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# 2023 Carotid Revascularization: Carotid Artery Stenting (CAS) and Carotid Endarterectomy (CEA)

## *Cardiology Services*

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# Table of Contents

# Carotid Revascularization, Carotid Artery Stenting (CAS)

**NCD 20.7**
*See also*, **NCD 20.7**: Percutaneous Transluminal Angioplasty (PTA) at https://www.cms.gov/medicare-coverage-database/search.aspx *if applicable to individual's healthplan membership*.

## CAS Guideline

Carotid artery stenting (CAS) (with or without angioplasty) is considered medically appropriate when the documentation demonstrates **ALL** of the following:[1][9] [19] [17]

I. Computed tomography angiography (CTA), duplex ultrasound or magnetic resonance angiography (MRA) recently performed (within the past 6 months) [2]

II. Clinical situation is **ANY** of the following:

A. Asymptomatic and **ALL** of the following: [8] [5]

1. 60% or greater stenosis in presence of clinical or imaging characteristics that may be associated with an increased risk of ipsilateral stroke
2. Carotid endarterectomy (CEA) is high risk (eg, anatomic or medical conditions that increase the risk for surgery).
3. Life expectancy is more than 5 years.
4. Perioperative stroke/death rates are less than 3%. (***NOTE** *American College of Surgeons surgical risk calculator can be found at:* https://riskcalculator.facs.org/RiskCalculator/index.jsp)

B. Symptomatic (eg, amaurosis fugax or transient ischemic attack) and **ALL** of the following: [2,3][11]

[1]Transcarotid artery revascularization (TCAR) is another procedure for high-risk individuals with coronary artery stenosis. TCAR delivers the stent for the stenosis while avoiding catheterizaiton of the arch and lesion.

[2]Carotid endarterectomy (CEA) is recommended over trans-femoral carotid artery stenting in low/standard risk patients with 50% or more symptomatic carotid artery stenosis (Grade 1, Quality of Evidence: A). In selected asymptomatic patients at increased risk for carotid stenosis, screening is suggested, if willing to consider carotid intervention if significant stenosis is discovered (Grade 2,B). [2]

[3]Selection for revascularization in asymptomatic patients should be guided by assessment of comorbidities, life expectancy, should include procedural risk/benefits and understanding of individual preferences (Class I, LOE: C); It is reasonable to

1. Age is less than 70 years. [16] [8]
2. Anatomy is suitable for carotid artery stenting. [15]
3. Carotid artery stenosis is 50% or more by catheter-based imaging or 70% or more by noninvasive imaging.
4. Carotid endarterectomy (CEA) surgery is high-risk [4] for anatomic or medical reasons. [18]
5. Periprocedural stroke/death rate risk is less than 6%.

## Transcarotid Artery Revascularization (TCAR) Guideline

A transcarotid artery revascularization (TCAR) is considered medically appropriate when the documentation demonstrates **ALL** of the following: [10] [3] [12]

I. Anatomy is appropriate for the procedure.

II. Carotid artery stenosis in both carotid arteries or restenosis (stenosis that returns after surgery).

III. Computed tomography angiography (CTA), duplex ultrasound or magnetic resonance angiography (MRA) recently performed (within the past 6 months) [2]

IV. Higher surgical complication risk due to **ANY** of the following:

- A. Age 75 years or older
- B. Diabetes that is uncontrolled.
- C. Coronary history of heart failure NYHA Class III or IV, unstable angina or myocardial infarction (MI) in the past 6 weeks
- D. Head or neck surgical or irradiation history [13]
- E. Pulmonary disease that is severe.

V. Clinical situation is **ANY** of the following:

- A. Asymptomatic and **ALL** of the following: [8] [5]
  1. 60% or greater stenosis in presence of clinical or imaging characteristics that may be associated with an increased risk of ipsilateral stroke

perform CEA for asymptomatic, 70% or more stenosis of ICA if perioperative risk is low (Class IIa, LOE: A); Prophylactic CAS might be considered in highly selected with asymptomatic carotid stenosis (60% or more by angiography, 70% by Doppler US), but its effectiveness compared with medical therapy alone in this situation is not well established (class IIb, LOE:B). [6]

[4] **High-Risk CEA** is having significant comorbidities and/or anatomic risk factors including: previous CEA with recurrent stenosis, prior radiation treatment to neck, contralateral carotid occlusion, recent myocardial infarction, unstable angina, heart failure class III/IV and left ventricular ejection fraction less than 30%. [8]

2. Life expectancy is greater than 5 years.
3. Perioperative stroke/death rates are less than 3%.

B. Symptomatic (eg, amaurosis fugax or transient ischemic attack) and **ALL** of the following: [11]

1. Carotid artery stenosis is 50% or more by catheter-based imaging or 70% or more by noninvasive imaging.
2. Periprocedural stroke/death rate risk is less than 6%.

