

# Electronic prompt for surgeons may reduce breast cancer overtreatment

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University of Pittsburgh and UPMC Hillman Cancer Center researchers have developed a novel prompt, or 'nudge' embedded in the electronic health record that flags, for treating surgeons, older patients with early-

stage breast cancer who may be at risk for unnecessary lymph node surgery.

In a paper published in [JAMA Surgery](#), the team found that the rate of a surgical procedure called [sentinel lymph node biopsy](#) (SLNB) was almost halved among eligible patients after implementing the nudge, suggesting that this simple reminder could reduce overtreatment of older patients with breast cancer.

"In breast cancer, there is a growing movement toward precisely treating each individual patient, what we call right-sized care," said senior author Priscilla McAuliffe, M.D., Ph.D., associate professor of surgery at Pitt and breast surgical oncologist at UPMC Hillman and UPMC Magee-Womens Hospital.

"SLNB helps us determine if breast cancer has spread to the underarm lymph nodes, but it's not necessary for every patient. The simple, user-friendly nudge provides a timely reminder to surgeons to consider the value of SLNB for each patient."

One of the American Board of Internal Medicine Choosing Wisely recommendations, adopted by the Society of Surgical Oncology, advocates against routine SLNB for patients aged 70 and over with early-stage estrogen-receptor positive breast cancer due to the low risk of metastasis and favorable tumor biology. Yet most women in this population still undergo the procedure even though it does not provide critical treatment-guiding information, is not associated with a survival benefit and may have side-effects.

"Patients who undergo SLNB are at risk of developing a serious complication called lymphedema, a permanent but treatable swelling of the arm or breast that can greatly impact quality of life," said first author Neil Carleton, Ph.D., a student in Pitt's Medical Scientist Training

Program.

"As patients get older, they also have more challenges recovering from surgery and anesthesia, so if a patient isn't likely to benefit from SLNB, we want to avoid it whenever possible."

McAuliffe, Carleton and their multidisciplinary team, including Adrian Lee, Ph.D. of the Institute of Precision Medicine, and Tom Radomski, M.D. and Gary Fischer, M.D. of the Division of General Internal Medicine at Pitt, developed and evaluated the electronic health record nudge that reminds surgeons to consider the value of SLNB in patients who are flagged as potentially eligible to forgo the surgery based on their age and tumor biology.

To test the effectiveness of their approach, the researchers launched a non-randomized clinical trial with seven surgeons who worked across eight surgical oncology clinics that are part of Magee-Womens Breast Cancer Program and UPMC Hillman.

The surgeons performed SLNB in 46.9% of eligible patients throughout the 12-month period before the nudge was launched and in just 23.8% of eligible patients during the 12-month intervention period. That's a 49.3% reduction. And during an additional six-month follow-up period, the rate dropped further to 15.6%.

Participating surgeons rated the nudge as highly acceptable, appropriate and feasible in surveys completed after the 12-month intervention period. According to McAuliffe, surgeons appreciated that the prompt didn't require additional clicks or paperwork and integrated easily into their workflow.

The researchers also analyzed patient records for language that may indicate lymphedema symptoms by using artificial intelligence

technology developed by Realyze Intelligence, a UPMC Enterprises portfolio company. The rate of patients who experienced symptoms worthy of a referral for a lymphedema evaluation decreased from 6.2% to 3.6% after the nudge was implemented.

"Our findings suggest that fewer lymph node surgeries resulting from the nudge will help reduce rates of lymphedema, but we need longer follow-up to be certain because this condition can take several years to appear," explained Carleton.

Now, the researchers plan to roll out the nudge to UPMC doctors beyond the Magee breast [surgical team](#) in the hopes that it will improve care for more patients across the system, including those seen in community settings who are often excluded from clinical trials.

This research is an important step in the team's overall goal of improving individualized care for [breast cancer patients](#) and reducing overtreatment. In a recent *JCO Clinical Cancer Informatics* [study](#), the researchers found evidence that the recommendation against routine use of SLNB for [older patients](#) with [early-stage breast cancer](#) could be extended to post-menopausal women aged over 55.

In addition to its use in this study, Realyze Intelligence's AI technology is already being successfully used at UPMC Hillman Cancer Center to match patients to [clinical trials](#) for which it is recruiting.

**More information:** EHR-Based Nudge Intervention to Reduce Low-Value Axillary Surgery in Older Women with Breast Cancer: A Nonrandomized Controlled Trial, *JAMA Surgery* (2024). [jamanetwork.com/journals/jamasurg/abstract/272407](https://jamanetwork.com/journals/jamasurg/abstract/272407)

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