UK National Screening Committee

SCREENING FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN THE GENERAL ADULT POPULATION

An evidence map to outline the volume and type of evidence related to screening for chronic obstructive pulmonary disease in the general adult population for the UK National Screening Committee

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The UK National Screening Committee secretariat is hosted by the Department of Health and Social Care

Contents

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Conditions are reviewed against evidence review criteria according to the UK NSC's evidence review process.

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Summary

This document discusses the findings of the evidence map on screening for chronic obstructive pulmonary disease (COPD) in the general adult population.

Evidence maps are a way of scanning published literature to look at the volume and type of evidence in relation to a specific topic. They inform whether the evidence is sufficient to commission a more sustained analysis on the topic under consideration.

The findings of this evidence map are unlikely to alter the current recommendation on screening for COPD in the general adult population. Little robust evidence was identified addressing the benefits of COPD screening on health outcomes, and therefore further evidence synthesis work on this question is unlikely to lead to a conclusive answer to this question.

Regarding the effect of COPD screening on smoking cessation, two meta-analyses suggested a potential (though not definitive) effect, while individual studies showed mixed results, possibly due to lack of statistical power. Further evidence synthesis work, including meta-analysis to address the lack of power in individual studies, may provide more conclusive evidence regarding the effect of lung function feedback on smoking cessation rates. Further primary research on targeted COPD screening in current and former smokers may be valuable.

However, further synthesis work on smoking cessation on its own would be unlikely to lead to a change in the UK NSC's current position. Therefore, a full update review is not recommended at this stage, and so this topic should be re-considered in 3 years' time.

Introduction and approach

Background and objectives

Background

The UK NSC external reviews (also known as evidence summaries or evidence reviews) are developed in keeping with the UK NSC evidence review process to ensure that each topic is addressed in the most appropriate and proportionate manner. Further information on the evidence review process can be accessed online.

Screening for COPD in the general adult population is a topic currently due for an update external review.

COPD

COPD is a group of progressive lung conditions characterised by inflammation and irreversible damage to pulmonary air passages that gradually reduces airflow into the lungs (1). Chronic bronchitis and emphysema are the two most common conditions in the group, and together, are the fifth leading cause of death in the UK. The prevalence of COPD remains uncertain but the previous UK NSC review suggested that up to 3 million people in the UK are affected, and approximately two thirds of this population remain undiagnosed (2). The main symptom of COPD is increasing breathlessness when active. Persistent coughs with phlegm are common; however, airflow obstruction without symptoms is also common. If left untreated, the conditions will progressively impair quality of life, resulting in long-term disabilities and increased mortality. Smoking tobacco has been shown to be the main cause of COPD and is responsible for 80-90% of cases. Epidemiological studies have found that 15-50% of all smokers will develop COPD (3).

It has been estimated that 70-90% of individuals with COPD worldwide remain undiagnosed (4). Possible reasons for underdiagnosis include: patients adapting their activities to minimise symptoms; breathlessness being seen as a part of aging; shame associated with smoking; cases of mild disease with minimal symptoms; lack of time and funding within primary care; and underuse of confirmatory spirometry (4).

Tests for COPD

The function of a national screening programme would be to identify people with COPD when the disease is in an asymptomatic or unrecognised stage, and to offer treatments and interventions to reduce the rate of lung function deterioration. Tests for COPD include lung (pulmonary) function tests such as spirometry; risk assessment questionnaires; and combinations of these.

Management of COPD

In terms of management, encouragement to quit smoking is the primary intervention recommended by NICE for COPD. Oral and inhaled pharmacological therapies can reduce exacerbations in moderate-to-severe COPD. COPD patients are also recommended to receive pneumococcal and annual influenza vaccinations.

Previous review on screening for COPD in the general adult population

Previous UK NSC review

Currently, the UK NSC recommends against screening for COPD in the general adult population (https://view-health-screening-recommendations.service.gov.uk/copd/). The Committee based this recommendation on the evidence provided by the 2018 evidence summary carried out by Solutions for Public Health (3).

The 2018 review considered four key questions, and included evidence from studies published between February 2012 and November 2017. The first question assessed accuracy of screening tests for COPD. The review concluded that risk assessment questionnaires gave a high number of false positives, while pulmonary function tests (alone or in combination with questionnaires) may reduce the false positive rate, but studies were small with considerable variation in populations, tests, cut-offs and results. The second question assessed the impact of screening on smoking cessation rates; one randomised controlled trial (RCT) and three uncontrolled cohort studies were included. Overall there was uncertainty about the impact of spirometry or a COPD diagnosis on smoking cessation rates. The third question assessed the clinical effectiveness of pharmacological treatments in screen-detected COPD. No studies were identified in screen-detected populations, and there was a lack of evidence on pharmacological interventions in people with milder COPD. The fourth question assessed the impact of COPD screening on mortality, morbidity or health-related quality of life (HRQoL). One cluster RCT assessed screening versus usual care in a frail elderly population, and did not demonstrate an advantage for screening, but significance tests were not reported and the population may not be generalisable to population screening. Overall the review found insufficient evidence to recommend screening for COPD.

Other recent reviews and guidelines

In the UK, diagnosing and managing COPD is covered by NICE guideline NG115, but this guideline does not cover screening or case-finding (5). The United States Preventive Services Task Force (USPSTF) evidence review in 2016 did not recommend screening for COPD due to a lack of evidence that screening in asymptomatic people alters the course of disease or improves patient outcomes (6). A USPSTF targeted evidence update in 2022 concluded that there were still no comparative studies on the effectiveness of screening or active case-finding for COPD on patient health outcomes, and that there was little evidence for a benefit of pharmacologic or non-pharmacologic interventions in people with mild COPD (7).The USPSTF 2022 recommendation statement concluded with moderate certainty that screening for COPD in asymptomatic adults has no net benefit, and therefore recommended against screening for COPD in this group. Asymptomatic adults were defined as those who do not recognise or report respiratory symptoms; this recommendation does not apply to people who present to clinicians with respiratory symptoms (8).

Aims of the evidence map

Evidence maps are rapid evidence products which aim to gauge the volume and type of evidence relating to a specific topic.

This evidence map has been developed to assess whether a more sustained review on screening for COPD in the general adult population should be commissioned and to evaluate the volume and type of evidence on key issues related to screening for COPD in the general adult population. The aim of this document is to present the information necessary to inform UK NSC decision-making processes.

The aim was to address the following questions:

1. **Question 1:** What is the volume and type of evidence on the effect of screening for COPD in previously undiagnosed adults on morbidity, mortality and health-related quality of life?
2. **Question 2:** What is the volume and type of evidence on the effect of screening for COPD in previously undiagnosed adults on smoking cessation rate?

Search methods and results

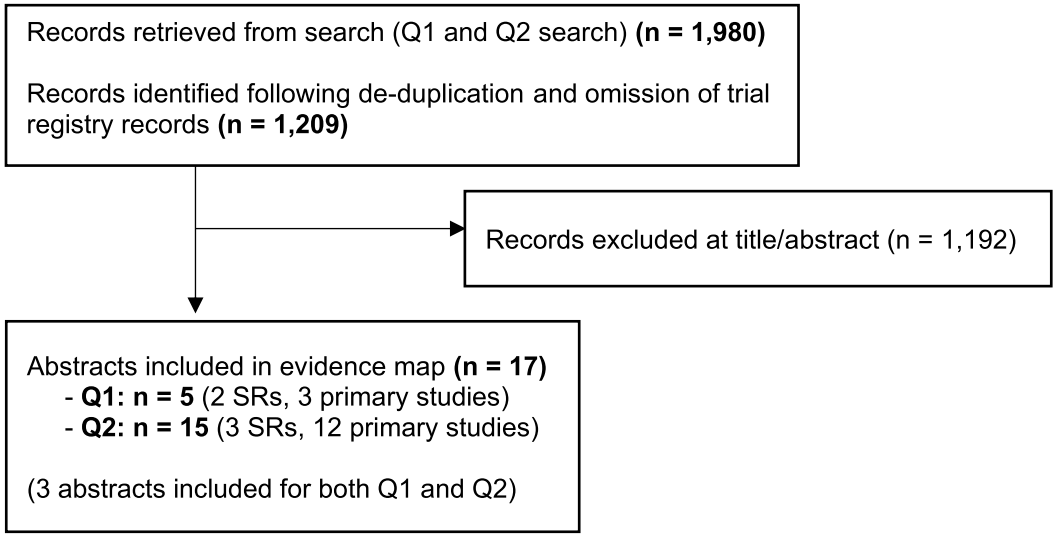
Overview of searches

The searches were conducted on 15th July 2025 on the following databases: Ovid MEDLINE, Ovid EMBASE, Cochrane Database of Systematic Reviews and Cochrane Central Register of Controlled Trials. The search strategy for Question 1 combined the following search concepts: COPD AND specific tests AND screening/case-finding AND outcomes. The search strategy for Question 2 combined the following search concepts: smoking cessation AND specific tests, OR smoking cessation AND COPD AND screening or case-finding in the title. Results of both searches were limited to English language, human studies and the year 2017 onwards, and non-relevant publication types excluded. The detailed search strategies are available in Appendix 1.