## CAS Procedure Codes

**Table 1. Carotid Revascularization, Carotid Stenting (CAS) Associated Procedure Codes**

| CODE | DESCRIPTION |
|---|---|
| 37215 | Transcatheter placement of intravascular stent(s), cervical carotid artery, open or percutaneous, including angioplasty, when performed, and radiological supervision and interpretation; with distal embolic protection |
| 37216 | Transcatheter placement of intravascular stent(s), cervical carotid artery, open or percutaneous, including angioplasty, when performed, and radiological supervision and interpretation; without distal embolic protection |
| 37217 | Transcatheter placement of intravascular stent(s), intrathoracic common carotid artery or innominate artery by retrograde treatment, open ipsilateral cervical carotid artery exposure, including angioplasty, when performed, and radiological supervision and interpretation |
| 37218 | Transcatheter placement of intravascular stent(s), intrathoracic common carotid artery or innominate artery, open or percutaneous antegrade approach, including angioplasty, when performed, and radiological supervision and interpretation |
| C9601 | Percutaneous transcatheter placement of drug-eluting intracoronary stent(s), with coronary angioplasty when performed; each additional branch of a major coronary artery (list separately in addition to code for primary procedure) |
| C9602 | Percutaneous transluminal coronary atherectomy, with drug eluting intracoronary stent, with coronary angioplasty when performed; single major coronary artery or branch |
| C9603 | Percutaneous transluminal coronary atherectomy, with drug-eluting intracoronary stent, with coronary angioplasty when performed; each additional branch of a major coronary artery (list separately in addition to code for primary procedure) |

# Carotid Revascularization, Carotid Endarterectomy (CEA)

## CEA Guideline

A carotid endarterectomy (CEA) is considered medically appropriate when the documentation demonstrates **ALL** of the following: [19] [2] [17] [1] [4]

I. Computed tomography angiography (CTA), duplex ultrasound or magnetic resonance angiography (MRA) recently performed (within the past 6 months)

II. Clinical situation is **ANY** of the following: [6]

A. Asymptomatic and **ALL** of the following:

1. Carotid stenosis is 70% or more.
2. Life expectancy is 3 years or longer.
3. Maximum medical management is in place.[5][15] [7]
4. Perioperative risk of stroke and mortality are less than 3% (***NOTE:** *American College of Surgeons surgical risk calculator can be found at:* https://riskcalculator.facs.org/RiskCalculator/index.jsp) .

B. Symptomatic (eg, signs of a transient ischemic attack [TIA]) and **ALL** of the following: [15]

1. Anatomy is suitable for CEA.
2. Carotid stenosis is 50% or more and **NOT** a high surgical risk (eg, no contralateral carotid occlusion, no heart failure class III/IV, no previous CEA with recurrent stenosis, no prior radiation treatment to neck, no recent myocardial infarction and no unstable angina) for CEA. [8]
3. Maximum medical management is in place. [14]
4. Perioperative morbidity and mortality risk are less than 6%. [9]
5. Symptomatic event has occurred within the last 6 months (***NOTE:** *Do not send to physician review due to this indication, it can be approved under asymptomatic.*)[6]

## CEA Procedure Codes

**Table 1. Carotid Endarterectomy (CEA) Associated Procedure Codes**

| CODE | DESCRIPTION |
|---|---|
| 35301 | Thromboendarterectomy, including patch graft, if performed; carotid, vertebral, subclavian, by neck incision |

[5]Maximum medical management including: anti-platelet medications, lifestyle modifications (diet, exercise, weight management), lipid management (eg, diet, exercise, medications), optimal blood pressure control (less than 140/90 or 130/80 for CKD/DM, controlled with medication) and smoking cessation counseling

