single sample collected by digital rectal examination (DRE) versus six samples collected at home (two samples from each of three stools collected on consecutive days)—in 2,665 patients who also had colonoscopies. The take-home FOBT kit found 23.9% of the advanced neoplasms (defined as adenomas with diameter $\geq 10$ mm, adenomas with a villous component of $\geq 25\%$, adenomas with high grade dysplasia, or cases of intramucosal or invasive carcinoma) found by colonoscopy, while the in-office FOBT found just 4.9%. Among patients with invasive cancer, the take-home test was positive in 29.8% and the digital FOBT was positive in only 9.5%.

Expressing these results as likelihood ratios makes the deficiency of the in-office test even more apparent. The positive likelihood ratio (true positives/false positives) for advanced neoplasms was 1.68 (95% CI, 0.96 to 2.94). The corresponding negative likelihood ratio (false negatives/true negatives) was 0.95 (95% CI, 0.95 to 1.01). In other words, a negative result was as likely to be a false negative as a true negative. A likelihood ratio of 1 means, by definition, that the test result is completely useless.

“Normal test results from [in-office FOBT] are no assurance whatsoever that colorectal cancer is not present,” Smith said. “Health care providers should abandon the practice of in-office FOBT for colorectal cancer screening immediately.”

Using the wrong screening test isn’t the only problem, though. Smith’s study also found that many doctors aren’t doing proper follow up when an FOBT is positive.

The ACS and GI Consortium guidelines specify that patients with positive FOBT results should be sent for follow-up colonoscopy. Yet of 1,120 doctors who reported their follow-up procedures in the study, 29.7% said they give patients another FOBT if the first test turns out positive. Of the 925 doctors who reported a follow-up procedure other than FOBT, 52.8% said they send patients for colonoscopy and 22.5% said they send patients for sigmoidoscopy. An additional 15.7% said they give patients a double-contrast barium enema, sometimes with along with sigmoidoscopy or colonoscopy.

The findings suggest a need for greater awareness of screening guidelines, Smith and his coauthors wrote.

“Although the 24% sensitivity of the take-home FOBT for detecting advanced neoplasms initially sounds unimpressive, it's important to remember that the cumulative sensitivity of annual testing is much higher. The evidence from prospective randomized trials has shown that colorectal cancer mortality can be reduced by 30% or more from proper application of [FOBT], which means annual at-home collection of six samples from three consecutive bowel movements,” Smith said. “The key message to patients and clinicians from these two studies is that the convenience of office testing is no substitute for proper use of the test.”

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STUDY QUESTIONS NEED FOR YEARLY MAMMOGRAMS IN WOMEN OVER 50

A recent study suggests women 50 and older may be able to wait as long as two years between mammograms.

Researchers from the Fred Hutchinson Cancer Research Center in Seattle examined the records of 7,840 women diagnosed with invasive breast cancer or ductal carcinoma in situ to determine whether a longer interval between exams would cause breast tumors to be found at a later stage.

In women over 50, going two years between mammograms didn’t seem to make a difference. These older women were no more likely to be diagnosed with advanced cancer than women who got mammograms every year (OR = 0.97 for women 50-59, OR = 0.99 for women 60-69, OR = 0.88 for women 70 and older), the researchers report in the Journal of the National Cancer Institute (2004;96:1832–1839).
But for women in their 40s, the two-year interval did lead to greater risk of later-stage tumors being detected (OR = 1.35).

The findings should be taken into account when major health groups revise their guidelines for breast cancer screening, said lead researcher Emily White, PhD.

The ACS already recommends that women in their 40s get a mammogram every year to look for breast cancer.

“We have known for many years that breast cancer grows faster in younger women compared with older women,” said Robert Smith, PhD, Director of Cancer Screening for ACS. “Based on that evidence, the ACS modified its guidelines in 1997 to recommend annual screening to women in their 40s.”

“For women under 50, having screening every year compensates for the problem that they have faster growing tumors,” White said. “But it doesn’t compensate for the fact that they have denser breasts and it’s harder to read the mammogram.”

The ACS also advises women aged 50 and older to get a mammogram every year. Does White’s study mean that advice is no longer valid?

Not necessarily, said Smith. One reason the ACS urges older women to get screened every year is because there are so many factors at play—age, individual risk, individual characteristics, and the quality of screening where women are being seen—that a more cautious approach is still needed at this time. Breast density, family history of breast cancer, or use of hormone therapy all might make a difference in how fast a tumor grows and how easy it is to find.

