

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Pulmonary Function Testing: Guidelines

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Research Question

What are the evidence-based guidelines regarding the use of pulmonary function testing?

Key Findings

Five evidence-based guidelines were identified regarding the use of pulmonary function testing.

Methods

A limited literature search, with main concepts appearing in title or major subject heading, was conducted on key resources including Ovid Medline, PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases and a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses and guidelines. The search was limited to English language documents published between January 1, 2013 and May 15, 2018. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	Patients requiring pulmonary function assessment (one-time or serial exams) (e.g., patients with COPD, asthma, interstitial lung diseases, lung transplants)
Intervention	Pulmonary function testing (e.g., spirometry, lung volumes, oxygen desaturation during exercise [i.e., six-minute walk test], arterial blood gas sampling)
Comparator	No comparator
Outcomes	Evidence-based guidelines
Study Designs	Health technology assessments, systematic reviews, meta analyses, evidence-based guidelines

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Normally, health technology assessment reports, systematic reviews, and meta-analyses are presented first; however, in reports where guidelines are primarily sought, the aforementioned evidence types are presented in the appendix.

Five evidence-based guidelines were identified regarding the use of pulmonary function testing.

Relevant systematic reviews and meta-analyses, along with additional references of potential interest, are provided in the appendix.

Overall Summary of Findings

Five evidence-based guidelines¹⁻⁵ were identified regarding the use of pulmonary function testing.

Guidance from the National Institute for Health and Care Excellence (NICE) for patients with chronic obstructive pulmonary disease (COPD) in adults¹ states that patients over the age of 35 who present with at least one risk factor and one or more symptoms of COPD should receive post-bronchodilator spirometry for diagnostic purposes. In order to assess whether patients with stable chronic COPD and a “persistent resting stable oxygen saturation level of 92% or less”¹ receive long-term oxygen therapy, NICE recommends having their arterial blood gases measured.¹

The United States (US) Preventative Services Task Force recommends against COPD screening for asymptomatic adults (D grade of evidence).² Screening spirometry administered without the use of a bronchodilator followed by diagnostic spirometry testing is recommended for patients in primary care who are positive using a prescreening risk-assessment questionnaire for COPD.² The guidelines also recommend that patients assessed as high risk for COPD using the prescreening questionnaire or screening spirometry should be referred for diagnostic spirometry testing.²

The US Department of Veterans Affairs and Defense (VA/DoD) recommends that spirometry be used to demonstrate an obstruction of airflow (“post-bronchodilator forced expiratory volume in one second/forced vital capacity [FEV1/FVC] <70%, with age adjustment for more elderly individuals”³) for the confirmation of an initial diagnosis of COPD.³

The American Association for Respiratory Care (AARC) recommends blood gas analysis and hemoximetry be used to monitor the severity and progression of cardiopulmonary disease and a patient’s response to therapy, to evaluate their ventilatory, oxygenation, and acid-base status, and to determine the consumption of oxygen in the “setting of early goal-directed therapies.”⁴ Capillary blood gas analysis is not recommended for the assessment of oxygenation status.⁴

The American Thoracic Society suggests that spirometry testing every two to three years should be sufficient to monitor for the development of chronic respiratory diseases (such as COPD and pneumoconioses) in the occupational setting; however, the same does not apply to more rapidly developing respiratory diseases (such as occupational asthma).⁵ In such circumstances, six-month to one year intervals may be more appropriate.⁵ In addition,

spirometry measurements should be examined relative to the worker's baseline spirometry values or prior test values, along with normal population ranges.⁵

References Summarized

Guidelines and Recommendations

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See: Quality statement 1: Diagnosis with spirometry, pages 14-17
Quality statement 3: Assessment for long-term oxygen therapy, pages 22-24
2. Guideline summary: Final recommendation statement: chronic obstructive pulmonary disease: screening. In: National Guideline Clearinghouse [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2016 Apr [cited 2018 May 28]. Summary available from: <https://www.guideline.gov/summaries/summary/50139/final-recommendation-statement-chronic-obstructive-pulmonary-disease-screening?q=pulmonary+function+test>
See: Summary of Recommendation and Evidence: Screening Tests
3. The Management of Chronic Obstructive Pulmonary Disease (COPD) Working Group. VA/DoD clinical practice guideline for the management of chronic obstructive pulmonary disease [Internet]. Washington D.C.: U.S. Department of Veteran Affairs, Department of Defense; 2014 Dec [cited 2018 May 28]. Available from: <https://www.healthquality.va.gov/guidelines/CD/copd/VADoDCOPDCPG2014.pdf>
See: Recommendation 1, page 16
Diagnosis and Assessment of COPD, pages 22-23
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Occupational Setting

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Appendix — Further Information

Previous CADTH Reports

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Systematic Reviews and Meta-Analyses

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[PubMed: PM29605218](#)
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Mixed Population

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Guidelines and Recommendations

Technical Summary

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Technical Standards

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See: Major Recommendations

Clinical Practice Guidelines – Methodology Not Reported

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See: Investigations or Tests, page 3
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See: Chapter 8 6-Minute Walk Test (6MWT), pages 41-46
Chapter 15 Cardiopulmonary Exercise Test (Stage 1), pages 95-104
Chapter 17 Arterial Blood Sampling, Blood Gas Analysis and Hemoximetry, pages 113-116

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Position Statements

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Non-Specified Population

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