

## NEW DEVELOPMENTS IN LUNG CANCER SCREENING

Pioneering studies by Claudia Henschke PhD, MD at Mount Sinai Hospital showed that annual low dose lung CT(LDCT) scans in heavy smokers can detect six times more small, early, Stage 1 lung cancers than chest X-rays. These results stimulated the National Cancer Institute to start the National Lung Screening Trial (NLST) which enrolled 53,454 persons who were 55 years of age or older and had smoked at least one pack of cigarettes a day for thirty years; 26,722 persons were randomly assigned to screening with LDCT and 26,732 persons were randomly assigned to screening with chest x-ray.

The trial showed that three years of annual LDCT with 6 years of follow-up resulted in a 20% reduction in the death rate of lung cancer confirming the benefit of CT screening.

Eight more observational studies of LDCT, in various parts of the world, have confirmed these findings. These are relatively small studies, ranging from about 600 to 8,000 participants, which began between 1992 and 2000.

Most of the studies include a substantial percentage of women, and the studies in Japan include non-smokers. Findings include a nodule or positivity rate of 5% to 51%, 0.4% to 3% lung cancers, 50% to 95% adenocarcinomas, 50% to 91% stage I cancers.



False-positive test results and over-diagnosis must be considered when screening for lung cancer with LDCT. The false-positive test result may lead to anxiety and invasive diagnostic procedures such as needle biopsy or thoracotomy (open chest surgery).

In the Early Lung Cancer Action Program (ELCAP) study, led by Dr. Henschke, showed that non-calcified (suspicious) nodules were detected in about 20% of patients without lung cancer at the initial (prevalence) screen. [Continued.....](#)

## Lung Cancer Risk Factors and Prevention

### Risk factors

The most important risk factor for lung cancer (as for many other cancers) is the use of tobacco. Cigarette smoking has been definitively established as the primary cause of lung cancer. This causative link has been widely recognized since the 1960s, when national reports in Great Britain and the United States brought the cancer risk of smoking prominently to the public's attention. The percentages of lung cancers estimated to be caused by tobacco smoking in males and females are 90% and 78%, respectively.

Environmental or secondhand tobacco smoke is also implicated in causing lung cancer. Environmental tobacco smoke has the same components as inhaled smoke, although in lower concentrations; between 1% and 10%, depending on the constituent. Carcinogenic compounds in tobacco smoke include the polynuclear aromatic

hydrocarbons (PAHs), including the classical carcinogen benzo[a]pyrene and the nicotine-derived tobacco-specific nitrosamine, 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK). Elevated biomarkers of tobacco exposure, including urinary cotinine, tobacco-related carcinogen metabolites, and carcinogen-protein adducts, are seen in passive or secondhand smokers.

Many other exposures have been established as causally associated with lung cancer, but even the combined effect of these additional factors is very small compared with cigarette smoking. These additional causal factors are primarily related to occupational exposures to agents such as asbestos, arsenic, chromium, nickel, and radon. Radon, a naturally occurring gas, is of relevance to the general public because of the potential exposure in homes. [Continued.....](#)

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Thirty-one (13%) of 233 individuals with non-calcified nodules underwent biopsies, of which nearly 90% (27 of 31 patients) resulted in a diagnosis of malignancy, and the prevalence of cancers detected was 2.7% or 27 per 1,000 screens. Further results of the expanded International (I)-ELCAP studies, which has been conducted by a team of highly trained radiologists in more than 60 institutions, has found a more than 70% reduction in the risk of dying of lung cancer.

A less familiar harm is over-diagnosis, the diagnosis of a condition that would not have become clinically significant had it not been detected by screening. In the context of screening with LDCT, over-diagnosis could lead to unnecessary diagnosis of lung cancer requiring some combination of surgery (e.g.lobectomy), chemotherapy, and radiation therapy.

Although over-diagnosis is impossible to document in a living individual, multiple evaluations suggest that the frequency of overdiagnosis is low. It is hoped in the future that molecular markers will provide further information as to who is at risk of lung cancer and if diagnosed with lung cancer, what is the best treatment. Dr. Claudia Henschke, Director of the Mount Sinai Lung Cancer Screening Program comments that "as of January 1, 2015, the benefit of CT screening will become widely available to people at high-risk of lung cancer given the conclusions of the United States Preventive Services Task Force. Thus insurance companies will be covering this potentially-life saving screening for people at high risk of lung cancer".

[For further information go to Home Page, click on Screening & Prevention and Lung Cancer.](#)

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#### **Prevention**

The avoidance of smoking and second hand smoke is the most important single factor. Will power and smoking cessation programs in conjunction with medication and nicotine patches give the best results.

Studies are being conducted in smokers using Phenethyl Isothiocyanate, which a naturally occurring compound is found in cruciferous vegetables such as broccoli, cabbage, **cauliflower** and kale. Metformin, which is used to treat type II diabetes and Iloprost, used for treating blood vessels diseases, are also being studied. It should be noted that beta-carotene increases the lung cancer rate in smokers.



November is Lung Cancer Awareness Month

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## Sicilian-Style Cauliflower

### The Strang Cancer Prevention Cookbook

**Reduce Your Risk for Cancer by Eating a Healthy Diet!**

4 servings

2 teaspoons olive oil.  
2 celery ribs, sliced.  
2 cloves garlic, peeled, lightly crushed, and sliced.  
1 medium onion, halved and sliced.  
1/2 jalapeno pepper or 1/4 teaspoon hot red pepper flakes.  
3 anchovy fillets, chopped.  
1 bay leaf.  
1 large head cauliflower (2 pounds), cored, outer leaves removed, and florets broken into small pieces.  
2 tablespoons rinsed and drained capers.  
1 medium potato, peeled and cubed.  
1/3 cup dry white wine.  
5 cups White Chicken Stock , low-sodium canned broth or water.  
Salt.



Heat the olive oil in a large saucepan, preferable non-stick, set over medium-high heat. Add the celery, garlic, onion and jalapeno and cook, stirring often, until soft, about 5 minutes. Add the anchovies and bay leaf, cook for another minute, then add the cauliflower, capers, and potato. Cook, stirring, for 2 to 3 minutes. Add the wine and cook until almost completely evaporated, 1 to 2 minutes. Add the stock and bring to a boil. Reduce the heat and simmer until the vegetables are very tender. Add 1/2 cup of water here and there, if necessary during cooking; the vegetables should be breaking apart, and the mixture will be stew like in consistency. Adjust the seasoning with salt, if necessary.

Serve warm or at room temperature.

The cruciferous family, including cauliflower, is a significant source of cancer-fighting phyto-chemicals, such as indoles and isothiocyanates.

Calories- 96  
Protein- 4g  
Carbohydrates-12g  
Fat- 4g  
Cholesterol-1 mg  
Dietary fiber- 3g  
Saturated fat-1g



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