Results for Q1 and Q2 were screened as a single batch. The first 100 titles and abstracts were screened by two reviewers, then checked for consistency of inclusion decisions. The remaining titles and abstracts were each screened by single reviewer. All included references were checked for inclusion by a second reviewer. Full texts were only obtained and consulted where the abstract suggested that the study was likely to meet the inclusion criteria and to report relevant data such as mortality, morbidity, HRQoL or smoking cessation rate, but where insufficient information was available from the abstract to either assess eligibility or extract data. Where relevant outcome data were reported in the abstract, full texts were not routinely checked for additional data. A formal quality appraisal of the evidence was not required, given the remit of the evidence map. Data were extracted by one reviewer and numerical data checked by a second reviewer. Summary tables of the study characteristics and results are available in Appendix 2.

The searches returned 1,980 results. After de-duplication and omission of trial registry records, 1209 unique references were checked for relevance. In total, 5 references for Q1 (2 systematic reviews and 3 primary studies) and 15 references for Q2 (3 systematic reviews and 12 primary studies) were included in the final evidence map. A flow diagram summarising the number of studies included and excluded is presented in Figure 1.

Figure 1: PRISMA flow diagram of study selection



Overview of inclusion criteria

The detailed inclusion and exclusion criteria are available in Appendix 1.

Both Q1 and Q2 included studies of COPD screening in asymptomatic populations (defined as those who do not recognise or report respiratory symptoms) conducted in the UK or similar countries, and published since November 2017. Screening could cover general populations, or be restricted by age group, or cover targeted populations e.g. based on smoking history. Studies of case-finding were included where this was considered to be synonymous with screening. Relevant screening tests included risk assessment questionnaires, lung function tests such as spirometry, or combinations of these.

For Q1 (effect of COPD screening on morbidity, mortality and health-related quality of life), the included study types were restricted to RCTs, other studies with a control group, and systematic reviews of these; single-arm studies were excluded.

For Q2 (effect of COPD screening on smoking cessation), both controlled and uncontrolled studies, and systematic reviews of these, were included. This question included both studies of COPD screening and studies assessing the impact of feedback to patients about results of spirometry or other lung function assessments on smoking cessation (whether or not in a screening setting).

Summary of findings

Question 1: Effect of screening for COPD on morbidity, mortality and health-related quality of life

Volume and type of evidence for Q1

For Q1 (effect of screening for COPD on morbidity, mortality and HRQoL), five references were included: two systematic reviews (7, 9) and three primary studies (10-12). Summary tables are provided in Appendix 2; Table 1 presents the characteristics and results of systematic reviews, while Table 2 and Table 3 present the characteristics and results of primary studies.

Systematic reviews for Q1

Two systematic reviews were included for Q1 (Table 1). Both reviews aimed to update the 2016 US Preventive Services Task Force (USPSTF) review on screening for COPD (6). The review by Webber et al, 2022 (7) was conducted by the USPSTF while the review by Choi et al., 2022 (9) was conducted by a different group. The search date was 2021 for Webber et al. and 2020 for Choi et al. For the question on effect of COPD screening on health outcomes, Webber et al. sought RCTs of any screening test for COPD in asymptomatic adults, while Choi et al. sought RCTs and systematic reviews of spirometry in asymptomatic adults aged over 40 years.

Neither systematic review identified any RCTs assessing the effect of COPD screening on health outcomes. Both reviews concluded that there was no trial evidence for effectiveness of COPD screening on health outcomes.

Primary studies for Q1

The current review for Q1 was restricted to studies with a control group (randomised or non-randomised). Three RCTs or cluster RCTs were included (Table 2 and Table 3). All three used targeted screening or targeted case-finding to identify people with undiagnosed COPD, then randomised these people to enhanced care or usual care.

An RCT in Canada by Aaron et al., 2024 (10) used random digit dialling to identify people with respiratory symptoms, who were then screened via the COPD Diagnostic Questionnaire (CDQ) plus spirometry, and those found to have COPD or asthma were randomised to enhanced care or usual care. The CAPTURE study was a cluster RCT conducted in the USA by Martinez et al., 2025 (11), in which primary care practices were randomised to use of the CAPTURE tool to identify and manage new COPD patients versus usual care. Finally, a secondary analysis of a cluster RCT in Australia by Petrie et al., 2024 (12) used case-finding within primary care practices to identify people with potential COPD (on the basis of age and smoking history), who were then screened via spirometry, questionnaires and other methods, and new COPD cases randomised to enhanced care or usual care.

Effect of screening for COPD on mortality

No studies reported the effect of screening for COPD on mortality.

Effect of screening for COPD on morbidity and health-related quality of life

All three RCTs reported the effects of screening for COPD, followed by randomisation to enhanced care or usual care, on morbidity and HRQoL. Reported outcomes included: COPD Assessment Test (CAT) scores; St. George Respiratory Questionnaire (SGRQ) scores; SF-36

scores; forced expiratory volume in 1 second (FEV-1) results; and rates of respiratory illnesses, healthcare visits and hospitalisations.

In the RCT by Aaron et al. (10), a total of N=258 patients were randomised, and between-group differences were statistically significant for some outcomes but not for others. There was a significantly better FEV-1 in the enhanced care group, but no significant difference in the CAT score, SGRQ score, or SF-36 (though all trends favoured the enhanced care group). There was a significant difference in total healthcare visits and primary care visits for respiratory illness, but no significant difference in hospitalisations, emergency department visits or specialist visits for respiratory illness (all showed a trend for being lower in the enhanced care group). The authors concluded that those who received pulmonologist-directed treatment (following screening) had less subsequent health care utilisation for respiratory illness than those receiving usual care.

In the CAPTURE cluster RCT by Martinez et al. (11), a total of N=387 patients were analysed. There was no significant difference in CAT score (trend favoured enhanced care group), and no significant difference in acute respiratory illnesses or hospitalisations for respiratory illness (trends favoured the comparator group). The authors concluded that use of CAPTURE scores did not significantly change outcomes for CAPTURE-positive patients, but noted possible effects of the COVID-19 pandemic on study conduct.

In the cluster RCT by Petrie et al. (12), a total of N=98 patients were analysed. There was no significant difference in CAT score or mMRC breathlessness score (trend favoured comparator for both) or in the SGRQ score (trend favoured enhanced care). The authors concluded that the study was not sufficiently powered to demonstrate an effect.

Effect of screening for COPD on test uptake

No studies reported explicitly on test uptake. The RCT by Aaron et al. (10) reported the numbers of patients at each stage as follows: 20% engaged with the automated screening telephone call; 78% of those potentially eligible were later reached by telephone; 67% of those eligible had spirometry; and 85% of those with COPD or asthma agreed to randomisation.

Comparison to previous UK NSC evidence summary

The 2018 UK NSC evidence summary (3) also included a question on the impact of COPD screening on mortality, morbidity or HRQoL. The review identified one cluster RCT assessing screening versus usual care in a frail elderly population, which did not demonstrate an advantage for screening, but significance tests were not reported and the population may not be generalisable to population screening. Overall the previous evidence summary found insufficient evidence to recommend screening for COPD.

Summary of evidence for Q1

This evidence map identified two systematic reviews for Q1; however, neither review identified any RCTs addressing the effect of COPD screening on health outcomes. This map also identified three RCTs in which screening or case-finding was used to identify people with undiagnosed COPD, who were then randomised to enhanced care or usual care. Reported outcomes included: CAT scores; SGRQ scores; SF-36 scores; FEV-1 results; and rates of respiratory illnesses, healthcare visits and hospitalisations. No studies reported mortality. Some analyses showed a significant benefit in the enhanced care group, but the majority of analyses did not show a significant difference (though most showed a trend favouring the enhanced care group). Two studies concluded that they had not demonstrated a significant effect of COPD screening on health outcomes, with one study noting a lack of statistical power and the other noting the effect of the pandemic on study results, while the third study concluded that

enhanced treatment following COPD screening reduced health care utilisation for respiratory illness compared with usual care.

Conclusions for Q1

In summary, this evidence map did not identify robust evidence on the benefits of COPD screening on health outcomes. There is currently insufficient evidence to support commissioning further evidence synthesis work on this question, and further evidence synthesis would be unlikely to change the UK NSC's current position.

Question 2: Effect of screening for COPD on smoking cessation rate

Volume and type of evidence for Q2

For Q2 (effect of screening for COPD on smoking cessation), 15 references were included: three systematic reviews (9, 13, 14) and 12 primary studies (10, 12, 15-24). Summary tables are provided in Appendix 2; Table 4 and Table 5 present the characteristics and results of systematic reviews, while Table 6 and Table 7 present the characteristics and results of primary studies.

