Screening for chronic obstructive pulmonary disease using spirometry: summary of the evidence for the U.S. preventive services task force


CRD summary
This review assessed the efficacy and safety of screening for chronic obstructive pulmonary disease using spirometry. The authors concluded that there was no direct evidence that screening improves long-term health outcomes and no evidence of adverse events except the potential for false positives. These conclusions accurately reflect the results of the review and, despite a limited search, are probably reliable.

Authors' objectives
To assess the evidence on screening for chronic obstructive pulmonary disease using spirometry. The review addressed a large number of questions, of which two are within the scope of this abstract: the impact of screening for chronic obstructive pulmonary disease with spirometry on morbidity and mortality; and the adverse effects of such screening.

Searching
MEDLINE and the Cochrane Library were searched from 1966 to December 2006. Search terms were reported. References were checked and experts were contacted. Only studies reported in English were eligible for inclusion.

Study selection
For the efficacy question, randomised or quasi randomised controlled trials (RCTs) that compared a screened and unscreened samples of patients with chronic obstructive pulmonary disease and reported morbidity or mortality outcomes, were eligible for inclusion. For the adverse effects question, studies that assessed spirometry testing, in either an office setting or a pulmonary function laboratory, and addressed harms or test characteristics of spirometry in patients, were eligible for inclusion. Studies which included only a population sample without chronic obstructive pulmonary disease or which were isolated case reports of spirometry-induced pneumomediastinum, bronchial obstruction or incarcerated inguinal hernia were excluded.

Studies included for the adverse effects question included participants referred to a pulmonary function laboratory, a general population excluding patients with known respiratory problems, and healthy adults.

Two reviewers independently assessed the studies for inclusion in the review.

Assessment of study quality
The studies were independently assessed for validity by two reviewers using the criteria of the U.S. Preventative Services Task Force which assessed factors appropriate to particular study designs.

Data extraction
It appears that two reviewers were involved in the extraction of data. It is not clear how disagreements were resolved.

Methods of synthesis
Studies were combined in a narrative synthesis, supported by evidence tables.

Results of the review
None of the studies reported any evidence of any clinically significant adverse events, with one study finding no evidence of increased cardiac ectopy using echocardiographic monitoring. However, the data suggested that potential false-positive results occurred in healthy asymptomatic individuals. One study (n=251) reported that 10% of healthy adults had at least one abnormal spirometric result, while another (n=208) found that 35% of healthy adults aged over 70 years, and 50% aged over 80 years, were diagnosed with chronic obstructive pulmonary disease on the basis of spirometry testing.
Authors' conclusions
There was no direct evidence that screening patients for chronic obstructive pulmonary disease using spirometry improves long-term health outcomes. Adverse effects were likely to be limited to some false positive results among adult smokers and these usually minor events are associated with subsequent pharmacotherapy. Screening for chronic obstructive pulmonary disease using spirometry was likely to identify a predominance of patients with mild to moderate airflow obstruction, who would not benefit from being labelled as having chronic obstructive pulmonary disease. Hundreds of patients would require screening to identify one person with chronic obstructive pulmonary disease, for whom the incremental health benefit is likely to be limited.

CRD commentary
The review questions were clear and were supported by specific inclusion criteria. The search included two relevant databases but the decision to restrict the review to studies reported in English, and the failure to systematically search for unpublished studies, may have led to the introduction of language or publication bias. The authors used methods designed to reduce bias and error at each stage of the review process, and used an appropriate tool to assess study validity. The decision to employ a narrative synthesis was appropriate given the clinical differences between the studies. The authors’ cautious conclusions accurately reflect the limited evidence available, although false positives and numbers needed to screen were inferred by the authors rather than calculated from diagnostic accuracy studies, which were unavailable. Although this and the limited search should be borne in mind, these conclusions are probably reliable.

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

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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.