



Choosing Wisely® Recommendation Analysis: Prioritizing Opportunities for Reducing Inappropriate Care

CAROTID ARTERY STENOSIS SCREENING IN ASYMPTOMATIC
PATIENTS

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CAROTID ARTERY STENOSIS SCREENING

Evidence Justification

American Academy of Family Physicians

Don't screen for carotid artery stenosis in asymptomatic adult patients.

The American Academy of Family Physicians recommends against carotid artery disease screening in asymptomatic patients. We summarize the reasoning provided by this society to justify the inclusion of this service, including assignment of this service into one of five evidentiary categories of “wasteful” services arising from the evidence on benefits, risks, and costs (Gliwa, 2014).

Specialty Society Rationale

Carotid artery stenosis (CAS) is the narrowing of internal carotid arteries, which limits blood flow to the brain. CAS is a risk factor for stroke, one of the leading causes of mortality and disability in the United States. Screening for CAS is commonly performed using duplex ultrasonography to determine whether the arteries are blocked by plaque. Physicians may also screen for CAS by listening for abnormal sounds from the arteries (a “bruit”) with a stethoscope.

Multiple specialty society guidelines and the United States Preventive Services Task Force (USPSTF) recommend against the use of screening for CAS in asymptomatic patients (USPSTF, 2007; USPSTF, 2014; AAFP, 2014; American College of Cardiology/American Heart Association Task Force, 2011; American Stroke Association, 2010). Individuals with a history of stroke, transient ischemic attack, or other neurologic signs or symptoms may benefit from screening, but patients without symptoms for CAS are unlikely to derive clinical benefit from screening since CAS is so rare in the general population. Only 10% of strokes are caused by CAS, and the prevalence of CAS is only 1% among the asymptomatic population (Jonas et al., 2014).

Even when screening identifies carotid stenosis, the available interventions – endarterectomy or stenting – carry significant risk and may have limited benefit (Jonas et al., 2014). CAS screening in asymptomatic patients may also cause harm by increasing false-positive test results and

unnecessary follow-up testing that may cause patient anxiety and lead to unnecessary procedures like angiography that can cause serious physical harm, including stroke, heart attack, or death. The cost of CAS screening can vary significantly by provider, but duplex ultrasound generally costs around \$275 (healthcarebluebook.com)

Table 1. “Wasteful Care” Evidence Category

1. Insufficient evidence to evaluate comparative benefit for any indication
2. <i>Insufficient evidence to evaluate comparative benefit for use beyond the boundaries of established indications, frequency, intensity, or dosage</i>
3. Adequate evidence demonstrating equivalent benefit with higher risk, higher cost, or both
4. Adequate evidence demonstrating a small comparative benefit not large enough to justify the higher risk to patients, higher cost, or both
5. Adequate evidence demonstrating improved comparative benefit, lower risk, lower cost, or both when using the intervention

Source: Gliwa and Pearson, 2014

Current Use and Variation in Practice

- *Estimated Population Affected: 1.3 million – 1.6 million**
- *Excess Cost of Practice: \$274 million – \$323 million**

** Estimates are for the Medicare population only*

Source: Schwartz AL, Landon BE, Elshaug AG, et al., Measuring Low-Value Care in Medicare. *JAMA Intern Med.* 2014;174(7):1067-1076.

In spite of clear standards across specialty society guidelines on the appropriate use of screening for CAS, available data suggest that a significant number of asymptomatic patients continue to receive routine screening. A retrospective study of Medicare claims data from 2009 evaluating the prevalence of low-value services found that among a representative sample of 1.4 million beneficiaries between 68,000 and 81,600 (5% – 6%) received carotid imaging without symptoms or diagnosis of stroke or other serious cardiac conditions (Schwartz et al., 2014). The lower range excludes imaging performed in an inpatient or emergency setting. When these results are applied to the entire Medicare population, an estimated 1.3 million – 1.6 million asymptomatic patients undergo screening for carotid artery stenosis every year.

