

# In a Cohort Study, TCAR's 3-Year Stroke Risk is Equivalent to CEA, Despite Being Performed in More Comorbid and High-Risk Patients

## Background:

Transcarotid artery revascularization (TCAR) has seen widespread adoption in contemporary practice. However, the risk of stroke after TCAR versus carotid endarterectomy (CEA) beyond the perioperative period remains poorly defined. The objective was to compare the 3-year risk of stroke after TCAR versus CEA.

## Methods:

A retrospective cohort study was conducted using data from the Vascular Implant Surveillance and Outcomes Network (VISION), a procedural registry linked to Medicare claims that captures clinical, procedural, and outcomes data for patients undergoing carotid revascularization. Patients who underwent TCAR or CEA between October 1, 2016 and December 31, 2019 were included. The primary exposure was surgery type (TCAR or CEA), and the primary outcomes were stroke and death. Asymptomatic and symptomatic patients were analyzed separately. Kaplan-Meier analysis and Cox regression were used for risk adjustment, with competing-risk and propensity score methods applied for sensitivity analyses.

## Results:

There were 19,141 asymptomatic (TCAR:3,482, CEA:15,659) and 12,343 symptomatic (TCAR:2,377, CEA:9,966) patients who underwent carotid surgery. Patients who underwent TCAR were older, more likely to be female, and more likely to be anatomic high-risk. Among asymptomatic patients, the 3-year risk of stroke was similar after TCAR (5.1% [95%CI:3.0-7.1%]) and CEA (4.9% [95%CI:4.4-5.4%], log-rank p=0.93). The composite 3-year risk of stroke or death was 22.6% (95%CI:18.8-26.3%) after TCAR and 20.0% (95%CI:18.8-21.2%) after CEA (log-rank p 0.17). The composite 3-year risk of stroke or death risk was 35.9% (95%CI:30.1-41.2%) after TCAR and 30.0% (95%CI:28.3-31.7%) after CEA (log-rank p<0.001). Compared to CEA, the adjusted HR for stroke after TCAR among symptomatic patients was 1.00 (95%CI: 0.75-1.33).

## Conclusions:

In this comparative-effectiveness study, TCAR had a similar risk of stroke to CEA. This was durable over 3 years of follow-up and was consistent among asymptomatic and symptomatic patients. These results can inform procedure choices for both patients and providers alike when considering carotid surgery and help to inform requisite shared decision making prior to intervention.

|              | TCAR                 | CEA                  | HAZARD RATIO |
|--------------|----------------------|----------------------|--------------|
| Asymptomatic | 5.1%                 | 4.9%                 | HR = 1.1     |
| Symptomatic  | 16.6% (S); 25.4% (D) | 13.6% (S); 21.2% (D) | HR =1        |

### Patient Risk Profile Compared to CEA:

- ✓ Higher anatomical risk
- ✓ Higher comorbid risk
- ✓ More likely to be older
- ✓ More likely to be female
- ✓ More likely to be on P2Y12

*"Therefore, it is notable that, despite being performed in a more comorbid and high-risk cohort, the unadjusted 3-year stroke risk remains statistically similar to CEA."*

Columbo JA, Martinez-Cambor P, Stone DH, Goodney PP, Creager MA, MacKenzie TA, Chen H, O'Malley AJ, Hicks CW. Three-year risk of stroke after transcarotid artery revascularization versus carotid endarterectomy among Medicare beneficiaries. J Vasc Surg. 2025 Jul 11:S0741-5214(25)01401-6.doi:10.1016/j.jvs.2025.06.052. Online ahead of print.



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