Systematic reviews for Q2

Three systematic reviews were included for Q2 (Table 4 and Table 5), all assessing the effect of spirometry feedback on smoking cessation (9, 13, 14). All three reviews restricted inclusion to RCTs (or RCTs and systematic reviews). The search dates for the three reviews were 2020 (9), 2018 (13) and 2017 (14), and the included RCTs were published between 1985 and 2017.

Choi et al., 2022 (9) reported a systematic review and meta-analysis of seven RCTs which showed no significant effect of spirometry feedback on smoking cessation, though the trend favoured spirometry feedback (relative risk [RR] 1.21, 95% confidence interval [CI] 0.87 to 1.67). However, a subgroup analysis of four RCTs providing smoking cessation medicines or intensive counselling did show a significant benefit of spirometry feedback (RR 1.58; 95% CI 1.14 to 2.19). The review concluded that the effect of COPD screening on smoking cessation was only present when using medications or intensive counselling.

Clair et al., 2019 (13) reported a Cochrane systematic review and meta-analysis of 11 RCTs, nine of which used spirometry feedback (the other two used carotid ultrasound). There was a trend for an effect on smoking cessation which narrowly missed statistical significance (RR 1.26; 95% CI: 0.99 to 1.61). However there was a significant effect in a sensitivity analysis of eight RCTs at lower risk of bias (RR 1.36; 95% CI: 1.07 to 1.74). The review concluded that there was moderate-certainty evidence for the effect of spirometry on smoking cessation.

Westerdahl et al., 2019 (14) reported a systematic review in which two RCTs showed significant improvement in smoking cessation with feedback on spirometry results while the other five RCTs showed no significant difference; however this review was limited by an absence of meta-analysis.

In terms of overlap between the reviews, 13 individual RCTs of spirometry were identified across the three reviews. Of these, four RCTs were included in both meta-analyses (Choi et al. (9) and Clair et al. (13)). Two RCTs were included in all three reviews, eight RCTs were included in two reviews, and three RCTs were only included in one review each.

In summary, the three systematic reviews suggested some effect of spirometry feedback on smoking cessation, but this was only significant when restricting to high-quality studies or to studies of medications or intensive counselling.

Primary studies for Q2

The current review for Q2 included both controlled studies and single-arm studies. Nine RCTs and three single-arm studies were included, all assessing the effect of feedback about spirometry or lung function results on smoking cessation rates (Table 6 and Table 7). Some studies used screening or case-finding to identify people with undiagnosed COPD, while others simply included current smokers. The included RCTs randomised people to feedback on results

of spirometry or other lung function test versus no feedback (often, both groups also received smoking cessation advice), while the single-arm studies provided participants with feedback on results of spirometry or other lung function assessments but had no comparator group.

RCTs

An RCT in Canada by Aaron et al., 2024 (10) used random digit dialling to identify people with respiratory symptoms, who were then screened via the COPD Diagnostic Questionnaire (CDQ) plus spirometry, and those found to have COPD or asthma were randomised to enhanced care or usual care. Current smokers in both groups received smoking cessation counselling and referral to smoking cessation programs, while the intervention group were offered pharmacologic therapy for smoking cessation. Smoking cessation was higher in the intervention group, but no significance test was reported.

An RCT by Dahne et al., 2022 (17) identified smokers, who were screened using the CAPTURE tool, then randomised to enhanced care versus usual care. Enhanced care consisted of smoking cessation e-visits similar to an electronic questionnaire, where participants were asked about smoking history and motivation to quit, then recommended personalised smoking cessation medications. All smoking cessation outcomes favoured e-visits over usual care, with significant effects for quit attempts with medication use (OR=3.96) and smoking reduction (OR=3.09). The trial concluded that e-visits may offer a feasible approach for smoking cessation and COPD screening.

An RCT conducted in Spain by Jaen-Moreno et., 2021 (19) identified smokers with severe mental illness and screened 160 patients with spirometry, then randomised them to feedback on spirometry results versus usual care. Smoking cessation outcomes mainly favoured the intervention group, but the between-group difference was not significant.

The ESPITAP study by Martin-Lujan et al., 2021 (20) identified active smokers visiting primary healthcare centres and subjected them to screening via spirometry then randomised to full feedback on spirometry results versus basic spirometry feedback. The results significantly favoured the intervention group in terms of smoking cessation outcomes.

The RESET study by Martin-Lujan et al., 2023 (21) recruited active smokers and screened them via spirometry, then randomised them to spirometry feedback or none. The trial concluded that prolonged abstinence rates were significantly greater in the intervention group.

An RCT conducted in France by Perisse et al., 2024 (22) recruited French military smokers and screened them via spirometry, then randomised them into enhanced care with feedback on spirometry results plus counselling or usual care with minimal counselling. Smoking cessation rates were determined via telephonic interviews at 6 and 12 months. The trial did not show any significant effect of spirometry feedback between the groups.

Secondary analysis of cluster RCT by Petrie et al., 2024 (12) used case-finding to identify current or former smokers and screened them via handheld COPD-6 screening device plus RADICALS questionnaire. If they met the threshold then spirometry, CAT assessment and mMRC questionnaire were performed. Patients were then randomised to enhanced care including smoking cessation support or usual care. However, the study concluded that no significant difference was observed between two groups and that the study was insufficiently powered to reach a conclusive result.

Rodiguez-Alvarez et al., 2022 (23), an RCT in Spain, recruited active smokers and screened them via spirometry then randomised them to repeated spirometry feedback versus feedback at baseline only. Smoking cessation rates were numerically higher in the intervention than control

group; between-group differences were not significant at 1 year or 2 years but were significant in an analysis across timepoints. The study concluded that regular feedback of spirometry results increases the likelihood of smoking cessation.

Ronaldson et al., 2018 (24) conducted a nested RCT within a case-finding cohort in the UK. The study recruited patients from database and opportunistic recruitment from general practice and screened them via lung function assessment, clinical history, wheezometer, peak flow meter, microspirometry, relaxed vital capacity and forced vital capacity pre-bronchodilator spirometry and symptom questionnaire. The participants were then randomised to lung health results plus smoking cessation advice versus smoking cessation advice alone. Smoking cessation was slightly higher in the control group and the trial concluded that there was no evidence of effect of lung function tests on smoking cessation among smokers.

Single-arm studies

A single arm-study in the UK, by Bradley et al., 2023 (15) identified current or past smokers as a part of a lung cancer screening trial and screened them using low-dose CT plus spirometry alongside providing smoking cessation counselling. The study concluded that 20% successfully quit smoking and that patients may significantly benefit from spirometry to facilitate early diagnosis of COPD.

Clergue-Duval et al., 2020 (16) conducted a retrospective single-arm study in France, investigating effects of spirometry feedback on smoking cessation and motivation to quit. The smoking abstinence rate and motivation to quit (Q-MAT) score were greater in those with COPD or abnormal lung age than in those with normal spirometry results, suggesting spirometry feedback as a useful tool for smoking cessation, though no significance tests were reported.

The UNAIME pilot study by Hourmant et al., 2021 (18) used case-finding to identify current smokers who were then screened via questionnaire plus spirometry and received smoking cessation counselling. Participants showed a 14% quit rate and 43% engagement in a smoking cessation program.

Comparison to previous UK NSC evidence summary

The 2018 UK NSC evidence summary (3) also included a question on the impact of COPD screening on smoking cessation. The review identified one RCT and three uncontrolled cohort studies, and concluded that overall there was uncertainty about the impact of spirometry or a COPD diagnosis on smoking cessation rates.

Summary of evidence for Q2

This evidence map identified two systematic reviews with meta-analyses assessing the effect of spirometry feedback on smoking cessation. Both reported a non-significant trend for higher smoking cessation in the spirometry feedback groups (one only narrowly missing significance). In addition, one review reported a significant effect when restricting to studies of low risk-of-bias, while the other reported a significant effect when restricting to studies providing smoking cessation medicines or intensive counselling. A third systematic review did not include a meta-analysis but reported significant effects in two of seven individual studies.

Nine RCTs published since November 2017 assessed the effect of lung function feedback on smoking cessation rates, six using spirometry feedback and three using a range of pulmonary function assessments including spirometry. Of the nine RCTs, four reported significant effects on at least some analyses, two reported non-significant trends, and three reported no clear between-group differences. In addition, three single-arm studies assessed smoking outcomes following spirometry feedback, of which one reported a 14% smoking cessation rate, one

reported a 20% smoking cessation rate, and one reported greater smoking cessation rates in those with COPD or abnormal lung age than in those with normal spirometry results. It is possible that studies were not adequately powered for smoking outcomes (which could only be assessed within the subgroups of patients who were current smokers).

