
Carotid artery stenosis is a known stroke risk factor and a cardiovascular disease marker. No population-based screening trials for carotid artery stenosis have been conducted. Optimal treatment for clinically significant asymptomatic carotid artery stenosis remains uncertain. Options include best medical therapy alone or in combination with revascularization (carotid endarterectomy or carotid artery stenting) to prevent stroke. Revascularization has been associated with small long-term benefits compared with best medical therapy alone in historic trials but can result in surgical harms.1

Since 2007, the US Preventive Services Task Force (USPSTF) has maintained a D recommendation against screening for asymptomatic carotid artery stenosis in the general adult population. This recommendation was based on a low prevalence of stroke attributable to asymptomatic carotid artery stenosis in the general population, the small benefit of surgery compared with medical therapy in older trials, and the potential for small to moderate surgical harms. This brief evidence update aimed to identify studies published since the previous 2014 review1 to inform an updated USPSTF recommendation.

Methods | A literature search of MEDLINE, PubMed publisher-supplied records, and the Cochrane Central Register of Controlled Trials was conducted from January 1, 2014, to February 18, 2020. Ongoing surveillance in targeted publications was conducted through November 20, 2020. Two investigators independently evaluated articles that met inclusion criteria and summarized the data. The most recent comprehensive publication from each US national database or surgical registry reporting procedural harms was selected for review. The scope of this rapid review was limited to screening in the general population and did not address high-risk subpopulations. The results are limited to studies published since the previous review to support the 2014 recommendation.2 An analytic framework and 4 key questions (KQs) guided the evidence update (Figure). Detailed methods and results of this systematic review are available in the full evidence report.4

Figure. Analytic Framework: Screening for Asymptomatic Carotid Artery Stenosis in the General Population

Key questions

1. Is there direct evidence that screening asymptomatic adults for carotid artery stenosis with duplex ultrasonography improves health outcomes?
2. What are the harms associated with screening or confirmatory testing for asymptomatic carotid stenosis?
3. For asymptomatic persons with carotid artery stenosis, does revascularization provide incremental benefit beyond current medical treatment?
4. What are the harms associated with revascularization of asymptomatic carotid artery stenosis?

Evidence reviews for the US Preventive Services Task Force (USPSTF) use an analytic framework to visually display the key questions that the review will address to allow the USPSTF to evaluate the effectiveness and safety of a preventive service. The questions are depicted by linkages that relate to interventions and outcomes. Further details are available from the USPSTF procedure manual.3
Results | We screened 2373 titles and abstracts and 144 full-text articles. No eligible studies were identified that directly examined the benefits or harms of screening for asymptomatic carotid artery stenosis (KQ1, KQ2). Two limited, prematurely terminated trials reported mixed results for the comparative effectiveness of carotid revascularization plus best medical therapy compared with best medical therapy alone (KQ3). The SPACE-2 trial\(^4\) (n = 316) reported no significant difference in composite outcome of stroke or death (30 days) or ipsilateral ischemic stroke (1 year) after carotid endarterectomy (unadjusted hazard ratio [HR], 2.82 [95% CI, 0.33-24.07]) or carotid artery stenting (unadjusted HR, 3.50 [95% CI, 0.42-29.11]) compared with best medical therapy at 1 year. The smaller AMTEC trial\(^5\) (n = 55) reported a statistically significantly lower composite risk of nonfatal ipsilateral stroke or death among the carotid endarterectomy group at a median of 3.3 years (calculated unadjusted HR, 0.20 [95% CI, 0.06-0.65]). The 2 trials, 2 national data sets, and 3 surgical registries reported procedural harms associated with carotid endarterectomy (n = 1903 761) or carotid artery stenting (n = 332 103) (KQ4). These data estimated that postoperative 30-day rates of stroke or death varied from 1.4% to 3.5% for carotid endarterectomy and from 2.6% to 5.1% for carotid artery stenting.

Discussion | The conclusions of this review are consistent with those of the previous review (Table).\(^1\) There was no direct evidence examining the benefits or harms of screening. The 2 new trials added little to the evidence base on effectiveness of revascularization compared with best medical therapy. New evidence related to procedural harms from contemporary national databases and surgical registries reported complication rates; however, their selection and measurement biases remain serious concerns. The reported wide variation in complication rates may be attributable to patient and surgeon/operator selection.

While there were few new trials examining the comparative effectiveness of revascularization compared with contemporary best medical treatment alone, the ongoing CREST-2 (NCT02089217, estimated completion date of December 2022), ECST-2 (ISRCTN97744893, estimated completion date of March 2022), and ACTRIS (NCT02841098, estimated completion date of December 2025) trials will add to this treatment evidence base for asymptomatic carotid artery stenosis in the future.

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Editorial Disclaimer: This evidence report is presented as a document in support of the accompanying USPSTF recommendation statement. It did not undergo additional peer review after submission to JAMA.