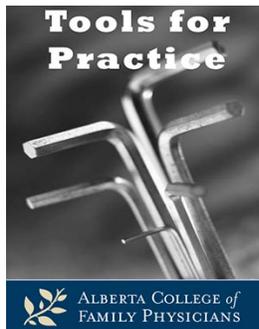


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**November 26, 2012**



## **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?**

### **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 3 annual screening exams with LDCT or chest x-ray (CXR), followed for an additional 5 years.<sup>1</sup>

- Lung cancer mortality: 1.3% LDCT vs 1.7% CXR
  - Number Needed to Screen (NNS) 306 to prevent one lung cancer death over 8 years.<sup>2</sup>
- Overall mortality: 7.0% LDCT vs 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<sup>3</sup>
  - 2472 pts, 34 month follow up: RR 0.97 (CI 0.71-1.32)
- Annual questionnaires and lung function testing<sup>4</sup>
  - 4104 pts, 58 month follow up: RR 1.15 (CI 0.83-1.61)

### **Context:**

- Screening with CXR does not reduce lung cancer mortality.<sup>5,6</sup>

- Positive LDCTs require further investigations (i.e. additional imaging, bronchoscopy or needle biopsy).<sup>1,3,4,7</sup>
  - Complications of transthoracic needle biopsy include hemorrhage (1%), pneumothorax (15%) and pneumothorax requiring chest tube (6.6%).<sup>8</sup>
- Estimates of LDCT radiation harm: 1 additional cancer death per 2500 persons screened annually for three years.<sup>9</sup>
- The American Lung Association and others now recommend LDCT screening for high risk individuals.<sup>10,11</sup>
- 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.<sup>12</sup> This risk declines with smoking cessation.<sup>13</sup>

**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.**

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