Conclusions for Q2

In summary, the two meta-analyses, based on RCTs published up to 2017, suggested a potential (though not definitive) effect of spirometry feedback on smoking cessation, while individual studies showed mixed results, possibly due to lack of statistical power. Further evidence synthesis work, including meta-analysis to address the lack of power in individual studies, may provide more conclusive evidence regarding the effect of lung function feedback on smoking cessation rates. However, data on smoking cessation on its own would be unlikely to lead to a change in the UK NSC's current position.

Conclusions

Summary of evidence for Q1: Effect of COPD screening on morbidity, mortality and HRQoL

This evidence map identified two systematic reviews for Q1; however, neither review identified any RCTs addressing the effect of COPD screening on health outcomes. This map also identified three RCTs of screening or case-finding for undiagnosed COPD followed by randomisation to enhanced care or usual care, with some analyses showing a significant benefit of enhanced care while the majority did not show a significant difference. In summary, this evidence map did not identify robust evidence on the benefits of COPD screening on health outcomes.

Summary of evidence for Q2: Effect of COPD screening on smoking cessation

This evidence map identified two meta-analyses assessing the effect of spirometry feedback on smoking cessation, based on RCTs published up to 2017. Both reported a non-significant trend for higher smoking cessation in the spirometry feedback groups, and a significant effect when restricting to studies of low risk-of-bias, or to studies providing smoking cessation medicines or intensive counselling. In summary, the available evidence suggested a potential, but not definitive, effect of spirometry feedback on smoking cessation.

Recommendations

Overall conclusions and recommendations

Regarding the effect of COPD screening on health outcomes, further evidence synthesis work is unlikely to lead to a conclusive answer to this question. Regarding the effect of COPD screening on smoking cessation, further evidence synthesis work, including meta-analysis to address the lack of power in individual studies, may provide more conclusive evidence regarding the effect of lung function feedback on smoking cessation rates. Further primary research on targeted COPD screening in current and former smokers may be valuable.

However, further synthesis work on smoking cessation on its own would be unlikely to lead to a change in the UK NSC's current position. On the basis of this evidence map, the volume and type of evidence related to screening for COPD is insufficient to justify a further evidence synthesis product at this stage, and so this topic should be re-considered in 3 years' time.

Appendix 1 — Search strategy for the evidence map

Databases and platforms searched

The following databases were searched: OVID MEDLINE, EMBASE via Ovid, Cochrane Database of Systematic Reviews and Cochrane Central Register of Controlled Trials.

Search dates

The searches were conducted on 15th July 2025.

Search strategies

Question 1 and Question 2 search strategy

The search strategy for Question 1 combined the following search concepts: ((COPD AND screening/case finding in title) OR (COPD AND tests AND screening)) AND Outcomes. The search for Question 2 combined the following search concepts: (Tests AND smoking cessation) OR (COPD AND screening/case finding in title AND smoking cessation). Results were limited to English language, human studies and the year 2017 onwards. The search strategies are presented below:

Ovid MEDLINE(R) Epub Ahead of Print and In-Process, In-Data-Review & Other Non-Indexed Citations and Daily <July 15, 2025>

Terms	Concept
1 *chronic obstructive lung disease/ or Pulmonary Disease, Chronic Obstructive/ 56092 2 (copd or chronic obstructive pulmonary disease).tw. 88835 3 ((airflow or airway) adj (obstruction or limitation)).tw. 28320 4 1 or 2 or 3 118113	COPD terms
5 *spirometry/ 5205 6 (spirometr* or bronchospirometr*).tw. 28799 7 *lung function test/ 11366 8 ((respiratory or lung or pulmonary) adj function test*).tw. 21199 9 (((respiratory or lung or pulmonary) adj5 (screen* or assess* or evaluat* or function)) and questionnaire?).tw. 10057 10 *Respiratory Function Tests/ 11366 11 (COPD Diagnostic Questionnaire or Lung Function Questionnaire or COPD Population Screener or "COPD Assessment in Primary Care to Identify Undiagnosed Respiratory Disease and Exacerbation Risk" or (CAPTURE and COPD and screening)).tw. 89 12 5 or 6 or 7 or 8 or 9 or 10 or 11 62727	Test terms

13 mass screening/ 122131 14 screen*.tw. 1124300 15 (case finding or case-finding).tw. 6352 16 13 or 14 or 15 1158947 17 (screen* or case-finding or case finding*).ti. 244003	Screening terms
18 4 and 17 881	COPD AND screening/case finding in title
19 4 and 12 and 16 1238	COPD AND tests AND screening
20 18 or 19 1765	(COPD AND screening/case finding in title) OR (COPD AND tests AND screening)
21 exp mortality/443170 22 *disease course/ or *adverse outcome/ or *chronicity/ or *disease exacerbation/ or *illness trajectory/ or exp *prognosis/ or exp *survival/ 69282 23 *"quality of life"/ 126896 24 (mortality or survival or morbidity).ti,ab. 2439194 25 ((copd or chronic obstructive pulmonary disease) adj5 (prognos* or progress* or sever* or exacerbat* or "quality of life" or qol)).ti,ab. 24239 26 (prognos* or progress* or sever* or exacerbat* or "quality of life" or qol).ti. 883570 27 *Hospitalization/ 50630 28 *Pneumonia/ 41216 29 acute respiratory illness*.ti,ab. 2179 30 (hospitali?ed or hospitali?ation*).ti,ab. 387143 31 (hospital and (visit* or admission* or admit*)).ti,ab. 338155 32 (exacerbat* and symptom*).ti,ab. 30100 33 or/21-32 3844809	Outcome terms
34 20 and 33 643	**Q1 results** ((COPD AND screening/case finding in title) OR (COPD AND tests AND screening)) AND Outcomes
35 Smoking Cessation/ 34596 36 ((smok* or "tobacco use") adj2 (cessation or quit* or stop or "give up")).ti,ab. 41985 37 35 or 36 54300	Smoking cessation terms
38 12 and 37 957	Tests AND smoking cessation

39 4 and 17 and 37 84	COPD AND screening/case finding in title AND smoking cessation
40 38 or 39 987	**Q2 results** (Tests AND smoking cessation) OR (COPD AND screening/case finding in title AND smoking cessation)
41 34 or 40 1548	Combined Q1 and Q2 results to avoid duplication
42 limit 41 to (english language and humans and yr="2017 - Current") 476	Limits applied
43 Letter/ 1302457 44 Editorial/ 731493 45 Comment/ 1053095 46 congress.pt. 68251 47 43 or 44 or 45 or 46 2405741	Publication types to exclude
48 42 not 47 **470**	**Combined Q1 and Q2 results** with limits applied (date, language, human studies, exclude non-relevant publication types)

Embase <1974 to 2025 Week 28>

Terms	**Concept**
1 *chronic obstructive lung disease/ 97704 2 (copd or chronic obstructive pulmonary disease).tw. 162758 3 ((airflow or airway) adj (obstruction or limitation)).tw. 42991 4 1 or 2 or 3 208019	COPD terms
5 *spirometry/ 6868 6 (spiromet* or bronchospiromet*).tw. 54496 7 *lung function test/ 8487 8 ((respiratory or lung or pulmonary) adj function test*).tw. 41343 9 (((respiratory or lung or pulmonary) adj5 (screen* or assess* or evaluat* or function)) and questionnaire?).tw. 19559 10 *lung function test/ 8487 11 (COPD Diagnostic Questionnaire or Lung Function Questionnaire or COPD Population Screener or "COPD Assessment	Test terms

in Primary Care to Identify Undiagnosed Respiratory Disease and Exacerbation Risk" or (CAPTURE and COPD and screening)).tw. 186 12 5 or 6 or 7 or 8 or 9 or 10 or 11 104008	
13 mass screening/ 65690 14 screen*.tw. 1615040 15 (case finding or case-finding).tw. 8108 16 13 or 14 or 15 1639324 17 (screen* or case-finding or case finding*).ti. 324496	Screening terms
18 4 and 17 1682	COPD AND screening/case finding in title
19 4 and 12 and 16 2818	COPD AND tests AND screening
20 18 or 19 3813	(COPD AND screening/case finding in title) OR (COPD AND tests AND screening)
21 exp mortality/1573123 22 *disease course/ 25533 23 *adverse outcome/ 11347 24 *chronicity/ 989 25 *disease exacerbation/ 28875 26 *illness trajectory/ 1399 27 *prognosis/ 78880 28 *survival/ 42609 29 *"quality of life"/ 170333 30 (mortality or survival or morbidity).ti,ab. 3663277 31 ((copd or chronic obstructive pulmonary disease) adj5 (prognos* or progress* or sever* or exacerbat* or "quality of life" or qol)).ti,ab. 46775 32 (prognos* or progress* or sever* or exacerbat* or "quality of life" or qol).ti. 1205545 33 *hospitalization/ 54121 34 *pneumonia/ 55983 35 acute respiratory illness*.ti,ab. 2891 36 (hospitali?ed or hospitali?ation*).ti,ab. 658023 37 (hospital and (visit* or admission* or admit*)).ti,ab. 620776 38 (exacerbat* and symptom*).ti,ab. 53645 39 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 5810450	Outcome terms
40 20 and 39 1672	**Q1 results** (COPD AND screening/case finding in title) OR (COPD AND tests AND screening) AND Outcomes

