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Lung Cancer Screening: Clinical Utility and Guidelines

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Authors: Holly Gunn, Lory Picheca

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Research Questions

1. What is the clinical utility of screening for lung cancer in the general adult population?
2. What is the clinical utility of screening for lung cancer in adults at high risk of lung cancer?
3. What are the evidence-based guidelines regarding screening for lung cancer?

Key Findings

Five health technology assessments, 10 systematic reviews (six with meta-analyses), and 14 randomized controlled trials were identified regarding the clinical utility of screening for lung cancer in adults at high risk of lung cancer. Ten evidence-based guidelines were identified regarding screening for lung cancer. No literature was identified regarding the clinical utility of screening for lung cancer in the general adult population.

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were lung neoplasms and mass screening. Search filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, or network meta-analyses, randomized controlled trials or controlled clinical trials and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2015 and September 22, 2020. Internet links were provided, where available.

Selection Criteria

One reviewer screened literature search results (titles and abstracts) and performed limited handsearching, and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. Open access full-text versions of evidence-based guidelines were reviewed when abstracts were not available.

Table 1: Selection Criteria

Population	Q1,3: General adult population Q2,3: Adults at high risk of lung cancer (e.g., diagnosis of emphysema, smoking history, exposure to asbestos, radon gas)
Intervention	Q1-3: Any lung cancer screening method (e.g., low-dose computed tomography, thorax radiography, sputum cytology, positron-emission tomography, biomarkers)
Comparator	Q1,2: A different lung cancer screening method; no screening Q3: Not applicable

Outcomes	Q1,2: Clinical utility (e.g., all-cause mortality, morbidity, time to diagnosis and treatment, quality of life), and safety (e.g., harms of screening test, consequences of false positives and false negatives, overdiagnosis) Q3: Recommendations regarding lung cancer screening.
Study Designs	Health technology assessments, systematic reviews, randomized controlled trials, evidence-based guidelines

Results

Five health technology assessments,¹⁻⁵ 10 systematic reviews⁶⁻¹⁵ (six with meta-analyses^{6,9-11,13,15}), and 14 randomized controlled trials¹⁶⁻²⁹ were identified regarding the clinical utility of screening for lung cancer in adults at high risk of lung cancer. Ten evidence-based guidelines³⁰⁻³⁹ were identified regarding screening for lung cancer. No literature was identified regarding the clinical utility of screening for lung cancer in the general adult population.

Additional references of potential interest that did not meet the inclusion criteria are provided in the appendix.

Health Technology Assessments

Low-Dose Computed Tomography (LDCT)

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Systematic Reviews and Meta-analyses

Low-Dose Computed Tomography (LDCT)

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Multiple Screening Methods

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Randomized Controlled Trials

Low-Dose Computed Tomography (LDCT)

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Multiple Screening Methods

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Biomarkers

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Guidelines and Recommendations

Biomarkers

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Multiple Screening Methods

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Appendix — Further Information

Previous CADTH Reports

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Systematic Reviews & Meta-analyses

No Comparator

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Meta-analyses without a Systematic Review

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Unclear Comparator

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Unclear Methodology

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Randomized Controlled Trials

Alternative Outcomes

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Alternative Comparators

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Alternative Outcomes

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Guidelines and Recommendations

Unclear Methodology

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