Prevention of lung cancer: summary of published evidence
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CRD summary
This review assessed the effect of chemoprevention on the incidence of lung cancer. The authors concluded that no agent has been shown to be effective in preventing lung cancer. The conclusions are in line with the evidence presented but may not be reliable because validity of included studies was not assessed and differences between studies were not investigated.

Authors' objectives
To assess the effect of chemoprevention on the incidence of lung cancer. The authors also reviewed existing systematic reviews of smoking cessation and avoidance interventions; this is not included in this abstract.

Searching
MEDLINE was searched from 1966 to July 2001. HealthSTAR and the Cochrane Library were also searched, but no search dates were provided. The search terms were listed in the paper. The reference lists of identified studies were also checked.

Study selection
Study designs of evaluations included in the review
Phase III randomised controlled trials (RCTs) were eligible for inclusion. Most of the included primary prevention studies were blinded.

Specific interventions included in the review
Studies of chemopreventive agents targeting primary, secondary and tertiary prevention were eligible for inclusion. Primary prevention focuses on treating those people with known risk factors; secondary prevention is used for those people with identifiable precursor lesions; and tertiary prevention is used to treat people who had received treatment for a prior cancer. The included studies used alpha-tocopherol, beta-carotene, retinol, vitamin E and aspirin for primary prevention; beta-carotene, N-acetylcysteine, isotretinoin, or retinol or retinyl palmitate for tertiary prevention.

Participants included in the review
The authors did not specify any inclusion criteria relating to the participants. The primary prevention studies included smokers and non-smokers; the tertiary prevention studies included patients with head and neck and/or lung cancer.

Outcomes assessed in the review
The outcome eligible for inclusion was lung cancer incidence. In the tertiary prevention studies this was defined as a second primary tumour.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.
Methods of synthesis
How were the studies combined?
The authors provided a narrative summary of the findings.

How were differences between studies investigated?
Primary and tertiary prevention studies were grouped separately. The authors did not formally investigate the differences between the studies.

Results of the review
There were five RCTs of primary chemoprevention (n=110,418) and five RCTs of tertiary chemoprevention (n=4,432).

None of the RCTs of primary chemoprevention showed the interventions tested to be effective in preventing lung cancer. In two trials in smokers, beta-carotene was associated with a statistically-significant increased incidence of lung cancer. The beta-carotene arm of one other trial was terminated early due to the association of an increased incidence of lung cancer in the aforementioned trials. The two remaining trials showed no difference between beta-carotene and placebo or retinol.

No RCTs of secondary chemoprevention interventions were identified.

Two small RCTs investigating tertiary chemoprevention interventions found a decrease in the incidence of second primary cancer when using isotretinoin and retinol palmitate; however, this effect was not shown in two subsequent larger trials. One RCT of beta-carotene was terminated early due to the detrimental findings reported in the primary prevention studies (outlined above).

Authors’ conclusions
The authors concluded that no agent has been proven to be effective in preventing lung cancer. However, there was evidence that beta-carotene, alone or in combination with retinol, increases the incidence of lung cancer among smokers.

CRD commentary
Other than the outcome of interest, the inclusion criteria were broad and the method used to select studies for inclusion was not described, so there is no assurance that the selection was unbiased. The validity of the included studies was not fully assessed, and the authors appear to have relied on study size to indicate reliability. The potential impact of bias in the primary studies on the findings of the review is, therefore, uncertain.

The authors’ conclusions appear to be supported by the evidence presented. However, the authors do not appear to have adequately investigated whether differences in the findings between studies might be due to the participant characteristics or the chemoprevention regimens used.

Implications of the review for practice and research
The authors did not state any implications for practice or further research.

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Bibliographic details
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.