Other research has shown that rate of CAS screening is increasing in the Medicare population. Another retrospective analysis studied Medicare claims data between 2000 and 2007 among four different specialties to determine whether physicians who perform revascularization of carotid stenosis are more likely to provide carotid artery ultrasound screening. This study found that over 11 million CAS ultrasounds were performed by the four specialties analyzed during the six year study period, and that rates of utilization increased across all specialties (Zafar et al., 2012). The greatest increase in utilization was observed in cardiology (11% growth), followed by vascular surgery (6%) and interventional radiology (3%).

The costs of routine CAS screening can be significant. The Schwartz study found that annual Medicare spending on non-indicated preoperative stress testing ranged from \$274 million - \$323 million (2014). These estimates do not include any costs associated with follow-up care prompted by screening, so the potential for cost-savings from reducing overuse may be far higher.

Sociology of Practice

We performed a literature review and conducted unstructured interviews with national clinical experts representing the fields of cardiology, thoracic surgery, and radiology to understand the multi-faceted influences that drive the routine screening for CAS in the general population, as well as the most effective methods to reduce inappropriate use of this service. Key themes and lessons from the public literature and these conversations are summarized below.

Experts recognized several factors that drive screening for CAS in the asymptomatic population. First, fee-for-service (FFS) reimbursement continues to motivate clinicians to increase the volume of costly procedures delivered. Physicians interviewed noted that carotid artery ultrasound screening is among the most common vascular tests provided in many laboratories, and that ultrasonography machines are a fairly low cost purchase for the amount of profit they yield. Experts also suggested that specialties that perform revascularization procedures may be incentivized to self-refer, increasing the number of asymptomatic patients that receive screening.

In other cases, physician training and support may play a role. According to the experts interviewed, physicians are generally aware of the guidelines but often lack the full details of a patient's medical history to be able to definitively rule out prior history of stroke or other risk factors. Moreover, some primary care clinicians may not see as many cases of potential CAS so may be less familiar with clinical standards for when to order a test. Physicians advocated for more training and resources to support primary care and other internal medicine physicians in taking a comprehensive medical history to support decision-making for screening.

In other cases, a review of the literature reveals that internal medicine physicians sometimes use CAS screening to help manage potentially at-risk patients. Some primary care physicians have difficulty motivating patients with family histories of stroke to adhere to statin medications meant to control risk factors. Physicians will therefore sometimes screen asymptomatic patients for CAS as a means of convincing patients that they have a real "disease" and should adhere closely to all treatment recommendations (Fratt et al., 2012). Physicians feel that visual depictions of early carotid plaque can help nudge patients to take measures to control blood pressure and comply with aspirin or statin prescriptions, though some research has shown that patients with abnormal results on carotid ultrasonography are not more likely to adopt healthy behavior modifications (Rodondi et al., 2012).

Interviewees also referenced the problem of direct-to-consumer screening as a driver of wasteful care. Increasingly, private companies offer mobile screening in churches, malls, and other community settings. These companies directly advertise CAS screening to consumers without providing education on the potential harms of screening or informing patients that many of the tests provided may not be indicated. These mobile screening units allow anyone to purchase testing regardless of clinical indication and often overpromise the benefit of screening, particularly for asymptomatic adults.

Lastly, interviewees were mixed on the contribution of patient demand to overuse. Some physicians had very little experience with patients demanding CAS screening in office settings, while others noted significant concerns among patients about their risk of stroke that often led to screening for asymptomatic individuals. Given the relative low degree of patient harm in ultrasound, some physicians found it difficult to reject requests for screening and engage in a discussion of the potential downstream harms that for many patients seem abstract. Interviewees emphasized, however, that relative to other services on Choosing Wisely® lists, the potential downstream effects of CAS screening can be extremely dangerous and can lead to death in some cases, so talking points or other tools to help physicians engage patients in conversations about the risks are very important.