Although there are studies suggesting it’s safe to wait two years between mammograms, “we cannot say exactly at what [age] women could start screening at a wider interval,” Smith said. While the age of 50 may be easy to remember, it may not be the best cutoff point.

White’s study will be one of many taken into consideration when it’s time to review the screening guidelines, he said, which occurs no less frequently than every five years, and even more frequently if new findings suggest the need for an interim update. At that time it may also be possible to find other studies that help define age groups or other factors that could safely allow women to wait longer between mammograms. The guidelines were last updated in 2003.

A potential advantage to screening older women less often, White said, would be the money saved. “You don’t want to spend health care dollars on things that don’t bring a benefit,” she said.

Smith agreed that looking at the costs to society is important, but questioned how much money could really be saved.

“If women over age 50 could be screened every two years with the same benefit as annual screening, then the cost savings could be considerable,” he said, “if we [currently] had high rates of adherence to recommended screening guidelines.”

The problem is, most women don’t follow the current guidelines. Right now, women are more likely to get screened every 18 to 36 months, Smith said. That means the cost savings from moving to a two-year schedule might not be as large as expected, although it could still be considerable because so many women get screened.

Even a two-year mammography interval can have an impact on breast cancer mortality, though. Writing in BMJ (2005;330:220–223), Danish researchers report that breast cancer mortality dropped by 25% in Copenhagen after the city introduced biannual screening for women 50 and older. The screened women were compared with women in other regions of the country where organized screening was not available.

Today, some health insurers pay for annual mammograms, and some pay only for mam-
mograms every two years, Smith said. Medicare pays for women 40 and older in the program to have a mammogram every year.

**MORE DETAILS ON RED MEAT, COLON CANCER LINK**

High consumption of red or processed meats has been linked to colorectal cancer in numerous studies. Recent work by ACS epidemiologists helps put the relationship into perspective.

“Our study was better able to separate the risk associated with meat consumption from that associated with other factors that affect colorectal cancer risk, especially obesity and physical inactivity,” said coauthor Michael Thun, MD, MS, Vice President for Epidemiology and Surveillance Research at the ACS.

The verdict: eating large amounts of red or processed meat over a long period of time can indeed raise colorectal cancer risk. But the risks from such a diet are smaller than those from obesity and lack of exercise, both for colon cancer and for overall health.

“While these risks [from meat consumption] to overall health are not in the same league as the risk from smoking, obesity, and physical inactivity,” said Thun, “these findings are important because red and processed meat are major components of the diet of many Americans, and because there is now substantial evidence that long-term high consumption increases the risk of colon cancer.”

The findings, published in *JAMA* (2005; 293:172–182), are based on a long-term study of nearly 149,000 men and women aged 50 to 74 in the Cancer Prevention Study (CPS) II Nutrition Cohort, a subset of the CPS II Mortality Cohort. The participants filled out a questionnaire about their eating habits in 1982 and again in 1992/1993. Thun and his colleagues looked at how many people had developed colon cancer by 2001, then analyzed the risk according to how much red meat, processed meat, poultry, or fish the people had eaten.

People who ate the most red meat in both time points (1982 and 1992/1993) were 30% to 40% more likely to develop cancers of the lower colon or rectum than those who ate the least red meat. Those who ate the most processed meats were 50% more likely to develop cancers of the lower colon (descending and sigmoid) compared with those who ate the least. These analyses compared risk among people in the top third (highest tertile) of meat consumption with those in the bottom third (lowest tertile).

For red meat (beef, lamb, pork), the cutoff for the highest tertile was three or more ounces per day for men—approximately the amount of meat in a large fast-food hamburger. For women, the top tertile started at two or more ounces per day. For processed meat (bacon, sausage, hot dogs, ham, cold cuts), the highest tertile started at one ounce eaten five or six days per week for men, and two or three days per week for women. A slice of bologna weighs about one ounce; two slices of cooked bacon weigh a little more than half an ounce.

Eating poultry and fish did not raise the risk of colon cancer. To the contrary, people in the highest tertile of poultry and fish consumption were 30% less likely to develop descending and sigmoid colon cancers than were people in the lowest tertile. The ratio of red meat to poultry and fish consumption was also predictive; compared with those in the lowest tertile, people in the highest tertile were about 50% more likely to be diagnosed with cancers of the descending and sigmoid colon.

The study findings add weight to current ACS dietary guidelines, which recommend limiting red meat in favor of other sources of protein like poultry, fish, or beans, Thun said.

“This is not a condemnation of red meat, but it is part of a growing body of evidence that red meat shouldn’t be the mainstay of your diet,” he explained.