smokers, the life-gained selection model led to the greatest gains in life expectancy. It also identified a population of moderately high-risk, but younger and healthier, smokers who would benefit from screening and otherwise would be excluded by both risk-based and USPSTF screening recommendations.

In explaining why risk-based or USPSTF screening recommendations may not benefit some patients, Dr. Cheung gives the example of a high-risk individual who is discovered to have a potential lung cancer but is too frail or unhealthy to undergo follow-up procedures. “Despite detecting a potential lung cancer, the benefits of screening for that individual would not outweigh the harms,” he says, adding that neither the risk-based strategy nor USPSTF recommendations would impact the years of life gained in this case.

In an accompanying editorial, University of Michigan professors Tanner Caverly, MD, MPH, an assistant professor of learning health sciences and internal medicine, and Rafael Meza, PhD, an associate professor in the department of epidemiology, praised the added accuracy of both risk-based and life-gained approaches. They also pointed to the need for future studies that evaluate the acceptability of including race and socioeconomic status when calculating both lung cancer risk and life expectancy.

Ashley Prosper, MD, assistant clinical professor of radiology at the University of California at Los Angeles and co-director of its lung cancer screening program, agrees that the USPSTF recommendations need to be improved. However, she favors a risk-based screening approach over the life-gained model. Dr. Prosper notes that in the study, the risk-based model comprised 79% former smokers and approximately 21% current smokers, whereas the life-gained model was essentially the opposite: it included 77% former smokers and 23% current smokers.

“I find that particularly interesting because we know that the smoking rate is declining in the United States, and if this trend continues, I think we have to be cautious about excluding former smokers who are at risk for lung cancer,” Dr. Prosper says. “When we think about revising the selection criteria, we really want to be as inclusive as possible.”

With regard to ethnicity, Dr. Prosper says, those selected solely by the life-gained model included fewer numbers of African American and Hispanic individuals (11% and 3%) compared with the risk-based model (13% and 6%, respectively). She points out that African American men in particular are 57% more likely than white men to develop lung cancer, although their overall exposure to cigarette smoke is lower, according to the American Lung Association. “We want to be really careful not to potentiate health care disparities, particularly when we know that African Americans have the highest morbidity and mortality problems in lung cancer,” Dr. Prosper says. “Some of the strengths of the risk-based model are that you’re able to capture more former smokers and older patients at risk and improve inclusion of both blacks and Hispanics.”

However, Dr. Cheung says, when also considering the 6.73 million adults selected by both strategies, the percentages of minorities are essentially the same, with African American, Hispanic, and Asian individuals at 13.1%, 3.3%, and 1.4%, respectively, in the risk-based model versus 12.7%, 2.7%, and 1.4% in the life-gained model. Moreover, he adds, both approaches include more African Americans than the current USPSTF guidelines (7.7%). “The life-gained–based approach also remedies racial and ethnic health disparities, while choosing people who are more likely to benefit from screening,” he says.

**References**


DOI: 10.1002/cncr.32720

---

**New Research Finds Lung Cancer Screening Guidelines Are Insufficient for Firefighters**

When Vershalee Shukla, MD, a radiation oncologist at the Vincere Cancer Center in Scottsdale, Arizona, began reading about the many 9/11 firefighters who had developed lung cancer, she wondered whether low-dose CT screening could help to detect such cases in the early, more treatable stage. She launched a pilot study in 2018 to seek answers, and one of her first discoveries was that low-dose CT was not high on the radar of many physicians working with fire departments.

“As a radiation oncologist, I’m comfortable using low-dose CT, while a lot of the physicians treating firefighters have not utilized them as frequently,” Dr. Shukla says. “Currently, what most fire departments are doing is chest x-rays every 5 years, but they’re missing cancers.”

For her study, which she presented in October at the International Association for the Study of Lung Cancer’s 2019 North America Conference on Lung Cancer, held in Chicago, Dr. Shukla and colleagues screened 350 Arizona firefighters aged 34 to 76 years who had worked for an average of ≥21 years. Of the 195 patients who warranted low-dose CT, 86 patients, or 44.1%, were found to have abnormal findings that required additional monitoring or follow-up.