[6]When considering revascularization in ages 70 years or older with stroke or TIA, it may be reasonable to select CEA over CAS to reduce periprocedural stroke rate. [9]

## Summary of Changes

Carotid Revascularization: Stenting and Endarterectomy (CAS) & (CEA) clinical guidelines from 2022 to 2023 had the following version changes:

- CAS changes:
  - Added "6 months" as the time frame for recent
  - Added "Age, less than 70 years" to symptomatic
  - Asymptomatic indication section was added.
  - Risk calculator was added next to the first "Perioperative stroke/death rates are less than 3%" indication.
  - TCAR guideline was added.
- CEA changes:
  - Added "6 months" as the time frame for recent
  - Note placed next to "symptomatic event has occurred within the last 6 months" indication.
  - Risk calculator was added next to the first "Perioperative stroke/death rates are less than 3%" indication.

# Definitions/Key Terms

**Amarosis fugax (AF)** is a temporary, partial or complete loss of sight in one eye that is caused by an abrupt reduction in blood flow (ischemia) to the retina. AF is also known as transient monocular blindness and is associated with carotid artery disease (CAD).
**Atherosclerosis** is plaque (fatty deposit) build-up in the arteries. The deposits are made up of cholesterol, fatty substances, cellular waste products, calcium and fibrin (a clotting material in the blood). As plaque builds up, the wall of the blood vessel thickens. This narrows the channel within the artery reducing blood flow and lessening the amount of oxygen and other nutrients reaching the body.
**Carotid artery stenosis** is the narrowing of the blood vessels in the neck that carry blood from the heart to the brain. Typically caused by cholesterol build-up in the carotid blood vessels (atherosclerosis).
**Carotid artery stenting (CAS)** is an endovascular procedure where a stent is deployed within a lumen into the carotid artery to compress and secure plaque, increase cerebral blood flow and prevent a stroke. CAS is used to treat narrowing of the carotid artery in high-risk patients when carotid endarterectomy is considered too risky.

**Carotid endarterectomy (CEA)** is a surgical procedure in which the surgeon makes an incision along the front of the neck to open the carotid artery and removes the atherosclerotic plaque that is restricting the flow of blood.

**Table 1. New York Heart Association (NYHA) Functional Classification for Heart Failure**

| CLASS | SYMPTOMS EXPERIENCED |
|---|---|
| Class I (Mild) | Cardiac disease, but no symptoms and no limitation in ordinary physical activity (eg, shortness of breath when walking, climbing stairs). |
| Class II (Mild) | Mild symptoms (eg, mild shortness of breath and/or angina) and slight limitation during ordinary activity. |
| Class III (Moderate) | Marked limitation in activity due to symptoms, even during less-than-ordinary activity, (eg, walking short distances [20–100 m]). Comfortable only at rest. Class IIIa: no dyspnea at rest. Class IIIb: recent dyspnea at rest. |
| Class IV (Severe) | Severe limitations. Experience symptoms while at rest. Unable to carry on any physical activity without discomfort. |

**Severe pulmonary disease** is stage lll pulmonary disease. Symptoms may include getting colds more often, feeling tightness in the chest, swelling in the ankles and feet, trouble catching breath, and breathing issues on exertion.

**Stent** is a small, expandable, metal mesh tube used to keep open previously narrowed coronary arteries after angioplasty has been performed. The stent surrounding the inserted balloon expands when the balloon is inflated, locking the stent into place against the plaque/arterial vessel wall. The stent stays inside the artery after the balloon is deflated and removed.

**Transcarotid Artery Revascularization (TCAR)** is minimally invasive procedure to treat carotid artery disease and help prevent future strokes. TCAR is unique in that blood flow is temporarily reversed during the procedure so that any bits of plaque that may break off are diverted away from the brain.

**Transient ischemic attack (TIA)** is a brief interruption of the blood supply to the brain that causes a temporary impairment of vision, speech or movement. The episode usually lasts for just a few moments but may be a warning sign of a full scale stroke.

**Uncontrolled diabetes** is defined as having sustained high blood sugar levels (hyperglycemia) or frequent low blood sugars (hypoglycemia). For most adults with diabetes, uncontrolled diabetes is when your A1c is 7% or higher, according to the American Diabetes Association.

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