Though overuse of CAS screening remains a problem, physicians interviewed agreed that progress has been made in the past decade to reduce unnecessary care. Experts we spoke with believed that the growing use of global payment and other reimbursement mechanisms that move away from fee-for-service will help drive reductions in screening for CAS in asymptomatic populations. Unnecessary use of CAS screening is identifiable using existing claims codes, and some payers, including the U.S. Department of Veteran Affairs, do not provide coverage for vascular disease screening in patients without symptoms (Department of Veteran Affairs, 2009). Interviewees noted, however, that even in instances of non-coverage or preauthorization, that there are issues with how criteria are enforced implemented, and that more could be done by health plans to limit inappropriate use of CAS screening.

Summary Statement: Drivers of Overuse and Opportunities for Improvement

Based on our research and conversations with national experts, this section synthesizes the major factors related to overuse, as well as any opportunities for improvement or existing best practices for reducing wasteful care.

Factors Related to Overuse		
<i>Patient Factors</i>	<i>Physician Factors</i>	<i>Payer Factors</i>
<ul style="list-style-type: none"> • Direct-to-consumer commercial screening options that provide low-cost tests and often overpromise the benefits of screening without adequate information on potential risks • Patient concerns about risks for stroke that drive demand for screening 	<ul style="list-style-type: none"> • Financial incentives that reward the provision of costly procedures • Opportunity to profit from self-referrals • Lack of complete medical history to inform decision on screening • Motivation to provide screening to help convince patients to comply with medication or to more actively manage risks factors for stroke and heart disease 	<ul style="list-style-type: none"> • Payment models that reward volume of services • Lack of systems to deny payment for patients who are asymptomatic
Opportunities for Improvement/Current Best Practices		
Opportunities for Improvement	Current Best Practices	
<ul style="list-style-type: none"> • Make greater use of global payment arrangements that reduce incentives to over-test patients • Provide further resources to support physicians in taking comprehensive history to inform screening decisions • Develop talking points and other support tools for physicians to explain risks of screening for asymptomatic patients 	<ul style="list-style-type: none"> • Coverage criteria from some payers like the VA that restrict access to screening for asymptomatic patients 	

Summary Rating

This section synthesizes the information provided previously and presents a recommended priority ranking of whether this service is likely to represent the best opportunity for policy makers to improve practice and drive change. These rankings are based on considerations of 5 factors illustrated in the table below.

Criteria	Ranking
<i>Level of overuse</i>	★ = Limited overuse ★ ★ = Moderate overuse ★ ★ ★ = Substantial overuse
<i>Magnitude of individual patient harm</i>	★ = Limited harm ★ ★ = Moderate harm ★ ★ ★ = Substantial harm
<i>Ease of overcoming patient, clinician, and system barriers to reduce inappropriate care</i>	★ = Limited ease ★ ★ = Moderate ease ★ ★ ★ = Substantial ease
<i>Potential to leverage existing change programs and policy efforts</i>	★ = Limited potential ★ ★ = Moderate potential ★ ★ ★ = Substantial potential
<i>Amount of potential savings</i>	★ = Limited savings ★ ★ = Moderate savings ★ ★ ★ = Substantial savings

<i>Category</i>	<i>Score</i>	<i>Rationale</i>
<i>Level of overuse</i>	★★★	<ul style="list-style-type: none"> Determined to be a significant level of overuse according to multiple studies comparing areas of low value care among Medicare beneficiaries
<i>Magnitude of individual patient harm</i>	★★★	<ul style="list-style-type: none"> Can lead to follow-up testing that may cause patient anxiety and lead to unnecessary procedures like angiography, which can cause serious physical harm, including stroke, heart attack, or death
<i>Ease of overcoming patient, clinician, and system barriers to reduce inappropriate care</i>	★★	<ul style="list-style-type: none"> Financial incentives will gradually diminish or disappear as reimbursement systems become more value-based Algorithms available to identify overuse and outliers Many payer policies already restrict access
<i>Opportunity to leverage existing change programs and policy efforts</i>	★★★	<ul style="list-style-type: none"> Agreement across clinical specialty guidelines and the USPSTF, indicating opportunities for greater collaboration and dissemination of education efforts
<i>Amount of potential savings</i>	★★	<ul style="list-style-type: none"> Tests are moderately expensive, and eligible patient population is significant

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