Routine testing with biomarkers and imaging to detect recurrence in asymptomatic survivors of early-stage breast cancer who have finished curative treatment is not recommended in evidence-based guidelines. In fact, as part of the Choosing Wisely campaign, it is on the American Society of Clinical Oncology’s 2012 top 5 list of practices to avoid.

Multiple randomized trials have shown that routine biomarker testing and imaging do not increase survival or quality of life in asymptomatic survivors of breast cancer and may even be detrimental due to increased radiation exposure, false-positive findings, and heightened patient anxiety. Nevertheless, multiple studies have shown that overuse of these routine tests is common. Researchers set out to explore both the prevalence of testing within an integrated health care system, in which incentives to perform such low-value testing may be muted, and the reasons for testing (Cancer 2016;122:908-916).

Erin E. Hahn, PhD, MPH, research scientist in the department of research and evaluation at Kaiser Permanente of Southern California in Pasadena, and her colleagues identified 6585 female patients with stage 0 to stage II breast cancer who were diagnosed between January 1, 2009 and December 31, 2010 in the records from 2 integrated health care systems: Kaiser Permanente (KP) and Intermountain Healthcare (IH), which is based in Salt Lake City, Utah. KP is a capitated health plan and IH uses a mix of fee-for-service and capitated insurance models. Patients with a prior history of other cancers and those who did not undergo definitive breast cancer surgery were excluded. Approximately 44% of patients had stage I disease, 34% had stage II disease, and 22% had stage 0 disease.

Study Results
Overall, 24% of patients underwent at least 1 imaging test and test use increased by stage of disease: 17% of patients with stage 0 disease, 23% of patients with stage I disease, and 30% of patients with stage II disease. Approximately 28% of patients had at least 1 biomarker blood test with increasing use also noted with higher stages of disease: 10% of patients with stage 0 disease, 31% of patients with stage I disease, and 37% of patients with stage II disease.

Significantly more testing was observed in the KP system than in the IH system: 25% of patients at KP

KEY POINTS
- Many clinicians are still using low-value routine surveillance imaging or biomarker testing in asymptomatic survivors of breast cancer.
- An imaging test for patients with early-stage breast cancer after primary treatment was usually performed because of a symptom or clinical finding; however, almost all biomarker testing in this setting was performed as routine surveillance.
- Quality reporting must include the reasons behind posttreatment testing to avoid categorizing a test done to evaluate a sign or symptom as inappropriate surveillance.
underwent imaging compared with 22% at IH and 36% of patients at KP underwent biomarker testing compared with 13% at IH. The researchers abstracted the medical records of 110 patients (9%) who underwent imaging. In this group, 84% of the imaging tests performed were categorized as diagnostic (ie, performed to evaluate a sign or symptom such as pain or a palpable nodule or lymph node) and not just as a routine test. This was not the case for biomarker testing. An analysis of the 45 records abstracted to investigate biomarker testing revealed that 98% of these tests were performed for routine surveillance without any documented sign or symptom suggesting possible recurrence.

The majority of biomarker tests were performed at KP (6577 of 7322 tests; 90%); therefore, the data from KP were analyzed to examine predictors of biomarker testing. A large variation between different KP medical centers was observed, ranging from 12% to 67% of patients. The majority of tests (86%) were ordered by medical oncologists. It is interesting to note that provider years of experience since medical school graduation also were found to be significantly associated with biomarker use. The further away from medical school, the more likely the provider was to order biomarker tests.

On multivariate analysis, for every additional biomarker test performed, patients were 1.45 times as likely to receive another test compared with those not tested. Patients with stage I breast cancer were 4 times as likely and patients with stage II disease were 5 times as likely to undergo biomarker testing compared with patients with stage 0 disease. “Our study shows that many clinicians are still relying on low-value tests for posttreatment surveillance of early-stage breast cancer, particularly biomarker tests. It appears that use of these tests is lower in integrated systems than what has been reported from academic and other community settings. While the integrated nature of these systems may help to minimize use of low-value cancer care services, it is clear that there is still significant variation in use between, and within, the 2 systems,” says Dr. Hahn.

“I think this was a well-done study. Including stage 0 patients might be considered a problem—but I thought it was interesting that even 10% of these patients were screened with biomarkers. I would have predicted otherwise and would have thought that including stage 0 might skew the results in the other direction,” says Carolyn D. Runowicz, MD, executive associate dean for academic affairs and professor of obstetrics and gynecology at the Herbert Wertheim College of Medicine at Florida International University in Miami. Dr. Runowicz is the lead author of the recently published “American Cancer Society/American Society of Clinical Oncology Breast Cancer Survivorship Care Guideline” (CA Cancer J Clin. 2016;66:43-73), which states that “…routine testing with breast cancer tumor markers or imaging studies (eg, bone scan, chest x-ray, positron emission tomography-computed tomography [CT] scans, MRI [magnetic resonance imaging] scans, biomarkers) should not be performed for screening purposes, because they have not been shown to improve survival outcomes or QoL [quality of life] in asymptomatic patients.”

Clinical Context

The authors state that the use of imaging and biomarker tests in the current study was considerably less than that documented in other studies, in which estimates of routine posttreatment imaging ranged from 40% to 55%, and rates of biomarker testing varied from 37% to 77%. The evaluation of reasons for testing is unique to the current study. “We conducted chart reviews of posttreatment, early-stage breast cancer patients who received nonrecommended imaging or biomarker tests. For the vast majority of patients who received an imaging test, we found a clinician note documenting the reason for the test. In stark contrast, use of biomarker tests was almost entirely for nonrecommended surveillance, without documentation of reason for use,” says Dr. Hahn.

This is important, because the recommendations against routine testing apply to asymptomatic patients only. Therefore, the authors conclude that in quality reports examining guideline adherence, the clinical setting must be considered and such reports should not rely solely on structured data from electronic medical records.

Dr. Runowicz says she believes that these results are clinically relevant because health care providers increasingly need to include quality of care and cost in determining treatment, diagnostic, and follow-up testing. “I believe that surveillance biomarkers and/or imaging are still embedded practices which will take time to change. Education is vital and newer trainees should be expected to follow more evidenced-based medicine and guidelines,” she says.

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