



Title	The Clinical Effectiveness and Cost Effectiveness of Computed Tomography Screening for Lung Cancer: Systematic Reviews
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Reference	Health Technol Assess 2006;10(3). January 2006. www.hta.ac.uk/execsumm/summ1003.htm

Aim

To examine the clinical and cost effectiveness of screening for lung cancer using computed tomography (CT) to assist policy making and to clarify research needs.

Conclusions and results

Twelve studies of CT screening for lung cancer were identified, including 2 randomized controlled trials (RCTs) and 10 studies of screening without comparator groups. The quality of reporting in these studies varied, but the overall quality was adequate. The 2 RCTs were short (1 year) and provided no evidence that screening improves survival or reduces mortality. The proportion of people with abnormal CT findings varied widely between studies (5–51%). False positives varied among countries, eg, in the USA there are more nodules due partly to prevalence of histoplasmosis. Hence, the generalizability of studies is an issue. The prevalence of lung cancer detected was between 0.4% and 3.2% (number needed to screen to detect one lung cancer = 31 to 249). Incidence rates of lung cancer were lower (0.1–1% per year). Detection of stage 1 and resectable tumors was high, 100% in some studies. Adverse events were poorly reported. Incidental findings of other abnormalities requiring medical followup were as high as 49%. The review included 6 full economic evaluations of population CT screening programs for lung cancer. The magnitude of cost-effectiveness ratios varied widely. None was set in the UK, and generalization was complicated by wide variation in the data used in different countries and a paucity of UK data for comparison. All 6 made the assumption that CT screening for lung cancer reduced mortality, but the evidence does not support that assumption. Absence of evidence of health gains from screening for lung cancer means that it is not feasible at this time to develop a reliable economic argument for CT screening for lung cancer in the UK. There is evidence of increased risk of lung cancer in some occupational groups, but the role of screening has not been demonstrated by the current studies.

Recommendations

The accepted National Screening Committee criteria are not currently met, with no RCTs, no evidence to support clinical effectiveness, and no evidence of cost effectiveness.

Methods

A systematic review was undertaken, and selected studies were assessed using the checklists and methods described in NHS Centre for Reviews and Dissemination (CRD) Report 4. Separate narrative summaries were done for clinical and cost effectiveness. Cost-effectiveness analysis resulting in a cost per quality-adjusted life-year was not feasible, but the main elements of such an appraisal were summarized and key issues relating to the evidence base were discussed.

Further research/reviews required

RCTs are needed to examine the effect of CT screening on mortality to determine the rate of positive screening and detected lung cancers. Research is needed on the natural history and epidemiology of screening-detected lung cancers, particularly small, well-differentiated adenocarcinomas, and the impact on quality of life. Increased collection is needed of UK health service data regarding resource use and safety data for lung cancer management and services. Research is needed into the feasibility and logistics of tracing people who have worked in industry where they were exposed to lung carcinogens.