41 smoking cessation/ 78414 42 ((smok* or "tobacco use") adj2 (cessation or quit* or stop or "give up")).ti,ab. 58707 43 41 or 42 91558	Smoking cessation terms
44 12 and 43 2130	Tests AND smoking cessation
45 4 and 17 and 43 197	COPD AND screening/case finding in title AND smoking cessation
46 44 or 45 2231	**Q2 results** (Tests AND smoking cessation) OR (COPD AND screening/case finding in title AND smoking cessation)
47 40 or 46 3703	Combined Q1 and Q2 results to avoid duplication
48 letter.pt. 1366941 49 editorial.pt. 840930 50 48 or 49 2207871	Publication types to exclude
51 47 not 50 3637 52 limit 51 to (human and english language) 3345 53 limit 52 to yr="2017 -Current" 1768 54 limit 53 to embase 647 55 limit 53 to (embase or "preprints (unpublished, non-peer reviewed") **654**	**Combined Q1 and Q2 results** with limits applied (date, language, human studies, exclude non-relevant publication types)

Cochrane Library (CDSR and CENTRAL)

Terms	**Concept**
#1 MeSH descriptor: [Pulmonary Disease, Chronic Obstructive] explode all trees 8105 #2 (copd or chronic obstructive pulmonary disease) 25041 #3 ((airflow or airway) NEXT (obstruction or limitation)) 4471 #4 #1 or #2 or #3 28457	COPD terms
#5 MeSH descriptor: [Spirometry] this term only 2036 #6 (spiromet* or bronchospiromet*) 10312 #7 MeSH descriptor: [Respiratory Function Tests] this term only 4655 #8 ((respiratory or lung or pulmonary) NEXT function test*) 15433	Test terms

#9 (((respiratory or lung or pulmonary) NEAR/5 (screen* or assess* or evaluat* or function)) and questionnaire?) 6843 #10 (COPD Diagnostic Questionnaire or Lung Function Questionnaire or COPD Population Screener or "COPD Assessment in Primary Care to Identify Undiagnosed Respiratory Disease and Exacerbation Risk" or (CAPTURE and COPD and screening)) 4646 #11 #5 or #6 or #7 or #8 or #9 or #10 26501	
#12 MeSH descriptor: [Mass Screening] explode all trees 6077 #13 screen* 119663 #14 (case finding or case-finding) 5923 #15 #12 or #13 or #14 122542 #16 ((screen* or case-finding or case finding*)):ti 13762	Screening terms
#17 #4 and #16 153	COPD AND screening/case finding in title
#18 #4 and #11 and #15 1166	COPD AND tests AND screening
#19 MeSH descriptor: [Smoking Cessation] explode all trees 5868 #20 ((smok* or "tobacco use") adj2 (cessation or quit* or stop or "give up")) 232 #21 #19 or #20 6091	Smoking cessation terms
#22 #11 and #21 192	Tests AND smoking cessation
#23 #4 and #16 and #21 5	COPD AND screening/case finding in title AND smoking cessation
#24 #18 or #22 or #23 with Cochrane Library publication date Between Jan 2017 and Jul 2025 **856**	**Combined Q1 and Q2 results** with date limits applied

Numbers of results for each database and question if applicable

The number of results for each database and question were as follows:

- Q1 + Q2 Medline: 470
- Q1 + Q2 Embase: 654
- Q1 + Q2 Cochrane library (CDSR and CENTRAL): 856

Totals:

- Q1 and Q2: 1980

After exclusion of duplicates and trial registry records:

- Q1 and Q2: 1209.

Inclusions and exclusions

Inclusion criteria for the two questions are provided in Table 1.

Question	1. Effect of screening for COPD in previously undiagnosed adults on morbidity, mortality and health-related quality of life	2. Effect of screening for COPD in previously undiagnosed adults on smoking cessation rate

Population	• People with no previous COPD diagnosis (who do not recognise or report respiratory symptoms), in the following groups:
	  ○ All populations (for example, based on age)
	  ○ Targeted populations (for example, based on smoking history)
		• Same as for Q1

Setting	• UK (regional or national) • Western countries analogous to the UK (Europe, US, Canada, Australia, New Zealand)[a]	• Same as for Q1
Intervention (screening)	Screening using any combination of: • Risk assessment questionnaires • Lung (pulmonary) function tests, such as spirometry without bronchodilator • Combination of above tests Include: Studies of case-finding, where this is considered to be synonymous with screening.	• Screening or case-finding (tests as for Q1) • Impact of feedback to patients about results of spirometry or other lung function assessments on smoking cessation (whether or not in a screening setting)
Comparator	• No screening (standard care)	• Same as for Q1

Outcomes	• Mortality
	• Morbidity
	  ○ Physical health measures
	  ○ Frequency of COPD exacerbations
	  ○ Speed of progression of disease through the 4 GOLD clinical stages
	• HRQoL
	• Test uptake (secondary outcome, only to be obtained from studies included for Q1 or Q2)
	
	Exclude: Studies reporting only diagnostic and process outcomes (e.g. % referred, % diagnosed, % receiving treatments, feasibility, acceptability)
		• Smoking cessation rate
		• Test uptake (secondary outcome, only to be obtained from studies included for Q1 or Q2)

Study designs	• RCTs • Controlled experimental and quasi experimental studies • Controlled cohort and observational studies • Systematic reviews of the above	• RCTs • Experimental and quasi experimental studies (controlled or uncontrolled) • Cohort and observational studies (controlled or uncontrolled) • Systematic reviews of the above
Publication types	• Full publications only (exclude conference abstracts) • Publications with results only (exclude protocols and trial registries)	• Full publications only (exclude conference abstracts) • Publications with results only (exclude protocols and trial registries)

Question	1. Effect of screening for COPD in previously undiagnosed adults on morbidity, mortality and health-related quality of life	2. Effect of screening for COPD in previously undiagnosed adults on smoking cessation rate
Date limit	Since Nov 2017	Since Nov 2017
Language	English language	English language

[a]Includes: European Economic Area (EEA, i.e. 27 EU countries plus Iceland, Liechtenstein, Norway and Switzerland); United States, Canada, Australia, New Zealand.

COPD, chronic obstructive pulmonary disease; GOLD, Global Initiative for Chronic Obstructive Lung Disease; HRQoL, health-related quality of life; RCT, randomised controlled trial.

Appendix 2 – Abstract reporting

Question 1: Effect of screening for COPD on morbidity, mortality and health-related quality of life

The following tables summarise the abstracts of studies for Q1 (effect of screening for COPD on morbidity, mortality and health-related quality of life). Table 1 presents the characteristics and results of systematic reviews, while Table 2 and Table 3 present the characteristics and results of primary studies.

Table 1: Q1 Systematic review characteristics and results: Effect of COPD screening on health outcomes

Author, date	FT	Study type	Objectives / review question (relevant to Q1)	Country Search date	Study types included (for Q1)	Population (for Q1)	Screening test	Outcomes (for Q1)	N studies in SR and MA (for Q1)	Conclusions (relevant to map)
Choi 2022 (9)	Yes	SR+MA	To perform MA to update the USPSTF 2016 SR to evaluate the effect of screening for COPD via spirometry on health outcomes in asymptomatic adults	Various 2020	RCTs + SRs only	Asymptomatic adults Age >40y Any smoking status Prior COPD diagnosis excluded	Spirometry	Effect of screening for COPD on health outcomes	No RCTs or SRs identified	No direct evidence for the impact on health outcomes of screening asymptomatic adults for COPD was identified, similar to the previous SR. Further research is necessary to confirm the benefits of COPD screening.
Webber 2022 (USPSTF) (9)	Yes	SR+MA	To conduct a targeted SR to update the USPSTF 2016 SR on effect of screening or case-finding for COPD on health outcomes	Various 2015-2021	RCTs only	Asymptomatic adults Age NR Smoking status NR Prior COPD diagnosis excluded	Any test	Effect of screening or case-finding for COPD on health outcomes	No RCTs identified	The findings of this targeted evidence update are generally consistent with the findings of the previous systematic review supporting the 2016 USPSTF recommendation. The review included no trials on the effectiveness of screening. Evidence of pharmacologic treatment was still largely limited to persons with moderate airflow obstruction, and there was no consistent benefit observed for a range of non-pharmacologic interventions in mild to moderate COPD or in minimally symptomatic COPD.

