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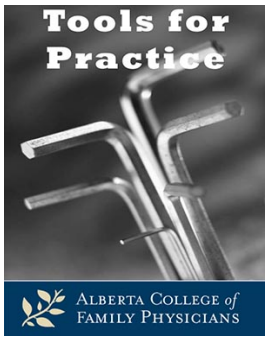
Reviewed: August 5, 2016
Evidence Updated: No new evidence
Bottom Line: No change
First Published: November 26, 2012



Lung Cancer Screening – Low dose CT, High dose False Positives

Clinical Question: Does screening high-risk individuals with low dose CT (LDCT) result in reduced lung cancer mortality?

Bottom Line: Benefit from screening for lung cancer with LDCT has been demonstrated in only one trial, without a "usual care" group. The high number of false positives, which require further, sometimes invasive investigations, is worrisome. Smoking cessation should remain the priority to decrease lung cancer mortality.

Evidence:
National Lung Screening Trial (NLST), 53,454 current or former smokers (at least 30 pack-years), aged 55-74 years without history of cancer. Randomized to three annual screening exams with LDCT or chest x-ray (CXR), followed for an additional five years.[1]

- Lung cancer mortality: 1.3% LDCT versus 1.7% CXR.
  - Number Needed to Screen (NNS)=306 to prevent one lung cancer death over eight years.[2]
- Overall mortality: 7.0% LDCT versus 7.5% CXR, NNS=217.
- Concerns:
  - Amongst the 26,309 patients screened with LDCT, there were a total of 18,146 positive LDCTs.
    - 96.4% of positive LDCTs were false positives.
  - Possible over diagnosis of cancers that would never have become clinically important.
  - No placebo group.

Two smaller Randomized Controlled Trials (RCTs) showed no difference in lung cancer mortality when annual LDCT screening was compared to:

- Baseline CXR and sputum, then yearly medicals.[3]
  - 2472 patients, 34 month follow up: Relative Risk (RR)=0.97 (CI 0.71-1.32).

- Annual questionnaires and lung function testing.[4]
  - 4104 patients, 58 month follow-up: RR=1.15 (CI 0.83-1.61).

Context:

- Screening with CXR does not reduce lung cancer mortality.[5,6]
- Positive LDCTs require further investigations (i.e. additional imaging, bronchoscopy or needle biopsy).[1,3,4,7]
  - Complications of transthoracic needle biopsy include hemorrhage (1%), pneumothorax (15%) and pneumothorax requiring chest tube (6.6%).[8]
- Estimates of LDCT radiation harm: one additional cancer death per 2500 persons screened annually for three years.[9]
- The American Lung Association and others now recommend LDCT screening for high risk individuals.[10,11]
- A 65 year-old male smoker has a 5.9% risk of dying from lung cancer in the next 10 years compared to a 0.4% risk for non-smokers.[12] This risk declines with smoking cessation.[13]

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Tools for Practice is a biweekly article summarizing medical evidence with a focus on topical issues and practice modifying information. It is coordinated by G. Michael Allan, MD, CCFP and the content is written by practising family physicians who are joined occasionally by a health professional from another medical specialty or health discipline. Each article is peer-reviewed, ensuring it maintains a high standard of quality, accuracy, and academic integrity. If you are not a member of the ACFP and would like to receive the TFP emails, please sign up for the distribution list at http://bit.ly/signupfortfp. Archived articles are available on the ACFP website.