

Aspiration equally effective as, and significantly cheaper than, traditional stent retriever approach for clot removal

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Sucking a clot directly out of the artery in patients experiencing a stroke is just as effective as, and significantly cheaper than, removing it by use of a stent, according to a study co-led by researchers at the Icahn School of Medicine at Mount Sinai and published in print March 9 in *The Lancet*.

The study, known as COMPASS, concerned large vessel occlusion stroke, the most devastating kind of ischemic stroke. It compared the direct [aspiration](#) first pass (ADAPT) approach to the current standard of care, stent retriever first-line (SRFL), for mechanical [clot](#) removal (thrombectomy) in [patients](#) suffering acute ischemic strokes.

"Our data strongly demonstrates that the two approaches have comparable clinical results, meaning that patients do just as well when you start with aspiration, or clot suction, as when you start with a stent retriever to trap and pull out the clot," says J Mocco, MD, MS, Vice Chair of Neurosurgery and Director of the Cerebrovascular Center for the Mount Sinai Health System and senior author of the study.

"COMPASS is the first prospective randomized trial designed to compare both patient outcome and cost between these treatment approaches, and we found that patients do equally well with the aspiration approach, which is significantly cheaper."

Both techniques are initiated by inserting a guide catheter into the

femoral artery in the groin and guiding it up into the brain under image guidance. The aspiration-first approach involves passing a specialized aspiration microcatheter through the guide catheter, moving it directly to the lesion, and then attaching it to an aspiration pump. Once attached to the suction system, the catheter is advanced into the end of the clot, suction is initiated, and the clot is either aspirated through the catheter or it becomes stuck at the catheter tip and is withdrawn back into the guide catheter.

The SRFL approach involves introducing a stent retriever, which resembles a tiny wire cage, through the guide catheter and moving it to the clot. The stent then opens up and traps the clot, and then both are removed through the guide catheter.

The COMPASS trial enrolled 270 patients into a prospective, randomized, open-label, blinded outcome assessment and core lab adjudicated trial to assess the clinical outcome of the patient, meaning how functional they were after treatment with either ADAPT using a large-diameter aspiration [catheter](#) (ACE68™) system, made by Penumbra Inc., or an SRFL approach. To compare clinical outcomes, researchers used the modified Rankin scale for neurologic activity (mRS), a standard measurement of the degree of disability or dependence in the daily activities of people who have suffered a stroke, which runs from 0 (no symptoms at all) to 6 (dead). The data showed that the ADAPT technique was non-inferior to stent retrievers for treatment of large vessel occlusions: 51.5 percent of patients treated with Penumbra's aspiration system achieved the primary endpoint of independence (mRS 0-2) at 90 days compared with 49.3 percent of patients treated with stent retrievers. Final revascularization rates were also similar for the two study groups: 91.7 percent of patients treated with aspiration achieved TICI compared to 90.4 percent with stent retrievers ($p=0.83$). Moreover, the percentage of patients achieving TICI 3 was 37.6 percent for the ADAPT arm and 27.2 percent for the stent

retriever arm ($p=0.09$).

Secondary safety endpoints presented, including embolization in new territory (ENT) and symptomatic intracranial hemorrhage (sICH), were not statistically different between the two groups.

Using prespecified device-related procedural cost analyses, the COMPASS trial showed that the aspiration-first cohort had significantly lower device costs across all analysis methods. When using aggregate supply chain data as the primary source and list price as the secondary source, the aspiration-first group had a mean \$4,541 reduction in the cost of devices used compared with the stent retriever first line group. When using list price as the primary source and aggregate supply chain data as the secondary source, the aspiration-first group had a mean \$5,074 reduction in the cost of devices used. Furthermore, the reduction in median device costs was even greater (\$6157.40 and \$6,838, respectively) (p

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