The only current national lung cancer screening guidelines from the US Preventive Services Task Force (USPSTF) call for annual, low-dose CT screening in adults aged 55 to 80 years who have ≥30 pack-years of exposure and currently are smoking or have quit within the past 15 years. No current guidelines recommend using low-dose CT in individuals such as first responders who may develop the disease from occupational exposures, which account for approximately 30% of lung cancer cases, Dr. Shukla notes. Although most firefighters are fit and do not smoke, they...
are exposed to a number of carcinogens on the job, particularly from synthetic fibers such as plastics, epoxies, and latex, that are common in today's homes and commercial buildings, she adds.

A National Institute for Occupational Safety and Health study conducted among 30,000 career firefighters between 1950 and 2009 found a 9% increase in all cancer diagnoses and a 14% increase in all cancer-related deaths compared with the general population.1 Although no recent study has exclusively examined lung cancer among firefighters, Dr. Shukla thinks those risks could be higher today because of the new synthetic materials and believes that more evidence could be sufficient to warrant a change in screening guidelines for lung and other cancers among firefighters and other first responders.

Upon learning that firefighters were developing lung cancer well before age 55—the disease tends to take approximately 20 years to develop, and many firefighters start their careers at young ages—Dr. Shukla lowered her low-dose CT screening age beyond the USPSTF recommended guideline to 40 years.

Because Arizona has many cases of what is known as "valley fever," a fungal infection in the lung that can be mistaken for cancer, she found a number of nodules during the study. However, she also detected a thymoma (a tumor in the thymus) in a 42-year-old individual and a primary lung cancer in a 48-year-old individual. In addition, a stage IIIIB lung cancer was recently diagnosed in a 38-year-old firefighter who had had a normal chest x-ray 2 years before.

"We know chest x-rays every 5 years are not adequate, and we're trying to find out what a good, healthy medium is," Dr. Shukla says.

Because low-dose CT carries a risk of unnecessary biopsies, she and her colleagues are working to avoid that by meeting monthly to review the largest and most worrisome nodules and discuss whether they need to be biopsied. Dr. Shukla was also appointed to an Arizona State Senate ad hoc committee charged with reducing cancer incidence and carcinogens among firefighters statewide. Furthermore, the city of Phoenix is supporting her efforts to screen for lung cancer in 2000 firefighters to glean more data on a larger scale.

"Hopefully by doing this, I'll be able to have a huge impact nationally, and we can change guidelines," she says.

Other cities such as San Diego and Boston have also initiated lung cancer screening programs for firefighters, and this past July, the Centers for Disease Control and Prevention launched a voluntary nationwide registry that will track the number and types of fires attended by each firefighter. These data will give researchers a trove of new information, including whether lung cancers in firefighters are more aggressive than other types of tumors.

Firefighters are also at higher risk of colorectal cancer, often because of asbestos exposure in older buildings, according to Dr. Shukla. With that in mind, she is leading another study that conducts colonoscopies among firefighters as young as 35 who are at highest risk of the disease. Although some of them may only have been on the job for 10 years, they may have had significant exposure to carcinogens, putting them at higher risk, she notes. For example, her team detected colorectal cancer in both a 35-year-old and a 42-year-old firefighter. Dr. Shukla and her colleagues are risk stratifying candidates by meeting with each firefighter and physician and screening those who have fought fires involving hazardous materials and Federal Emergency Management Agency–related fires.

Reference
DOI: 10.1002/cncr.32721

Experts Say More Women Should Be Tested For BRCA1 and BRCA2 Genetic Mutations

New recommendations from the US Preventive Services Task Force (USPSTF) indicate that more women may benefit from genetic testing for the BRCA1 and BRCA2 mutations linked to hereditary breast and ovarian cancer, especially if they have already survived cancer once.

The new recommendations, published in JAMA, broaden the scope of who should be evaluated for testing of these mutations.1 They suggest that primary care clinicians assess the risk in women who have a personal or family history of breast, ovarian, fallopian tube, or peritoneal cancer as well as those who have an ancestry associated with BRCA1/BRCA2 mutations. If those patients have a positive result in that risk assessment, they should receive genetic counseling and potentially testing for the mutations, according to the recommendation. Women with no personal or family history of these diseases or ancestry associated with the mutations should not receive routine assessment or genetic counseling and testing, the panel concludes.

Fewer than 1% of all women have a mutation in either of the BRCA genes. The recommendation provides guidance regarding the steps women can take to determine whether they are at risk of the mutations, starting with talking to their clinician about their personal or family history and ancestry. The panel adds that women should undergo testing only after they have discussed the benefits and harms with a clinician. The USPSTF is an independent, volunteer panel of national experts in prevention and evidence-based medicine.

Reference
DOI: 10.1002/cncr.32723