

# Does screening reduce lung cancer mortality?

## Evidence-based answer

It's not clear. Neither routine chest x-ray (with or without sputum cytology) nor low-dose computed tomography (CT) have been proven to reduce mortality when used for lung cancer screening, although

low-dose CT screening does identify lung cancer at an early stage in high-risk patients (strength of recommendation: **B**, based on heterogeneous cohort studies). Large studies of both imaging approaches are ongoing.

## Clinical commentary

### Let's prevent lung cancer so we don't have to worry about screening

While some trials suggest possibly useful screening tools, and myriad other trials are underway, one point often gets short shrift: the importance of preventing cancer from occurring in the first place. Most family physicians already screen for smoking and offer counseling and pharmacologic assistance to smokers. We should also be aggressively counseling our adolescent

and young adult patients against starting to smoke. Ideally, we would help people reduce their exposure to secondhand smoke, as well. When a teachable moment comes along, we should take the time to educate our patients about their specific risk factors and how they can be modified. Preventing the problem before it starts is our patients' best defense against lung cancer.

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## Evidence summary

### Chest x-ray and cytology:

#### A trend toward reduced mortality

A Cochrane review<sup>1</sup> identified 6 randomized controlled trials (RCTs) and 1 non-RCT (with a total of 245,610 patients) that screened patients with serial chest x-rays, with or without sputum cytology. Most patients were current or ex-smokers or had significant exposure to industrial smoke. No studies included an unscreened control group, and only 1 included women.

There was a trend toward reduced mortality with the combination of annual chest x-ray and sputum cytology

compared with annual x-ray alone, but it was not statistically significant (relative risk [RR]=0.88; 95% confidence interval [CI], 0.74–1.03). However, more frequent screening with chest x-rays (2 or 3 times/year) was associated with an 11% increase in mortality compared with less frequent x-rays (RR=1.11; 95% CI, 1.00–1.23). The authors concluded that there was insufficient evidence to support screening with chest x-ray or sputum cytology.

### Low-dose CT: Studies reach different conclusions

A 2006 study followed a cohort of at-risk patients using low-dose CT screening.<sup>2</sup>

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Lung carcinoma on CT scan



## FAST TRACK

**Low-dose CT screening does identify lung cancer at an early stage in high-risk patients**

## FAST TRACK

## Screening for lung cancer with x-ray, cytology, or CT scan is rated "I" for insufficient data by the USPSTF

There were 31,567 patients evaluated initially, of which 27,456 had an annual repeat screening. Most patients were current or former smokers (83%); patients with exposure to occupational and secondhand smoke were also included. A positive initial screen was defined as a solid or partly solid noncalcified nodule  $\geq 5$  mm in diameter; a nonsolid, noncalcified nodule  $\geq 8$  mm in diameter; or a solid endobronchial nodule. A positive screen during follow-up was defined as any new noncalcified nodule, regardless of size.

Positive tests occurred in 13% of baseline screens and 5% of annual screens. Biopsies were performed according to a study protocol based on a nodule's size and behavior over time. Out of a total of 5646 positive screens, there were 535 biopsies, and a diagnosis of cancer in 492 patients. Of those with cancer, 412 (84%) had clinical stage I lung cancer; the authors estimated their 10-year survival rate was 88% (95% CI, 84%–91%). If patients with stage I disease underwent surgical resection within 1 month of diagnosis, their estimated 10-year survival increased to 92% (95% CI, 88%–95%).

However, a cohort study using annual CT scanning to screen 3246 patients for lung cancer came to a different conclusion.<sup>3</sup> The authors compared the observed number of lung cancer cases, resections, advanced lung cancer diagnoses, and deaths in screened patients with the expected rates based on validated prediction models. Lung cancer was diagnosed in 144 patients compared with 44 expected cases (RR=3.2; 95% CI, 2.7–3.8). Subsequently, 109 patients underwent lung resection compared with 11 expected (RR=10.0; 95% CI, 8.2–11.9). However, there was no decline in advanced cancers (42 actual vs 33 expected;  $P=.14$ ) and no difference in deaths due to lung cancer (38 actual vs 38.8 expected;  $P=.9$ ). The 81 patients diagnosed in this study with stage I disease who underwent surgical resection had 4-year estimated survival rates of 94% (95% CI, 85%–97%), matching the prior low-dose CT study.

### Major studies of both methods are ongoing

Other major studies are in progress. There is an RCT involving 154,942 male and female patients using annual chest x-ray screening vs no screening that will involve 14 years of follow-up.<sup>4</sup> Another RCT is evaluating annual low-dose CT vs annual chest x-ray for 3 years in 50,000 at-risk men and women.<sup>5</sup> Finally, investigators are conducting an RCT with 4000 at-risk patients comparing annual CT screening with no screening.<sup>6</sup>

### Recommendations from others

The US Preventive Services Task Force gives an "I" recommendation (data insufficient) to screening for lung cancer with cytology, chest x-ray, or CT scanning.<sup>7</sup> The American College of Chest Physicians stated in 2003 that the early studies of low-dose CT appeared promising; however, they recommended that individuals should only be screened with low-dose CT in the context of well-designed clinical trials.<sup>8</sup> ■

### References

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