
RSNA Press Release

Benefits of Lung Cancer Screening with CT Questioned

Released: March 24, 2005

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OAK BROOK, Ill. - Annual screening with helical computed tomography (CT) can help radiologists detect lung cancers at their earliest, most curable stage, but has not been shown to reduce mortality from the disease, according to a study published in the April issue of the journal *Radiology*.

"What we're finding with CT screening are more early-stage cancers. That could be good news—finding cancers that we'd otherwise find at a late stage," said the study's lead author, Stephen J. Swensen, M.D., professor and chair of the Department of Radiology at Mayo Clinic in Rochester, Minn. "However, a number of these are probably non-lethal or slow-growing cancers that the patient would likely have died with and not from. Other cancers were so aggressive that early detection with CT did not make a difference."

Lung cancer is the leading cause of cancer death in both men and women in the United States, killing more people than breast, prostate and colon cancers combined, according to the American Cancer Society (ACS). ACS estimates that in 2005 there will be approximately 172,570 new cases of lung cancer diagnosed in the United States and 163,510 people will die from the disease.

While recent studies have focused on the benefits of early detection, the Mayo researchers looked more closely at the negative impact of CT screening, including over-diagnosis, expense, changes to quality of life, unnecessary surgical procedures and mortality. The study, funded in part by the National Cancer Institute, represents the most complete follow-up of the same group of patients of any published CT lung screening research.

Between January 1999 and May 2004, Dr. Swensen and colleagues studied 1,520 current and former smokers at high risk for lung cancer. The patient group contained 788 men and 732 women, age 50 or older (median age 59). All patients received an initial low-dose, helical CT examination, with annual screenings over the next four years. CT depicted 3,356 nodules in 1,118 (73.6 percent) of the patients. The researchers documented 68 primary lung

At A Glance

- CT depicts many lung cancers at an early, treatable stage, but also identifies many benign growths as suspicious.
- CT screening has not yet been shown to reduce lung cancer mortality.
- Lung cancer is the leading cause of cancer death in both men and women in the United States.

cancers in 66 patients. Thirty-one of the tumors were detected at the initial screening and 34 at subsequent screenings. Three cancers were diagnosed by other means between screenings.

Approximately 69 percent of patients had at least one false-positive finding. False-positives are uncalcified lung nodules proved benign by observation or biopsy. Among the cancers identified through CT screening, false-positive rates ranged from 92.4 percent among nodules 4 millimeters or larger to 96.0 percent among all nodules.

"Currently, half of lung nodules suspected of being cancerous that go to surgery outside of research study centers turn out to be benign," Dr. Swensen said. Surgical intervention to diagnose these nodules is expensive and may impact quality of life and mortality. According to Dr. Swensen, a small percentage of patients will have chronic pain as a result of surgery, and the average mortality rate from lung cancer surgery ranges from 3 to 5 percent. "That's a big price to pay if it's a benign nodule," he said.

The researchers found no significant difference when comparing mortality rates demonstrated by this study to those of the Mayo Lung Project, a lung cancer screening trial conducted in the 1970s using chest radiography, lending support to their suggestion that while CT helps radiologists find more early-stage cancers, many of these are slow-growing tumors that probably would not have been lethal over the patient's lifetime.

"While there is still reason to hope that early detection of lung cancer with CT may save lives, our results lead us to be very cautious, because there's a chance that we may be doing more harm than good," Dr. Swensen said.

No professional health organizations currently recommend CT screening for lung cancer.

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Radiology is a monthly scientific journal devoted to clinical radiology and allied sciences. The journal is edited by Anthony V. Proto, M.D., School of Medicine, Virginia Commonwealth University, Richmond, Va. *Radiology* is owned and published by the Radiological Society of North America, Inc. (radiology.rsna.org)

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"CT Screening for Lung Cancer: Five-Year Prospective Experience." Collaborating with Dr. Swensen on this paper were James R. Jett, M.D., Thomas E. Hartman, M.D., David E. Midthun, M.D., Sumithra J. Mandrekar, Ph.D., Shauna L. Hillman, M.S., Anne-Marie Sykes, M.D., Gregory L. Aughenbaugh, M.D., Aaron O. Bungum, B.S., and Katie L. Allen, B.S.