

Hospital Length of Stay Among Medicare Beneficiaries Undergoing Transcarotid Artery Revascularization versus Carotid Endarterectomy: A Retrospective Claims Analysis

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BACKGROUND

- Carotid revascularization is a commonly performed intervention to reduce stroke risk in patients with carotid artery disease (CAD).
- Transcarotid artery revascularization (TCAR) and carotid endarterectomy (CEA) are established treatment options with differing approaches and perioperative recovery profiles, including hospital length of stay (LOS).
- Evaluating LOS differences between TCAR and CEA in real-world populations may provide insight into their relative impact on inpatient hospital resource use and overall system capacity.

OBJECTIVES

To compare inpatient hospital LOS between TCAR and CEA among Medicare beneficiaries with CAD.

METHODS

Study Design: Retrospective claims analysis.

Data Source: Medicare 100% Standard Analytical Files.

Study Population:

- Medicare Fee-for-Service (FFS) beneficiaries aged 65+ with a diagnosis of extracranial CAD who underwent TCAR or CEA between January 1, 2021 and December 31, 2024.
- Both symptomatic and asymptomatic patients, including those at high and standard surgical risk, were included.
- Continuous Medicare FFS enrollment for at least 12 months prior to the index procedure was required.

Exclusion Criteria:

- Patients undergoing intracranial thrombectomy or coronary artery bypass grafting during the index hospitalization were excluded.

Outcome Measures:

- The primary outcome was hospital LOS, defined as the number of inpatient days during the index hospitalization.

Statistical Analyses:

- Descriptive statistics were used to summarize patient cohorts.
- Mean LOS was compared using unpaired t-tests, and median LOS distributions were compared using Mann-Whitney tests.

RESULTS

The study cohort included 15,316 TCAR and 77,733 CEA patients (**Figure 1**).

TCAR patients had a shorter mean \pm standard deviation (SD) inpatient hospital LOS than CEA patients (2.33 ± 3.36 versus 2.44 ± 3.57 days) (**Table 1**). The absolute mean LOS difference of 0.11 days (≈ 2.6 hours) corresponds to approximately 11 hospital bed-days saved per 100 TCAR cases compared with CEA.

Median LOS was 1 day for both procedures (interquartile range [IQR]: 1-2 days); however, LOS distributions differed significantly between procedures (**Table 1**).

Fewer TCAR patients had stays >1 day or >2 days compared with CEA patients (**Table 1**).

