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Stress Testing Before Low-Risk Surgery: So Many Recommendations, So Little Overuse

Eve A. Kerr, MD, MPH[1,2], **Jersey Chen, MD**[3], **Jeremy B. Sussman, MD, MS**[1,2], **Mandi L. Klamerus, MPH**[1], and **Brahmajee K. Nallamothu, MD, MPH**[1,2]

[1]Veterans Affairs Center for Clinical Management Research, HSR&D Center for Innovation, Ann Arbor, MI

[2]Department of Internal Medicine, University of Michigan, Ann Arbor, MI

[3]Kaiser Permanente, Mid-Atlantic Permanente Research Institute, Rockville, MD

To the Editor

The Choosing Wisely (CW) campaign, which commenced in 2011, focuses on reducing medical services that are of questionable value or may be harmful.[1] In 1996 and 2002, guidelines from the American College of Cardiology and the American Heart Association implied that routine stress testing prior to low-risk surgeries should be avoided; this was codified in the 2007 guidelines because the risk of cardiac complications from these surgeries is very low.[2] Consequently, seven specialty societies for the CW campaign now recommend not performing cardiac stress testing prior to low-risk surgery.[3] Recently, Thilen documented that the rate of pre-operative consultation for cataract surgery in 2006 approached 20% among Medicare patients, but did not comment on the use of stress testing.[4] Therefore, we sought to determine the prevalence of cardiac stress testing prior to low-risk surgeries, before the CW campaign commenced, to estimate the potential impact of the recommendations on future resource use. We examined pre-operative stress testing utilization in the two largest U.S. federally-sponsored healthcare programs: the Department of Veterans Affairs (VA) and fee-for-service Medicare.

Methods

We performed a retrospective cohort study using data from VA's Corporate Data Warehouse and from a nationally representative 5% sample of Medicare fee-for-service claims. Using Current Procedural Terminology codes, we identified all asymptomatic patients age ≥65 years who underwent one or more cataract surgeries, knee arthroscopies, or shoulder arthroscopies from February-December 2009. Then, using an approach similar to Schwartz,

Contact Information for the Corresponding Author (Eve Kerr, MD, MPH) Address: UM NCRC, Department of Veterans Affairs, 2800 Plymouth Rd, Building 16-328W, Ann Arbor, MI 48109, ekerr@umich.edu, Phone: 734-845-3504, Fax: 734-222-7503.

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we examined the proportion of these patients who had an exercise or pharmacologic ECG-treadmill, echocardiographic or nuclear stress test in the 28-day period prior to their first low-risk surgery.[5] To isolate routine pre-operative stress tests, we excluded stress tests in the preoperative period that also occurred 0-30 days after a hospitalization or 0-3 days after an emergency room visit. We also examined a more “sensitive” measure without such exclusions. To assess regional variation, we estimated stress test rates by hospital referral region (HRR) using 2-level empty logit models. The Ann Arbor VA Human Studies Committee and the Kaiser Permanente of the Mid-Atlantic States institutional review board approved this study.

Results

22,670 VA patients and 109,270 Medicare patients had a cataract surgery, knee arthroscopy, or shoulder arthroscopy from February-December 2009. The average age of patients was 75.5 in VA and 75.8 in Medicare (Table 1). A routine pre-operative stress test preceded one of the three low-risk surgeries in only 0.67% of VA patients and 2.14% Medicare patients (Table 2). Estimated stress test rates by HRR ranged in VA from 0.32% to 2.02% (interquartile range (IQR): 0.44% to 0.74%) and in Medicare from 1.49% to 3.14% (IQR: 1.77% to 2.11%). Applying the more sensitive measure, 0.76% of VA patients and 2.40% of Medicare patients had stress-testing prior to surgery.

Discussion

We found that the use of routine pre-operative stress testing prior to low-risk surgery in both VA and Medicare was very low and varied little across regions, even before the CW campaign started. Although rates in Medicare were three times as high as those in VA, these low absolute numbers suggest interventions to further decrease use would minimally improve quality (while diverting attention away from higher-yield interventions that would more strongly affect care). It appears that the vast majority of physicians had already incorporated into their practices guidelines about appropriate pre-operative stress testing before the CW recommendations. While this is good news for patients, it is not helpful for a campaign that aims to improve appropriateness.[6] Specialty societies should focus future CW recommendations on services that have high baseline rates of inappropriate care in order to call attention to areas where interventions can best improve quality.

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Table 1

Characteristics of patients having a low-risk surgery (arthroscopy[1,2] or cataract surgery[3]) between February 2009 and December 2009

Characteristic	VA (N=22,670)	Had a Stress Test (N=151)	Medicare (N=109,270)	Had a Stress Test (N=2,358)
Age as of 1/1/2009, mean (sd), years	75.5 (6.7)	73.8 (5.9)	75.8 (6.2)	75.3 (5.9)
Male, N (%)	22,137 (97.6%)	146 (96.7%)	51,347 (47.0%)	1,290 (54.7%)
Diagnosis of CV risk factors[4] in 2009, N (%)				
Coronary artery disease	7,887 (34.8%)	89 (58.9%)	63,155 (57.8%)	1,964 (83.3%)
Ischemic stroke or TIA	1,718 (7.6%)	15 (9.9%)	5,559 (5.1%)	131 (5.6%)
Hyperlipidemia	14,827 (65.4%)	114 (75.5%)	86,323 (79.0%)	2,071 (87.8%)
Heart failure	2,699 (11.9%)	32 (21.2%)	21,737 (19.9%)	537 (22.8%)
Cardiac arrhythmias	4,341 (19.1%)	43 (28.5%)	34,592 (31.7%)	826 (35.0%)
Peripheral vascular disease	3,381 (14.9%)	26 (17.2%)	25,346 (23.2%)	669 (28.4%)
Hypertension	17,954 (79.2%)	127 (84.1%)	93,585 (85.6%)	2,136 (90.6%)
Diabetes	9,666 (42.6%)	80 (53.0%)	42,657 (39.0%)	1,012 (42.9%)
Renal failure	3,061 (13.5%)	26 (17.2%)	14,853 (13.6%)	320 (13.6%)
Obesity	3,180 (14.0%)	38 (25.2%)	7,119 (6.5%)	148 (6.3%)

[1] Knee arthroscopy (29866-29868, 29870, 29873-29877, 29879-29889)

[2] Shoulder arthroscopy (29805-29807, 29819-29828)

[3] Cataract surgery (66982, 66984)

[4] Co-morbidities identified using Elixhauser coding criteria

Table 2

Proportion of patients having a stress test[1] prior to a low-risk surgery[2-4] between January 2009 and December 2009

	VA	Medicare
Arthroscopy (knee[2] or shoulder[3])	17/1,091 (1.56%)	703/16,079 (4.37%)
Cataract surgery[4]	134/21,606 (0.62%)	1,657/93,987 (1.76%)
Both combined[5]	151/22,697 (0.67%)	2,360/110,066 (2.14%)

[1] Stress test (75559, 75560, 75563, 75564, 78451-78454 78460, 78461, 78464, 78465, 78472, 78473, 78481, 78483, 78491, 78492, 93015-93018, 93350-93352, C8928, C8930)

[2] Knee arthroscopy (29866-29868, 29870, 29873-29877, 29879-29889)

[3] Shoulder arthroscopy (29805-29807, 29819-29828)

[4] Cataract surgery (66982, 66984)

[5] N is larger than in table 1 because some patients had both surgeries