among smokers. For example, among non-smokers exposed to 800 Bq/m³ of radon, the lifetime risk of developing lung cancer by age 75 is about 1%, about double the absolute risk among individuals with no radon exposure (0.5%). Among current smokers of 15 to 24 cigarettes a day, the absolute risk of developing lung cancer after 800 Bq/m³ radon exposure is about 22%, about double the risk in smokers not exposed to radon (10%).

The risks of radon have been known for decades and were based primarily on studies of miners exposed to extremely high levels of the gas while working underground. Calculating the potential risks to the general public is more difficult because radon exposure is highly variable depending on where people live and what type of residence they occupy—radon levels vary according to soil type and concentrations tend to be greater in lower levels of a home, such as the basement.

The EPA has recommended radon testing in homes for years, and in January 2005 the US Surgeon General issued a national health advisory on the subject. The advisory said radon is the second leading cause of lung cancer in the US (smoking is first) and causes more than 20,000 lung cancer deaths in the country each year. Venting systems can be installed in homes to lower indoor radon levels and reduce the risk.

“It would be good for doctors to talk to their patients about the risks of radon,” Ward said, “particularly in those parts of the country where the potential for radon exposure in homes is high.”

The EPA estimates that 1 in 15 US homes have excessive levels of radon. The agency provides a county-by-county map of estimated radon levels on its Web site at http://www.epa.gov/iaq/radon/zonemap.html. Consumer information describing the risks of radon, home modifications to lower the risk, and ways to find qualified contractors to perform the work are available at http://www.epa.gov/iaq/radon/pubs/index.html. The booklet A Physician’s Guide—Radon: The Health Threat with a Simple Solution, developed by the EPA and the American Medical Association, is also available online at http://www.epa.gov/radon/pubs/physic.html.

IN-OFFICE FOBT INACCURATE, BUT WIDELY USED

Two studies recently published in the Annals of Internal Medicine (2005;142:81–85 and 86–94) show that in-office fecal occult testing (FOBT) is still widely used in the United States, despite being highly inaccurate and not recommended by any professional guidelines for colorectal cancer screening.

In a survey of 1,147 physicians analyzed by researchers from the ACS, the US Centers for Disease Control and Prevention (CDC), the National Institutes of Health, and the University of North Carolina at Chapel Hill, nearly 33% said they use this method exclusively to screen asymptomatic, average risk patients for colorectal cancer. Yet the test detects fewer than 5% of colorectal cancers, according to researchers with the Department of Veterans Affairs.

Those findings point to a “disturbing pattern of low-quality fecal occult blood testing and follow up, indicating that millions of adults are undergoing testing that, for the most part, is entirely worthless,” said Robert Smith, PhD, director of cancer screening for the ACS and coauthor of the report on doctors’ use of in-office versus take-home tests.

The ACS recommends colon cancer screening for all adults at average risk starting at age 50. A yearly fecal occult blood test (FOBT) is one of the acceptable screening methods—but only when the multisample take-home kit is used. FOBT performed on a single stool sample taken during a rectal exam is not considered an adequate, or acceptable, substitute.

The Veterans Affairs study shows clearly why in-office FOBT poses a problem. This study compared the two methods of FOBT—a
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 ≥ 10 mm, adenomas with a villous component of ≥ 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.”

**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).