimately improving outcomes across the full range of stroke severity.

James Milburn, MD, MMM, FACR, FSNIS
Vice Chair of Radiology
Director of Neurointerventional Services
Residency Program Director
Ochsner Medical Center
New Orleans, Louisiana
jmilburn@ochsner.org

Recent publications in the stroke literature that have affected my team's practice include the positive large core trials and, more recently, the negative medium vessel occlusion (MeVO) trials. In recent years, stroke treatment has benefited from positive data in areas like late window, posterior circulation, and, more recently, large core. However, the most recent MeVO trials have been a setback, causing many to reconsider our indications for MeVO thrombectomy.

The most impactful positive recent evidence came from the large core trials: RESCUE-Japan LIMIT, ANGEL-ASPECT, SELECT2, TESLA, TENSION, and LASTE. Five of these six trials met the primary efficacy point, and there was one near miss. These trials showed that thrombectomy was safe and effective in the large core infarct population, with the greatest increases seen in modified Rankin Scale (mRS) 2 and 3 and reduction in the number of mRS 5 patients by almost half. This has caused my team to accept more transfers and perform more thrombectomies on patients with large core infarcts from our 53-site stroke network.

More recent MeVO trials (ESCAPE-MeVO and DISTAL) published in *The New England Journal of Medicine* this year failed to demonstrate a benefit from thrombectomy in MeVO and distal vessel occlusions. Many groups, like mine, were treating M2, M3, P2, and A2 lesions before these trials were presented, but the results have made us reconsider some of these patients. It should be said that there could have been bias away from randomizing some patients who were more likely to benefit in these trials. Also, the vast majority of trial patients were treated using stent retrievers, while contact aspiration is my group's usual first-line technique. Perhaps future trials could benefit from inclusion criteria requiring favorable perfusion imaging, higher initial NIHSS, and lower baseline mRS to prove benefit in at least a subgroup of these patients. Imperative Care has announced its plan to perform an upcoming M2 trial, which I hope will add clarification. Our group still performs thrombectomy for accessible secondary MeVOs resulting from treatment of a more proximal occlusion, as these were not studied in the recent trials. ■

Disclosures
Dr. Chen: Consultant to Medtronic, MicroVention, Penumbra, Cerenovus, Siemens, Route92, RapidPulse, Imperative Care, Genentech, Kaneka, Vesalio, and Stryker.
Dr. Hassan: Consultant to/speaker for Medtronic, MicroVention, Stryker, Penumbra, Cerenovus, Genentech, GE Healthcare, Scientia, Balt, Viz.ai, Insera Therapeutics, Proximie, NeuroVasc, NovaSignal, Vesalio, Rapid Medical, Imperative Care, Galaxy Therapeutics, Route 92, Perfuze, CorTech, Imago Rehab, Shockwave, Toro Neurovascular, NeuroVasx, XCath, Kaneka, and Plaga; Principal Investigator for COMPLETE (Penumbra, Inc.), SYNCHRONISE: LVO (Viz.ai), MARRS (Perfuze), RESCUE-ICAD (Medtronic), and Neva VS DILATE (Vesalio); steering committee/publication committee member for SELECT, DAWN, SELECT2, EXPEDITE II, EMBOLISE, CLEAR, ENVI, DELPHI, DISTALS, and Rapid Pulse; data and safety monitoring board, COMMAND trial.
Dr. Milburn: Consultant to and speaker for Imperative Care and MicroVention; scientific advisory board for Optimize NeuroVascular; Mentorship Chair and ex-officio position on Board of Directors for Society of NeuroInterventional Surgery; Director-at-Large, Board of Directors for American Society of Neuroradiology.