Abbreviations: COPD, chronic obstructive pulmonary disease; FT, full text checked; MA, meta-analysis; N, number; NR, not reported; RCT, randomised controlled trial; SR, systematic review; USPSTF, US Preventive Services Task Force.

Table 2: Q1 Primary study characteristics: Effect of COPD screening on health outcomes

Author, date	FT	Title	Type Country Name	Design (overview)	Objectives	Population (age, smoking, diagnosis)	Total N participants	How participants identified	Screening test	Intervention	Comparator
Aaron 2024 (10)	Yes	Early Diagnosis and Treatment of COPD and Asthma - A Randomized, Controlled Trial	RCT Canada UCAP trial	New COPD or asthma cases identified via screening, then randomised to enhanced care vs. usual care	To identify symptomatic adults in the community [with] undiagnosed COPD or asthma [via] case-finding and to ... determine whether early diagnosis and treatment ... reduces health care utilisation for respiratory illness and improves health outcomes.	Age ≥18y Any smoking status Prior COPD diagnosis excluded	N=1,182,406 automated calls N=236,301 screened N=38,353 interviewed N=5,631 questionnaire N=2,857 spirometry N=508 randomised[b] N=258 randomised[a]	People with respiratory symptoms identified via random digit dialling	CDQ then spirometry (if met questionnaire threshold)	Pulmonologist-directed guideline-based care (N=253 all, N=130 COPD)	Usual primary care (N=255 all, N=128 COPD)
Martinez 2025 (11)	Yes	Impact of the CAPTURE Chronic Obstructive Pulmonary Disease Screening Tool in U.S. Primary Care: A Cluster-Randomized Trial	Cluster RCT USA CAPTURE study	Primary care practices randomised to use of CAPTURE tool to identify and manage COPD patients vs. usual care	To assess the impact of receiving screening scores for clinical and patient outcomes using the CAPTURE tool	Age 45-80y Any smoking status Prior COPD diagnosis excluded	100 primary care practices randomised Main analysis of N=387 CAPTURE-positive patients	Primary care practices identified new COPD patients either via CAPTURE tool or via usual methods	CAPTURE tool (5 symptom + exposure questions +/- peak expiratory flow rate) vs. usual method of identifying new COPD patients	Education for practice staff on COPD and CAPTURE tool plus patient-level CAPTURE scores (analysed N=226 CAPTURE-positive)	Education for practice staff on COPD only (analysed N=161 CAPTURE-positive)

Author, date	FT	Title	Type Country Name	Design (overview)	Objectives	Population (age, smoking, diagnosis)	Total N participants	How participants identified	Screening test	Intervention	Comparator
Petrie 2024 (12)	Yes	Case-Finding and Treatment Effects in COPD: Secondary Analysis of an Interdisciplinary Intervention Trial	Secondary analysis of cluster RCT Australia RADICALS trial	New COPD cases identified via case-finding, then randomised to enhanced care vs. usual care	To examine the distribution of demographic and clinical characteristics by time of COPD diagnosis and the effectiveness of early treatment versus usual care in those who were diagnosed via case-finding, and in those with or without symptoms.	Age ≥40y Current or former smokers Prior COPD diagnosis excluded	N=142 randomised N=108 current smokers N=98 analysed for SGRQ (subgroup with newly diagnosed COPD)	Case-finding within primary care practices participating in trial	Handheld COPD-6 screening device + RADICALS questionnaire. If meet threshold then spirometry + CAT + mMRC breathlessness questionnaire	Medicines review, pulmonary rehabilitation, smoking cessation support (N=57)	COPD education guide, referral to Quitline (N=41)

[a]COPD patients; [b]COPD + asthma patients.

Abbreviations: CAPTURE, COPD Assessment in Primary Care To Identify Undiagnosed Respiratory Disease and Exacerbation Risk tool/trial; CAT, COPD Assessment Test; CDQ, COPD Diagnostic Questionnaire; COPD, chronic obstructive pulmonary disease; FT, full text checked; mMRC, modified Medical Research Council; N, number; RADICALS, Review of Airway Dysfunction and Interdisciplinary Community-Based Care of Adult Long-Term Smokers trial; RCT, randomised controlled trial; SGRQ, St. George Respiratory Questionnaire; UCAP, Undiagnosed COPD and Asthma Population trial ; y, years.

Table 3: Q1 Primary study results: Effect of COPD screening on health outcomes

Author, date	FT	Screening test (S) Intervention (I) Comparator (C), N	Results: Mortality	Results: Morbidity (symptoms, lung function)	Results: Morbidity (hospitalisations, healthcare visits, respiratory illnesses)	Results: HRQoL	Results: Test uptake	Conclusions
Aaron 2024 (10)	Yes	**S:** CDQ then spirometry **I:** Pulmonologist-directed guideline-based care **C:** Usual care **N:** 258 randomised[a]	NR	[a]CAT score (at 12mo) lower than baseline by 2.6 points (I) and 2.2 points (C); difference: -0.4 points (95% CI: −1.9 to 1.1) [not significant; favours intervention] [a]FEV-1 (% predicted) increased by 5.5% (I) and 1.8% (C); difference: 3.6% (95% CI: 1.8% to 5.5%) [significant; favours intervention]	Healthcare visits for respiratory illness per person-year: [a]All healthcare visits: 0.46 (I) vs. 1.01 (C); IRR 0.46 (95% CI: 0.31 to 0.67) [significant] [b]Hospitalisations: 0.021 (I) vs. 0.030 (C); IRR 0.71 (95% CI: 0.17 to 2.99) [not significant] [b]ED visits: 0.069 (I) vs. 0.075 (C); IRR 0.92 (95% CI: 0.46 to 1.87) [not significant] [b]Primary care visits: 0.36 (I) vs. 0.91 (C); IRR 0.39 (95% CI: 0.29 to 0.53) [significant] [b]Specialist visits: 0.085 (I) vs. 0.096 (C); IRR 0.89 (95% CI: 0.45 to 1.76) [not significant]	[a]SGRQ score (at 12mo) lower than baseline by 7.1 points (I) and 4.8 points (C); difference -2.3 points (95% CI: −5.4 to 0.8) [not significant; trend favours intervention] [a]SF-36 (at 12mo) higher than baseline by 1.9 points (I) and 1.6 points (C); difference 0.3 points (95% CI: −2.7 to 3.3) [not significant; trend favours intervention]	[b]Test uptake: - 20% engaged with automated call - 78% of potentially eligible were later reached by telephone - 67% of those eligible had spirometry - 85% of those with COPD or asthma agreed to randomisation	In this trial, in which a strategy was used to identify adults in the community with undiagnosed asthma or COPD, those who received pulmonologist-directed treatment had less subsequent health care utilization for respiratory illness than those who received usual care.
Martinez 2025 (11)	Yes	**S:** CAPTURE tool vs. usual care **I:** Education on COPD and CAPTURE tool + CAPTURE scores **C:** Education on COPD only **N:** 387 analysed	NR	[c]CAT score: No significant difference in change to 12mo: -1.3 (I) vs. -0.9 (C); difference -0.32 (95% CI: -2.0 to 1.4, p=0.55) [trend favours intervention]	[c]Acute respiratory illness over 12mo: No significant difference: 24 (I) vs. 15 (C), difference 8.7 (-0.1 to 17.4, p=0.05) [c]Hospitalisations for respiratory illness over 12mo: No significant difference: 1.7 (I) vs. 1.3 (C), difference 0.4 (-2.0 to 2.7, p=0.76)	NR	NR	Within US primary care practices, COPD and CAPTURE education plus receipt of CAPTURE screening scores did not change clinician COPD assessment or care or patient outcomes for CAPTURE-positive patients. However, in the pre-pandemic period, CAPTURE-positive patients were more likely to undergo spirometry referral completion, whereas for CAPTURE-negative patients, clinicians were significantly less likely to assess for COPD, suggesting that the intervention resulted in a more appropriate use of healthcare resources.

Author, date	FT	Screening test (S) Intervention (I) Comparator (C), N	Results: Mortality	Results: Morbidity (symptoms, lung function)	Results: Morbidity (hospitalisations, healthcare visits, respiratory illnesses)	Results: HRQoL	Results: Test uptake	Conclusions
Petrie 2024 (12)	Yes	**S:** COPD-6 device, RADICALS, spirometry + CAT, mMRC questionnaire **I:** Medicines review, pulmonary rehabilitation, smoking cessation support **C:** COPD education guide, referral to Quitline **N:** 98 analysed	NR	CAT score (change to 12mo): no significant difference: -2.0 (I) and -3.8 (C); difference 1.1 (95% CI: -2.2 to 4.4) [trend favours comparator] mMRC breathlessness score (change to 12mo): no significant difference: -0.03 (I) and -0.10 (C); difference -0.03 (95% CI: -0.34 to 0.27) [trend favours comparator]	NR	SGRQ score (change to 12mo): no significant difference: -4.9 (I) and -4.2 (C); difference 2.4 (95% CI: -2.2 to 7.0) [trend favours intervention]	NR	Despite useful insights into the impacts of case-finding and early treatments, this study, like most others, was not sufficiently powered. Further larger studies or combining sub-groups across studies are required.