Figure 1. Cohort Attrition for (A) TCAR and (B) CEA

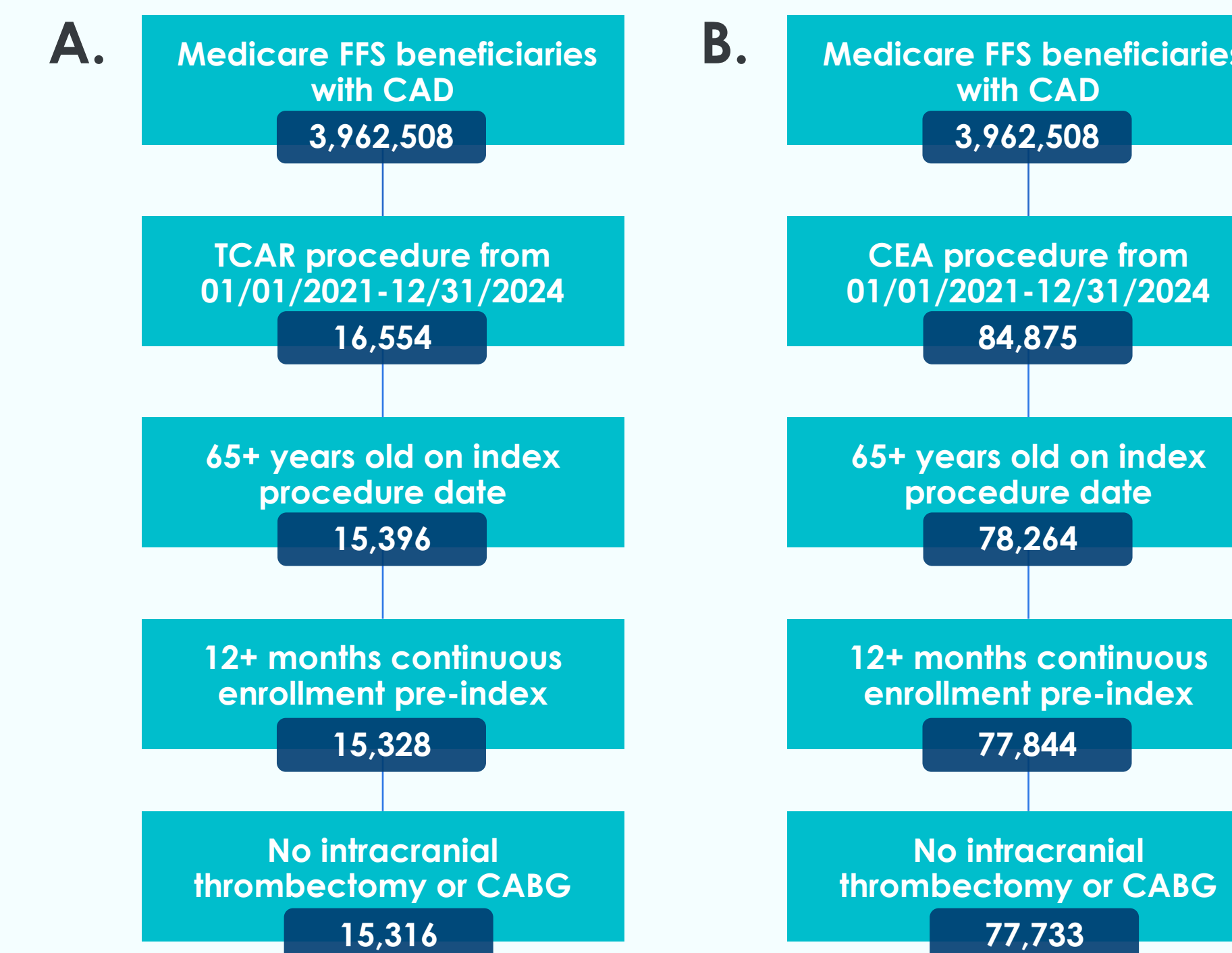


Table 1. Inpatient LOS Among Medicare Beneficiaries Undergoing TCAR versus CEA

LOS Metric	TCAR	CEA	p-value
Mean LOS, days \pm SD	2.33 ± 3.36	2.44 ± 3.57	<0.01
Median LOS, days (IQR)	1 (1-2)	1 (1-2)	<0.01
LOS >1 day, %	33.7	35.3	<0.01
LOS >2 days, %	20.9	22.4	<0.01

Median LOS distribution compared using Mann-Whitney test.

CONCLUSIONS

- Among Medicare beneficiaries, TCAR was associated with statistically significant reductions in hospital LOS compared with CEA.
- Although median LOS was similar between groups, TCAR was associated with fewer prolonged hospitalizations, reflected in a significant difference in LOS distribution.
- These findings suggest TCAR procedures may improve hospital efficiency through reduced resource utilization and increased bed-day availability.
- Further research is warranted to quantify downstream economic implications and broader health system impacts of the LOS differences.

LIMITATIONS

- This study was a retrospective analysis of administrative claims data and is therefore subject to potential coding errors and misclassification.
- Hospital LOS may also be influenced by institutional practices, discharge patterns, and regional variation, which were not explored in this analysis.
- The study population was restricted to Medicare FFS beneficiaries aged 65+, which may limit the generalizability of findings to younger populations or those with other types of insurance.

DISCLOSURES

This study was funded by Boston Scientific. SM, AMM, WW, and AOW are full-time employees of, and shareholders in, Boston Scientific. KM was a full-time employee of Boston Scientific at the time of this research.