

Endovascular treatment (Old trials):

Trial	Inclusion criteria	Treatment arms	Results
IMS-I (Interventional management of stroke)		IV + IA tPA Compared with NINDS results (IV tPA)	Better outcome than NINDS
IMS-II		IV + IA tPA + low energy ultrasound	Better outcome and lower mortality than NINDS
IMS-III (2013)	- iv tPA within 3 hours of onset - NIHSS>10 or >8 with CTA evidence of LVO (ICA, M1 or basilar)	IV tPA vs IV tPA + endovascular treatment	No difference between both arms but established safety of interventional therapy. Limitations: <ul style="list-style-type: none"> - Longer time to endovascular therapy than IMS 1 and 2 - Limited use of newer stent retrievers - Not all subjects had documented LVO - Smaller dose of iv tPA in the intervention arm
Synthesis (2013)	IV tPA candidate within 4.5h and endovascular ttt possible in 6h.	IV tPA versus intra-arterial tPA (IAT) ± embolectomy devices	Interventional therapy is NOT SUPERIOR to standard of care
MR RESCUE (2013)	large vessel, anterior circulation patients	embolectomy (using Merci or Penumbra system) vs standard care	Interventional therapy is NOT SUPERIOR to standard of care. Limitations: <ul style="list-style-type: none"> - Revascularization was achieved in ONLY 67% of patients. - Use of first generation devices. - Long time window

Endovascular treatment (Recent trials):

Trial	Inclusion criteria	Treatment arms	Results
MR CLEAN (2014)	Anterior circulation patients with evidence of LVO within 6h from onset.	Standard treatment vs standard treatment PLUS endovascular treatment	Endovascular treatment was effective AND safe . No difference in mortality or symptomatic ICH
ESCAPE (2015)	Proximal intracranial arterial occlusion, small infarct core, and moderate to good collateral circulation -Time window: 12 hours -Patients with large infarct core or poor collaterals were excluded	Standard treatment vs. standard treatment PLUS mechanical thrombectomy	Endovascular treatment was effective AND safe . - Primary outcome for intervention plus standard care vs. standard care alone <u>53% vs. 29.3%</u> - Mortality 10.4 vs. 19% (p: 0.04) - sICH 3.6% vs. 2.7% (p: 0.75)
EXTEND-IA (2015)	Proximal intracranial arterial occlusion, small infarct core, and moderate to good collateral circulation Time window: 6h Imaging: CT – CTA – <u>CTP</u>	Standard treatment vs. standard treatment PLUS mechanical thrombectomy with Solitaire retriever	Endovascular treatment was effective AND safe . - Early neurological improvement: 80% vs. 37% - mRS 2 or less at 90 days: 70% vs. 40%
SWIFT-PRIME (2015)	Proximal intracranial arterial occlusion, small infarct core, and moderate to good collateral circulation Time window: 6h Imaging: CT – CTA – <u>CTP</u>	Standard treatment vs. standard treatment PLUS mechanical thrombectomy with stent retriever	thrombectomy with a stent retriever within six hours from symptoms onset improved functional outcome at 90 days - mRS 2 or less at day 90: 60% vs. 35%
REVASCAT	NIHSS score of ≥ 6 Intracranial ICA or M1 occlusion by CTA, MRA, or DSA. Groin puncture possible within 8h ASPECT < 7 in CT or < 6 in DWI were EXCLUDED	Standard treatment vs IV tPA plus endovascular treatment with Solitaire FR device	Endovascular treatment was effective AND safe . - mRS 2 or less at day90: 43.7% vs. 28.2%

- The old trials (MS, Synthesis & MR RESCUE) used almost exclusively intra-arterial r-tPA and first-generation endovascular devices alone or in combination, achieved recanalization rates of 25% to 41%.
- The new trials (MR CLEAN, EXCAPE, EXTEND, SWIFT & REVCAST) using almost exclusively stent retrievers demonstrated improved results for both recanalization rates and outcome.
- Clinical outcome improved with increasing effectiveness of recanalization. Those with partial recanalization (TICI 2a) did not do as well as those with near complete/complete recanalization.
- TICI 2b/3 reflected as differences in discharge disposition (41.0% of TICI 2b/3 group discharged home vs 17.4% of TICI 2a) and functional outcome (34% with a TICI grade of 2a had an mRS score of 0 to 2 at 90 days vs in 49% a TICI grade of 2b/3).