[a]COPD patients; [b]COPD + asthma patients; [c]CAPTURE-positive pts.

Abbreviations: C, comparator group; CAPTURE, COPD Assessment in Primary Care To Identify Undiagnosed Respiratory Disease and Exacerbation Risk tool/trial; CAT, COPD Assessment Test; CI, confidence interval; COPD, chronic obstructive pulmonary disease; ED, emergency department; FEV-1, forced expiratory volume in 1 second; FT, full text checked; HRQoL, health-related quality of life; I, intervention group; IRR, incidence rate ratio; mMRC, modified Medical Research Council; mo, months; N, number; NR, not reported; RADICALS, Review of Airway Dysfunction and Interdisciplinary Community-Based Care of Adult Long-Term Smokers trial; S, screening test; SF-36, 36-Item Short Form Health Survey; SGRQ, St. George Respiratory Questionnaire.

Question 2: Effect of screening for COPD on smoking cessation rate

The following tables summarise the abstracts of studies for Q2 (effect of screening for COPD on smoking cessation rate). Table 4 and Table 5 present the characteristics and results of systematic reviews, while Table 6 and Table 7 present the characteristics and results of primary studies.

Table 4: Q2 Systematic review characteristics: Effect of COPD screening on smoking cessation

Author, date	FT	Study type	Objectives / review question (for Q2)	Country Search date	Study types included (for Q2)	Population (for Q2)	N studies in SR and MA for Q2 (date range)	Total N	Screening test	Intervention	Comparator
Choi 2022 (9)	Yes	SR+MA	To perform a MA to update the USPSTF 2016 SR to evaluate the effect of screening for COPD via spirometry on smoking cessation rates in asymptomatic adults	Various 2020	RCTs + SRs only	Asymptomatic adults Current smokers Prior COPD diagnosis excluded	SR: 9 RCTs (published 1985-2017) MA: 7 RCTs	NR	Spirometry	Spirometry with feedback on results + smoking cessation intervention	Smoking cessation intervention (without spirometry or without feedback on results)
Clair 2019 (13)	Yes	SR+MA Cochrane	To determine the effect of providing smokers with feedback on e.g. spirometry results on smoking cessation rates	Various 2018	RCTs only	Age NR Current smokers Prior COPD diagnosis NR	SR+MA: 11 RCTs for relevant intervention (published 1985-2014)	N=3,314	Spirometry (9 RCTs) or carotid ultrasound[a] (2 RCTs)	Feedback on smoking-related harm (spirometry +/- lung age feedback or carotid ultrasound[a])	All intervention components other than biomedical test
Westerdahl 2019 (14)	Yes	SR	To determine whether providing spirometry results in combination with smoking cessation counselling can increase smoking cessation rates compared to counselling alone.	Various 2017	RCTs only	Age >18y Current smokers Prior COPD diagnosis NR	SR: 7 RCTs (published 1991-2014)	N=1,935	Spirometry	Spirometry results (lung age) plus smoking cessation counselling	Smoking cessation counselling alone

[a]Meta-analysis for spirometry (9 studies) also included carotid ultrasound (2 studies).

Abbreviations: COPD, chronic obstructive pulmonary disease; FT, full text checked; MA, meta-analysis; N, number; NR, not reported; RCT, randomised controlled trial; SR, systematic review; USPSTF, US Preventive Services Task Force; y, years.

Table 5: Q2 Systematic review results: Effect of COPD screening on smoking cessation

Author, date	FT	Screening test (S) Intervention (I) Comparator (C)	Results: Smoking cessation (abstinence)	Results: Smoking cessation (other)	Results: Test uptake	Conclusions
Choi 2022 (9)	Yes	**S:** Spirometry **I:** + Spirometry feedback + smoking cessation intervention **C:** Smoking cessation intervention	Smoking cessation (self-report or biochemically validated): - Meta-analysis (all 7 RCTs): RR 1.21 (95% CI: 0.87 to 1.67) [not significant] - Sustained abstinence (4 studies): RR 1.25 (95% CI: 0.80 to 1.94) [not significant] - Studies providing smoking cessation medicines or intensive counselling at public health centres or medical institutions (4 RCTs): RR 1.58 (95% CI: 1.14 to 2.19) [significant]	Quit attempts: - All 3 studies: RR 1.08 (95% CI: 0.90 to 1.29) [not significant]	NR	COPD screening effect on smoking cessation was present only when a smoking cessation program is provided through smoking cessation medicines or intensive counselling. Further research is necessary to confirm the benefits of COPD screening.
Clair 2019 (13)	Yes	**S:** Spirometry (9 RCTs) or carotid ultrasound[a] (2 RCTs) **I:** Feedback from spirometry or carotid ultrasound **C:** All components other than biomedical test	Smoking cessation (≥ 6mo): - Meta-analysis (N=11 RCTs): Trend for effect on smoking cessation but narrowly missed statistical significance: RR=1.26 (95% CI: 0.99 to 1.61) A sensitivity analysis removing those studies at high risk of bias did detect a benefit.	NR	NR	The most promising results relate to spirometry and carotid ultrasound, where moderate-certainty evidence, limited by imprecision and risk of bias, did not detect a statistically significant benefit, but confidence intervals very narrowly missed one, and the point estimate favoured the intervention. A sensitivity analysis removing those studies at high risk of bias did detect a benefit.
Westerdahl 2019 (14)	Yes	**S:** Spirometry **I:** Spirometry results + smoking cessation counselling **C:** Smoking cessation counselling	Smoking cessation: - No meta-analysis. Two RCTs showed significant improvement in smoking cessation with feedback on spirometry results (lung age) plus smoking cessation counselling vs. counselling alone. In the other five studies, no difference was found. Five further published protocols for ongoing RCTs in the field have been found.	NR	NR	Few studies have been undertaken to examine the efficacy of spirometry in increasing smoking quit rates. Studies conducted to date have shown mixed results, and there is currently limited evidence in the literature that smoking cessation counselling that includes feedback from spirometry and a demonstration of lung age promotes quit rates.

Abbreviations: C, comparator group; CI, confidence interval; COPD, chronic obstructive pulmonary disease; FT, full text checked; I, intervention group; mo, months; N, number; NR, not reported; RCT, randomised controlled trial; RR, relative risk; S, screening test.

[a]Meta-analysis for spirometry also included 2 studies of carotid ultrasound; this meta-analysis is included here since 9 of 11 studies used a relevant intervention.

Table 6: Q2 Primary study characteristics: Effect of COPD screening on smoking cessation

Author, date	FT	Title	Type Country Name	Design (overview)	Objectives	Population (age, smoking, prior COPD)	Total N	How participants identified	Screening test	Intervention	Comparator
RCTs											
Aaron 2024 (10)	Yes	Early Diagnosis and Treatment of COPD and Asthma - A Randomized, Controlled Trial	RCT Canada UCAP trial	New COPD or asthma cases identified via screening, then randomised	To identify symptomatic adults in the community [with] undiagnosed COPD or asthma [via] case-finding and to ... determine whether early diagnosis and treatment ... reduces health care utilisation for respiratory illness and improves health outcomes.	Age ≥18y Any smoking status Prior COPD excluded	N=1,182,406 automated calls N=236,301 screened N=38,353 interviewed N=5,631 questionnaire; N=2,857 spirometry N=508 randomised[b]; N=258 randomised[a]	People with respiratory symptoms identified via random digit dialling	CDQ then spirometry (if met questionnaire threshold)	Pulmonologist-directed guideline-based care (N=253 all, N=130 COPD). Current smokers received smoking cessation counselling and offered pharmacologic therapy	Usual primary care (N=255 all, N=128 COPD). Current smokers received smoking cessation counselling
Dahne 2022 (17)	Yes	Proactive Electronic Visits for Smoking Cessation and Chronic Obstructive Pulmonary Disease Screening in Primary Care: Randomized Controlled Trial of Feasibility, Acceptability, and Efficacy	RCT USA	New COPD cases identified via screening, then randomised	To evaluate an integrated asynchronous smoking cessation and COPD screening electronic visit that could be delivered proactively to adult smokers at risk for COPD, who are treated within primary care	Age >40y Current smokers Prior COPD excluded	N=125	People identified as part of COPD screening study in primary care	CAPTURE screening tool, if meet threshold then home spirometry and in-lab PFTs	Screening then two electronic visits for smoking cessation, plus smoking cessation medication if appropriate (N= 85)	Usual care (N=40)

