

August, 2011 Pulmonary Journal Club

The National Lung Screening Research Team. Reduced lung cancer mortality with low dose computed tomographic screening. *N Engl J Med* 2011;365:395-409.

Lung cancer remains the number one cause of cancer related deaths among men and women. It is more fatal than colon, breast and prostate cancer combined. The poor prognosis is largely due to advanced cancer stage at the time of diagnosis. More than 75% of lung cancer cases are diagnosed with a stage 2 or higher and greater than 50% are diagnosed with stage 4. The best prognosis is early stage 1 with a 5 year survival of greater than 65%. Unfortunately the large bulk of early stage 1 cases come as incidental findings when patients receive either a chest x-ray or computerized tomography scan for an unrelated evaluation. Prior studies looking at lung cancer screening with chest x-rays and sputum cytology have not been shown to improve mortality due to poor sensitivity. Prior studies with low dose computed tomography (LDCT) show markedly improved sensitivity when compared to chest x-ray but failed to show improved mortality mainly due to lack of randomization and a control group (1-7). This study performed by the National Lung Screening Research Team was to date the largest randomized, controlled trial looking at low dose computed tomography as a lung cancer screening modality. The study performed from 2002 – 2007 was to determine whether screening with low LDCT improved lung cancer mortality. Inclusion criteria were age 55-74, smoking history of 30 pack/years and former smokers who have quit within the past 15 years. Patients with a prior history of lung cancer or had a LDCT scan within the past 18 months were excluded. A total 53,454 pts were enrolled and with 26732 received screening with a chest x-ray annually for 3 years and 26722 received screening with LDCT annually for 3 years. The results showed that there were significantly more abnormalities detected in the screening LDCT scan and this led to higher rates of evaluation and subsequently showed a 20% reduction in lung cancer mortality. The number needed to screen with LDCT to prevent 1 death from lung cancer was 320 patients. To put this into perspective the number of screening colonoscopies needed to prevent 1 death is 492 and the number of screening mammographies needed to prevent 1 death from breast cancer is 1224 (8). The study was well done and it did accomplish its primary objective. Although the results look promising additional validation is needed before a mass screening program is initiated. Several factors need to be addressed on subsequent studies, mainly who does the radiographic interpretation and a detailed cost analysis. A radiologist with a special interest in chest radiology may need to be designated before a screening program is released. Furthermore we still do not know the long term effects of even low dose radiation. In the accompanying editorial by Harold Sox it was well noted that patients seeking a screening LDCT may also need additional counseling on smoking cessation. Since lung cancer remains for the most part a preventable smoking related illness an equally

aggressive (if not more aggressive) approach to smoking cessation needs to be implemented in conjunction with any screening program.

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References

1. Sone S, Takashima S, Li F, et al. Mass screening for lung cancer with mobile spiral computed tomography scanner. *Lancet* 1998;351:1242-5.
2. Henschke CI, McCauley DI, Yankelevitz DF, et al. Early Lung Cancer Action Project: overall design and findings from baseline screening. *Lancet* 1999;354:99-105.
3. Swensen SJ, Jett JR, Sloan JA, et al. Screening for lung cancer with low-dose spiral computed tomography. *Am J Respir Crit Care Med* 2002;165:508-13.
4. Nawa T, Nakagawa T, Kusano S, Kawasaki Y, Sugawara Y, Nakata H. Lung cancer screening using low-dose spiral CT: results of baseline and 1-year follow-up studies. *Chest* 2002;122:15-20.
5. Sone S, Li F, Yang ZG, et al. Results of three-year mass screening programme for lung cancer using mobile lowdose spiral computed tomography scanner. *Br J Cancer* 2001;84:25-32.
6. Jett JR. Spiral computed tomography screening for lung cancer is ready for prime time. *Am J Respir Crit Care Med* 2001;163:812, discussion 814-5.
7. Diederich S, Wormanns D, Semik M, et al. Screening for early lung cancer with low-dose spiral CT: prevalence in 817 asymptomatic smokers. *Radiology* 2002;222:773-81.
8. Humphrey LL. Breast cancer screening: a summary of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2002;137:347-60.