Hypoperfusion intensity ratio

In a retrospective cohort study Asimos et al. from Atrium Health, Charlotte (Emergency Medicine, Neurosciences Institute, Quality Analytics, Radiology, Neurosurgery, Neurology) published in the Interventional Neuroradiology Journal to assess whether hypoperfusion intensity ratio (HIR) and cerebral blood volume index (CBVI) measured via CT perfusion at referring non-thrombectomy centers predict favorable 90-day outcomes post-transfer for thrombectomy in anterior circulation large vessel occlusion (ACLVO). CBVI—as a continuous measure and specifically > 0.7—correlated with functional independence (mRS ≤ 2) at 90 days both overall and in recanalized patients. In contrast, HIR thresholds and combined collateral scores were not predictive [1].

Critical Review

Strengths

Excellent sample size (n = 497), with high treatment prevalence (93% thrombectomy) supporting real-world relevance.

Rigorous adjustment for confounders in multivariable models enhances validity.

Weaknesses

Retrospective and single-center design at a large referral system may limit external generalizability.

No direct comparisons to other perfusion metrics like Tmax or ischemic core volumes—makes it difficult to situate CBVI within broader CTP prognostication tools.

HIR binary thresholds (0.4–0.6) may lack granularity; their univariate non-association could stem from arbitrary cutoffs rather than biological irrelevance.

Unclear reproducibility or inter-observer reliability of CBVI quantification across centers or software versions.

Statistical note

Adjusted OR of 1.73 for CBVI > 0.7 is clinically meaningful, but confidence interval (1.13–2.65) suggests moderate precision.

Final Verdict

Rating: 6.5 / 10

Takeaway for practitioners: CBVI from CT perfusion at referring centers could offer a pragmatic predictor of functional independence after thrombectomy, especially when > 0.7. However, its standalone prognostic value remains uncertain until validated prospectively and benchmarked against established perfusion metrics.

Bottom line: CBVI appears promising as a simple, transportable predictor of favorable outcome in

ACLVO, but further multi-center, prospective validation and comparison studies are needed before adoption into routine transfer decision-making.

Categories: Retrospective Studies, Stroke Imaging, Thrombectomy Outcomes

Tags: CT perfusion, CBVI, HIR, collateral perfusion, stroke prognostication, thrombectomy, anterior circulation LVO

1)
Asimos AW, Yang H, Strong D, Teli KJ, Clemente JD, DeFilipp G, Bernard J, Stetler W, Parish JM, Hines A, Rhoten JB, Karamchandani RR. Association of hypoperfusion intensity ratio and cerebral blood volume Index with good outcome in patients transferred for thrombectomy. Interv Neuroradiol. 2025 Jul 10:15910199251352046. doi: 10.1177/15910199251352046. Epub ahead of print. PMID: 40638076.