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NEWS

RSNA Press Release

Higher Volume Reduces False Positives in Screening Mammography

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At A Glance

- Radiologists who interpret more mammograms annually have fewer false-positive findings.
- False-positive findings cause anxiety for patients and prompt additional testing and costs.
- To improve performance, radiologists should interpret both screening and diagnostic mammograms.

OAK BROOK, Ill. — Radiologists who interpret a high volume of mammograms may not detect more cancers but are better at determining which suspicious lesions are not malignant, according to a new study published online and in the April print edition of *Radiology*.

"Contrary to our expectations, we observed no clear association between volume and sensitivity," said the study's lead author, Diana S.M. Buist, Ph.D., M.P.H., senior investigator at the Group Health Research Institute in Seattle. "We did, however, find that radiologists with higher interpretive volume had significantly lower false-positive rates and recalled fewer women per cancer detected."

An exam result is considered to be a false positive when further testing is recommended for a suspicious lesion but no cancer is found. In addition to causing anxiety for patients, false positives prompt additional testing that costs approximately $1.6 billion per year, according to Dr. Buist.

The study, partially funded by the American Cancer Society and the National Cancer Institute, included a review of data from six Breast Cancer Surveillance Consortium mammography registries in California, North Carolina, New Hampshire, Vermont, Washington and New Mexico.

The researchers examined various measures of interpretive volume in relation to screening performance for 120 radiologists who interpreted 783,965 screening mammograms between 2002 and 2006. Volume was measured in four ways: the number of screening and diagnostic mammograms read by a radiologist annually—both separately and in combination—and the ratio of screening to diagnostic mammograms. Screening performance was measured by sensitivity (the ability to detect all cancers present) and false-positive and cancer detection rates.

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The results showed that performance varied not only by the number of exams interpreted, but also by the ratio of screening to diagnostic exams interpreted.

"Our analysis demonstrated that screening interpretive performance is unlikely to be affected by volume alone, but rather by a balance in the interpreted exam composition," Dr. Buist said. "The data suggest that radiologists who interpret screening mammograms should spend at least a portion of their time interpreting diagnostic mammograms, because radiologists who interpreted very few diagnostic mammograms had worse performance, even if they read a high volume of screening mammograms."

Because the study found that radiologists with higher annual interpretive volumes had lower false-positive rates—while maintaining sensitivity rates similar to their lower-volume colleagues—the researchers simulated the effect of increasing the minimum interpretive volume required of radiologists practicing in the U.S., which is currently 960 mammograms every two years.

Based on 34 million women aged 40-79 receiving screening mammograms each year, the researchers estimated that increasing the annual minimum total volume requirement to 1,000 would result in 43,629 fewer women being recalled. The estimated cost associated with false-positive results would be reduced to $21.8 million.

"Recommending any increase in U.S. volume requirements would entail crucial decisions about the relative importance of cancer detection versus false positive exams and workforce issues, since changes could curtail workforce supply and women's mammography access," Dr. Buist said.

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"The Influence of Annual Interpretive Volume on Screening Mammography Performance in the United States." Collaborating with Dr. Buist were Melissa L. Anderson, M.S., Sebastien J-P.A. Haneuse, Ph.D., Edward A. Sickles, M.D., Robert A. Smith, Ph.D., Patricia A. Carney, Ph.D., Stephen H. Taplin, M.D., M.P.H., Robert D. Rosenberg, M.D., Berta M. Geller, Ed.D., Tracy L. Onega, Ph.D., Barbara S. Monsees, M.D., Lawrence W. Bassett, M.D., Bonnie C. Yankaskas, Ph.D., Joann G. Elmore, M.D., M.P.H., Karla Kerlikowske, M.D., and Diana L. Miglioretti, Ph.D.

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