



Effective Health Care

Carotid Artery Stenting (CAS) versus Carotid Endarterectomy (CEA) for Carotid Artery Stenosis Nomination Summary Document

Results of Topic Selection Process & Next Steps

- The topic, *Carotid Artery Stenting (CAS) versus Carotid Endarterectomy (CEA) for Carotid Artery Stenosis*, was found to be addressed by a 2012 systematic review and an ongoing systematic review being conducted for the US Preventive Services Task Force (USPSTF). In addition, the topic is also addressed by a number of evidence-based clinical practice guidelines (CPGs). Given that existing guidelines and reports cover this nomination, no further activity will be undertaken on this topic.
 - Raman G, Kitsios GD, Moorthy D et al. Management of Asymptomatic Carotid Stenosis. Technology Assessment Report Project ID: CRDT0510. (Prepared by Tufts Evidence-based Practice Center under Contract No. 290 2007 10055 1). Rockville, MD: Agency for Healthcare Research and Quality, 2012.
 - US Preventive Services Task Force. Screening for Asymptomatic Carotid Artery Stenosis: Final Research Plan. AHRQ Publication No. 13-05178-EF-4. To view a description and status of the research review, please go to:
<http://www.uspreventiveservicestaskforce.org/uspstf13/cas/casfinalresplan.htm>.
 - To sign up for notification when this and other USPSTF topics are posted, please go to:
<http://www.ahrq.gov/clinic/prevenix.htm>.
 - Lim LS, Haq N, Mahmood S, Hoeksema L, ACPM Prevention Practice Committee, American College of Preventive Medicine. Atherosclerotic cardiovascular disease screening in adults: American College of Preventive Medicine position statement on preventive practice. *Am J Prev Med.* 2011;40(3):381.e1-10.
 - American Medical Directors Association (AMDA). Stroke management in the long-term care setting. Columbia (MD): American Medical Directors Association (AMDA); 2011. Information on this guideline can be found at: <http://www.guideline.gov/content.aspx?id=32670>
 - Adams RJ, Albers G, Alberts MJ et al., American Heart Association (AHA), American Stroke Association(ASA). Update to the AHA/ASA recommendations for the prevention of stroke in patients with stroke and transient ischemic attack. *Stroke.* 2008;39(5):1647-52.

Topic Description

Nominator(s): Organization

Nomination Summary: Carotid artery stenting (CAS) is a newer percutaneous procedure than carotid endarterectomy (CEA). Controversy remains among clinical groups and policymakers as to optimal patient selection for CAS vs. CEA. A comparative effectiveness review of CAS versus CEA would help policymakers and clinicians weigh the benefits and risks of each procedure and help guide policy and coverage decisions, particularly for patients in

usual health care settings compared with those entering clinical trials.

Staff-Generated PICO

Population(s): Patients with carotid artery stenosis, carotid artery disease, or arteriosclerosis for which CAS or CEA is being considered (any age, gender, or with any existing co-morbidities), including both symptomatic patients and patients without symptoms but with stenosis of >50% of the internal carotid artery

Intervention(s): CEA

Comparator(s): CAS (endovascular treatment or repair)

Outcome(s): Hospital length of stays, recovery of activities of daily living, quality of life, complication rates, readmission rates, repeat surgeries, further disability and morbidity including ipsilateral (same side) and contralateral (opposite side) stroke and myocardial infarction (MI), mortality

Key Questions from Nominator:

1. What are the outcomes (effectiveness and harms) of CAS compared to CEA?
2. Are there patient subgroups that are likely to benefit more or less from CAS compared to CEA?
3. What are the costs of CAS compared to CEA?
4. What operator characteristics are associated with better outcomes for CEA and CAS?

