



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

PREOPERATIVE STRESS TESTING

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Evidence Justification

Seven specialty societies recommend against the use of preoperative stress testing in patients scheduled to undergo low- and/or intermediate-risk non-cardiac surgery. We summarize the reasoning provided by these societies 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).

American College of Cardiology

Don't perform stress cardiac imaging or advanced non-invasive imaging as a pre-operative assessment in patients scheduled to undergo low-risk non-cardiac surgery.

American Society of Anesthesiologists

Don't obtain baseline diagnostic cardiac testing (trans-thoracic/ esophageal echocardiography – TTE/TEE) or cardiac stress testing in asymptomatic stable patients with known cardiac disease (e.g., CAD, valvular disease) undergoing low or moderate risk non-cardiac surgery.

American Society for Nuclear Cardiology

Don't perform cardiac imaging as a pre-operative assessment in patients scheduled to undergo low- or intermediate-risk non-cardiac surgery.

Society for Cardiovascular Magnetic Resonance

Don't perform stress cardiovascular magnetic resonance imaging as a pre-operative assessment in patients scheduled to undergo low-risk, non-cardiac surgery.

Society of General Internal Medicine

Don't perform routine pre-operative testing before low-risk surgical procedures.

The Society for Thoracic Surgeons

Patients who have no cardiac history and good functional status do not require preoperative stress testing prior to non-cardiac thoracic surgery.

Society for Vascular Medicine

Avoid cardiovascular testing for patients undergoing low-risk surgery.

Specialty Society Rationale

Noninvasive cardiac stress tests such as stress echocardiography, radionuclide myocardial perfusion imaging, and exercise/treadmill tests are used to assess a patient’s perioperative risk for major adverse cardiac events. Specialty society guidelines are nuanced in their recommendations for when preoperative cardiac evaluation should be performed, but in general state that testing may only be necessary for patients undergoing low-risk procedures if they have a serious cardiac condition or symptoms. Testing for patients receiving high- or intermediate-risk procedures may be necessary if they have certain risk factors, known cardiovascular disease, and limited cardiac functional capacity (Fleisher et al., 2014; Consumer Reports and American Society of Nuclear Cardiology, 2012).

Patients undergoing low-risk, non-cardiac surgery who do not have serious cardiac conditions receive no material clinical benefit from preoperative testing. Since the risk of major cardiac complications from non-cardiac procedures is so low, the results of the test are unlikely to affect clinical management (Fleisher et al., 2014). Preoperative stress imaging may also increase chances for false-positive test results and unnecessary follow-up testing that cause patient anxiety and may delay surgery. The cost of preoperative stress testing can also be significant.

Table 1. “Wasteful Care” Evidence Category

1. Insufficient evidence to evaluate comparative benefit for any indication
2. Insufficient evidence to evaluate comparative benefit for use beyond the boundaries of established indications, frequency, intensity, or dosage
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: 82,000– 191,000**
- *Excess Cost of Practice: \$81 million – \$180 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 general agreement across clinical specialty society guidelines on the appropriate use of preoperative evaluation, available data suggest that stress testing for low- and/or intermediate-risk non-cardiac surgery is an area of overuse, though estimates from the published literature vary significantly. One study using Medicare claims data from 1996 to 2008 found that among 74,785 beneficiaries with no diagnosis of a serious cardiac condition undergoing a low-to-intermediate-risk surgical, urologic, or orthopedic procedure, approximately 3,000 (4%) received a non-indicated preoperative stress test (Sheffield, et al., 2013). A retrospective study of 2009 Medicare claims data evaluating the prevalence of low-value services found that among a representative sample of approximately 1.4 million beneficiaries, between 4,000 and 9,500 (0.3% – 0.7%) of all individuals had pre-operative stress testing before low- or intermediate-risk non-cardiac surgeries (Schwartz, et al., 2014). The lower range excludes stress testing performed as part of inpatient or emergency care. When these results are applied to the entire Medicare population, an estimated 82,000 – 191,000 patients nationally were estimated to have received unnecessary preoperative stress testing.