Considerations

- The topic meets EHC Program appropriateness and importance criteria. (For more information, see <http://effectivehealthcare.ahrq.gov/index.cfm/submit-a-suggestion-for-research/how-are-research-topics-chosen/>.)
- More than 795,000 people in the US have a stroke each year. Plaque buildup in the carotid arteries is a common cause of carotid artery stenosis and increases the risk of stroke. Asymptomatic and symptomatic carotid artery stenosis can be treated with lifestyle changes, medication, and surgery. Surgical procedures include percutaneous transluminal balloon angioplasty with or without stent insertion and percutaneous endarterectomy.
- The topic was found to be addressed by a 2012 AHRQ technology assessment titled, *Management of Asymptomatic Carotid Stenosis*. Key questions from this report include:
 1. In asymptomatic patients with carotid artery stenosis, what is the evidence on long-term clinical outcomes (at least 12 months of follow-up) including stroke, death, myocardial infarction, and other cardiovascular events for the following interventions?
 - a. Medical therapy alone
 - b. CEA and medical therapy versus medical therapy alone
 - c. CAS and medical therapy versus medical therapy alone
 - d. CAS and medical therapy versus CEA and medical therapy
 2. Among comparative studies (CEA and medical therapy versus medical therapy alone, CAS and medical therapy versus medical therapy alone, CAS and medical therapy versus CEA and medical therapy), what is the impact of the following patient, intervention, and study characteristics on treatment effect?

- a. Demographic and other baseline features including the assessment the applicability of studies to patients ≥ 65 years with asymptomatic carotid artery stenosis, subgroup of patients ≥ 80 years, and sex
 - b. Clinical and anatomic features of carotid artery stenosis
 - c. Average or high risk for CEA due to comorbid diseases
 - d. Types of stents used and use of embolic protection devices
 - e. Concurrent and postoperative treatments
 - f. Length of follow-up
 - g. Methodological quality of studies
3. Among comparative studies (CEA and medical therapy versus medical therapy alone; CAS and medical therapy versus medical therapy alone; CAS and medical therapy versus CEA and medical therapy), what is the evidence on adverse events and complications during the periprocedural period?
- The topic was found to be addressed by an ongoing USPSTF review titled, *Screening for Asymptomatic Carotid Artery Stenosis*. There are 8 KQs guiding the update of which KQ5, KQ7 and KQ8 are most directly relevant to the topic nomination.
5. For people with asymptomatic CAS (defined as 60% to 99% stenosis), does intervention with CEA or carotid angioplasty and stenting (CAAS) provide incremental benefit beyond current standard medical therapy for reduction of fatal or nonfatal ipsilateral stroke?
- a. Is there incremental benefit for persons at decreased risk for ipsilateral stroke caused by CAS?
 - b. Is there incremental benefit for persons at average risk for ipsilateral stroke caused by CAS?
 - c. Is there incremental benefit for persons at increased risk for ipsilateral stroke caused by CAS?
 - d. Does the evidence differ for subgroups defined by age, sex, race, or ethnicity?
- 7a. What are the harms associated with CEA or CAAS for the treatment of asymptomatic CAS?
- 7b. Do the harms differ for subgroups defined by age, sex, race, or ethnicity?
- 7c. Do the harms differ for subgroups defined by comorbidities?
- 8a. What are the harms associated with CEA or CAAS for the treatment of asymptomatic CAS?
- 8b. Do the harms differ for subgroups defined by age, sex, race, or ethnicity?
- 8c. Do the harms differ for subgroups defined by comorbidities?
- In addition, an ARHQ report entitled *Geographic Variation in Carotid Endarterectomy and Carotid Stenting among Medicare Beneficiaries, 2003-2006* examined claims data from the Centers for Medicare & Medicaid Services (CMS) to determine the geographic variation in CEA and CAS and the predictors of the procedures.
 - Patel MR, Greiner MA, DiMartino LD et al. Geographic variation in carotid endarterectomy and carotid stenting among Medicare beneficiaries, 2003-2006. Effective Health Care Program Research Report No. 30. (Prepared by Duke University DEClDE Center under Contract No. HHS 290-2005-00321 TO2). Rockville, MD: Agency for Healthcare Research and Quality. 2010. Accessed August 12, 2013. <http://effectivehealthcare.ahrq.gov/reports/final.cfm>
 - Three CPGs published by the American College of Preventive Medicine) ACPM, the American Medical Directors' Association (AMDA), and the American Heart Association (AHA)/ American Stroke Association (ASA) also consider the treatment options for carotid artery stenosis to inform clinical decision-making.