Some studies have found higher estimates of overuse, including another retrospective analysis using Medicare claims data between 2006 and 2011 that found that among 300,000 eligible beneficiaries undergoing low-risk, non-cardiac surgery, approximately 50% received non-indicated preoperative stress testing (Colla, et al., 2014).

The costs of non-indicated preoperative stress testing can be significant. The Schwartz study estimated that annual Medicare spending on non-indicated preoperative stress testing ranged from \$81 million - \$180 million. These estimates do not include any costs associated with follow-up care prompted by preoperative testing, so the potential for cost-savings from reducing overuse may be higher.

Sociology of Practice

We conducted unstructured interviews with national clinical experts representing the fields of cardiology, thoracic surgery, and anesthesiology to understand the multi-faceted influences that drive the use of the preoperative stress testing for low-risk non-cardiac procedures, as well as the most effective methods to reduce inappropriate use of these services. Key themes and lessons from these conversations are summarized below.

Experts noted that several factors conspire to make preoperative stress testing for low- and intermediate-risk non-cardiac surgeries an area of overuse. First, fee-for-service (FFS) reimbursement continues to motivate clinicians to increase the volume of costly procedures delivered. One physician mentioned that internal discussions at hospitals have emphasized increasing preoperative cardiac evaluations as a means of balancing budgets. Moreover, physicians often have little incentive to cancel testing once scheduled. For example, under fee-for-service payment, if a patient is referred to a cardiologist for stress testing and the cardiologist decides that it is unnecessary, the cardiologist will lose money as he or she now has a patient slot for which there will be no reimbursement.

Second, referral protocols in some practices have not caught up with evidence standards. For example, some institutions automatically refer every patient receiving surgery to an internist or cardiologist for preoperative evaluation and written clearance that the surgery can be performed safely. Experts noted that the challenge of reducing unnecessary testing when the greatest source of referral for some practice groups comes from external community health centers that may have different referral protocols and are not held to the same quality improvement standards. Physicians interviewed advocated for referral systems that first send an initial evaluation form to a cardiologist for a determination of risk and assessment of whether and what kind of further evaluation is needed before surgery.

Physician education also plays a role in sustaining overuse of this test. According to the experts interviewed, anesthesiologists, primary care physicians, and surgeons are the most common source of referral for preoperative testing, and these physicians may not fully appreciate that preoperative stress testing will not reduce risk or lead to any change in care for low-risk non-cardiac procedures. Experts recognized the challenge of keeping abreast with changing clinical

guidelines and noted that more efforts are needed at the clinical system leadership level to disseminate, implement, and build accountability around changing standards for practice.

Concerns for liability are another major driver of overuse in this area. Anesthesiologists, surgeons, and other physicians are motivated to refer for preoperative testing because it demonstrates prudence and provides protection against legal liability. Cardiologists acknowledged that even in instances where it is clear that preoperative evaluation is not indicated, they fear canceling a test and being held fully accountable for cardiac events, no matter how rare, that may arise during and after surgery. According to the experts interviewed, liability concerns can be somewhat mitigated in network practice environments where the physicians who refer for testing and those who perform the tests have a working relationship and established trust to review clinical considerations before tests are ordered. These relationships are less common in practice centers where referrals are made primarily from external institutions.

Experts also noted the role of hospital stewardship over clinical issues such as this that span several specialty groups. Physicians noted the important role that hospital Chief Medical Officers can play in prioritizing quality improvement initiatives that bring clinicians from multiple specialties together with administrative leadership to address cross-cutting issues. Physicians interviewed stressed how hospital leadership helps bring everyone on board and holds physicians accountable for performing appropriate care, particularly in accountable care organization (ACO) environments.

Lastly, though patient demand is not a major driver of overuse in this area, experts noted that it can still be a factor. Patients are inconvenienced and unsatisfied when previously scheduled stress tests are canceled during an appointment, and lack understanding that results from preoperative testing will not change patient management in any meaningful way and can cause harm by delaying necessary surgery. To address this issue, Consumer Reports®, in partnership with the ABIM Foundation as part of the Choosing Wisely® campaign, has created a range of consumer resources to help frame patient conversations with physicians about preoperative stress testing.

Though overuse of preoperative testing 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 growing use of global payment and other reimbursement mechanisms that move away from fee-for-service will help improve further the chances of reducing the overuse of preoperative stress testing for non-cardiac procedures. Experts also noted that health insurer

policies commonly utilize preauthorization policies for noninvasive imaging tests that help curb overuse. Several large health plans, including Aetna and Wellpoint, require preauthorization for outpatient elective echocardiography, and other insurers have instituted preauthorization policies for all outpatient imaging procedures, including nuclear cardiology and stress echocardiography (American College of Cardiology, 2010).

Health plans in some regions are also requiring physicians to apply clinical appropriate use criteria to decision-making to ensure certain imaging tests are only used when necessary. Starting in 2011, the Delaware Insurance Commissioner mandated that Blue Cross Blue Shield of Delaware automatically cover tests ordered by cardiologists utilizing the [American College of Cardiology's FOCUS: Cardiovascular Imaging Strategies tool](#) to ensure that appropriateness criteria are applied when ordering cardiovascular testing, including cardiac magnetic resonance imaging and echocardiography (Fidei, 2012). This program provides point-of-decision support for physicians, reporting to provider organizations and health plans on patterns of appropriate use, as well as follow-up education to outlier practices not adhering to criteria (ACC, 2011b). Though designed as a model for all states, so far the program has been limited to Delaware, where it was first established following a law suit and investigation into the denial of imaging tests by local health insurers (ACC, 2011a). In Delaware, this program replaces preauthorization requirements for imaging tests. Experts emphasized, however, that under current reimbursement models most savings are realized by the health plans, and practice groups shoulder the full financial burden for cutting costs. Physicians encouraged the use of shared savings reimbursement schemes, bonuses for applying appropriateness criteria, or accreditation programs that tier practices on quality to help level incentives between health plans and clinicians.

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"> • Patient inconvenience and dissatisfaction when tests are cancelled during already scheduled appointments 	<ul style="list-style-type: none"> • Financial incentives that reward the provision of costly procedures • Automatic referrals for preoperative testing without indication • Lack of knowledge of some referring physicians that preoperative tests for low-risk, non-cardiac procedures produce no clinical benefits • Concerns for liability from both ordering and referring physicians 	<ul style="list-style-type: none"> • Payment models that reward volume of services
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 training to referring and ordering physicians on the risks of over testing, emphasizing that preoperative stress testing for low-risk non-cardiac procedures is unlikely to alter clinical management in any meaningful way • Utilize hospital leadership to lead quality improvement campaigns and develop strategies for implementing standards and holding physicians accountable to those standards • Explore options for tort reform that reduce physician’s liability for applying appropriate clinical criteria 	<ul style="list-style-type: none"> • Collaboration with health plans to incentivize the use of online decision tools that support the use of appropriateness criteria and provide feedback on patterns of overuse 	

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 potentially delay necessary surgery, and lead to downstream testing, some of which may be invasive
<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 • Diagnostic codes available to identify unnecessary use with existing billing codes • Payer policies already limit unindicated use • Overcoming liability concerns would require a transformation of the tort system, which is highly unlikely
<i>Opportunity to leverage existing change programs and policy efforts</i>	★★★	<ul style="list-style-type: none"> • Unnecessary preoperative testing is a recommendation included on several clinical society Choosing Wisely® lists, signaling consensus and opportunities for further collaboration and education in this area
<i>Amount of potential savings</i>	★★★	<ul style="list-style-type: none"> • Tests are costly, and eligible patient population is significant

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