Author, date	FT	Title	Type Country Name	Design (overview)	Objectives	Population (age, smoking, prior COPD)	Total N	How participants identified	Screening test	Intervention	Comparator
Jaen-Moreno 2021 (19)	Yes	Chronic obstructive pulmonary disease in severe mental illness: A timely diagnosis to advance the process of quitting smoking	RCT Spain	People with severe mental illness were randomised to experimental group or active control group.	To describe the prevalence of undetected COPD in a clinical sample of smokers with severe mental illness, and to assess the value of the TIMER tool, which informs smokers of their respiratory risk and uses brief text messages to reinforce intervention.	People with severe mental illness Age 40-70y Current smokers Prior COPD excluded	N=160	Consecutive outpatients who met criteria	Spirometry	Spirometry, lung age feedback and information on degree of airway obstruction, using TIMER tool, which informs smokers of their respiratory risk and uses brief text messages to reinforce intervention (N=82)	Active control using 5 A's intervention (N=78)
Martin-Lujan 2021 (20)	Yes	Effectiveness of a motivational intervention based on spirometry results to achieve smoking cessation in primary healthcare patients: randomised, parallel, controlled multicentre study	RCT ESPITAP Study Spain	Active smokers received brief smoking cessation advice along with spirometry assessment. Participants were randomised to intervention group or control group.	To compare the effectiveness of the usual smoking cessation advice recommended in the primary healthcare setting to a combination of that health advice and personalised information on spirometry results.	Age 35-70y Current smokers Prior COPD excluded	N=571	Patients attending primary healthcare centre for any medical reason who met the criteria	Spirometry	Brief counselling about smoking cessation (5A's strategy) and feedback on lung age and spirometry results (N=286)	Smoking cessation counselling and basic spirometry feedback (informed that results were within normal parameters) (N=285)

Author, date	FT	Title	Type Country Name	Design (overview)	Objectives	Population (age, smoking, prior COPD)	Total N	How participants identified	Screening test	Intervention	Comparator
Martin-Lujan 2023 (21)	Yes	Effectiveness of the spirometry-based motivational intervention to quit smoking: RESET randomised trial	RCT RESET Study Spain	Built on the ESPITAP study conducted in 2021. Active smokers were randomised to intervention group or control group. Both received smoking cessation counselling.	To assess the effectiveness of usual smoking cessation counselling compared with smoking cessation counselling plus information about the participant's spirometry results.	Age 35-70y Current smokers Prior COPD excluded	N=614	Patients attending primary healthcare centre for any medical reason who met criteria	Spirometry	Spirometry, and feedback on lung age and spirometry results, followed by counselling on (5A's) smoking cessation strategy (N= 308)	Brief smoking cessation counselling (N= 306)
Perisse 2024 (22)	Yes	Long-Term Consequences of Spirometry During Military Routine Medical Examinations on Smoking Cessation Compared to Minimal Advice	RCT France	French military smokers were identified and randomised into intervention group receiving spirometry and minimal advice or control group receiving minimal advice	To measure the consequences of spirometry associated with minimal advice, compared with only minimal advice in soldiers seen during a routine medical examination.	Age >18y Current smokers Prior COPD excluded	N=267	Participants (soldiers) presenting for occupational medicine visit.	Spirometry	Lung function test using a mini-spirometer. Patients received feedback on their results along with smoking cessation counselling and educational flyers about smoking cessation. (N=126)	Minimal smoking advice and educational flyers. (N=141)

Author, date	FT	Title	Type Country Name	Design (overview)	Objectives	Population (age, smoking, prior COPD)	Total N	How participants identified	Screening test	Intervention	Comparator
Petrie 2024 (12)	Yes	Case-Finding and Treatment Effects in COPD: Secondary Analysis of an Interdisciplinary Intervention Trial	Secondary analysis of cluster RCT RADICALS trial Australia	New COPD cases identified via case-finding, then randomised to enhanced care vs. usual care	To examine the distribution of demographic and clinical characteristics by time of COPD diagnosis and the effectiveness of early treatment versus usual care in those who were diagnosed via case-finding, and in those with or without symptoms.	Age ≥40y Current smokers Prior COPD excluded	N=142 randomised N=108 current smokers, N=98 analysed for SGRQ (subgroup with newly diagnosed COPD)	Case-finding within primary care practices participating in trial	Handheld COPD-6 screening device + RADICALS questionnaire. If meet threshold then spirometry + CAT + mMRC breathlessness questionnaire	Medicines review, pulmonary rehabilitation, smoking cessation support (N=57)	Usual care: COPD education guide, referral to Quitline (N=41)
Rodriguez-Alvarez 2022 (23)	Yes	Spirometry and Smoking Cessation in Primary Care: The ESPIROTAB STUDY, A Randomized Clinical Trial	RCT Spain	A 2 year RCT testing whether repeated, structured feedback of spirometry results during smoking cessation counselling increased quit rates compared with standard counselling alone in primary care smokers.	To evaluate the effectiveness of including information on spirometry results during smoking cessation counselling by the physician on quit rate in adult smokers.	Age ≥18y Current smokers Prior COPD excluded	N=350	Patients attending primary healthcare centre for any medical reasons	Spirometry	Brief structured advice on smoking cessation and information on spirometry results at baseline, and at 3mo and 6mo, along with a spirometry retest at 12mo (N=171)	At baseline, information on spirometry results and structured advice on smoking cessation. On consecutive follow-ups, smoking cessation advice only (N=179)

Author, date	FT	Title	Type Country Name	Design (overview)	Objectives	Population (age, smoking, prior COPD)	Total N	How participants identified	Screening test	Intervention	Comparator
Ronaldson 2018 (24)	Yes	The impact of lung function case-finding tests on smoking behaviour: A nested randomised trial within a case-finding cohort	Nested RCT within a case- finding cohort study UK	Nested RCT in COPD case finding, testing whether undergoing immediate lung function test influenced smoking cessation compared with a delayed-test control group.	To test the hypothesis that having case-finding tests for COPD changed self- reported smoking behaviour among general practice patients who were smokers compared with not having case- finding tests.	Age ≥35 years Current smokers [a]Prior COPD included: 12% had existing COPD diagnosis	N=674 randomised N=409 included in primary analysis	Database recruitment and opportunistic recruitment from general practitioner and nurses at face-to-face consultations.	Lung function assessment + clinical history + Wheezometer, + peak flow meter + microspirometry + relaxed vital capacity and forced vital capacity pre- bronchodilator spirometry + symptom questionnaire.	Lung health results and smoking cessation advice (N=340 randomised, N=194 analysed)	Usual care including smoking cessation advice (N=334 randomised, N=215 analysed)
Single-arm studies											
Bradley 2023 (15)	Yes	Diagnosis and treatment outcomes from prebronchodilator spirometry performed alongside lung cancer screening in a Lung Health Check programme	Single-arm prospective UK	Screening to identify people with unexplained symptomatic airflow obstruction who were referred to CRT for assessment and treatment.	To assess the downstream clinical assessment and management as a result of spirometry offered as part of a Lung Health Check in the Yorkshire Lung Screening Trial.	Age 55-80y Current or past smokers Previous COPD diagnosis in 21% of those meeting referral criteria	N=2,391 spirometry N=201 referred N=151 invited for further assessment N=97 attended N=70 post-bronchodilator spirometry N=59 new COPD diagnosis	People attending a Lung Health Check as part of a lung cancer screening trial	Spirometry (alongside low-dose CT screening)	Spirometry (N=70), smoking cessation consultation (N=59)	None

Author, date	FT	Title	Type Country Name	Design (overview)	Objectives	Population (age, smoking, prior COPD)	Total N	How participants identified	Screening test	Intervention	Comparator
Clergue-Duval 2020 (16)	No	COPD Positive Screening with Spirometry Increases Motivation to Quit Tobacco Smoking in an Addiction Treatment Centre	Single-arm retrospective France	Analysis of smoking status after 3mo of tobacco counselling.	To investigate the effects of abnormal spirometry results on motivational change and subsequent smoking cessation	Median 44y People attending an addiction outpatient centre Current smokers Prior COPD diagnosis NR	N=48	People attending an addiction outpatient centre	Spirometry	Feedback on spirometry results, 3mo of tobacco counselling (N=48)	None
Hourmant 2021 (18)	Yes	Screening for COPD in primary care, involving dentists, pharmacists, physiotherapists, nurses and general practitioners (the UNANIME pilot study)	Single-arm prospective UNANIME pilot study France	COPD screening in high-risk COPD population based on questionnaire, spirometry and smoking cessation counselling.	To assess the feasibility of implementing COPD screening in a high-risk COPD population, with the help of various healthcare professionals (general practitioners, pharmacists, dentists, physiotherapists, and nurses)	Age >40y Current smokers Prior COPD diagnosis excluded	N=157 screened N=35 had airflow obstruction	Opportunistic recruitment during encounter with range of healthcare professionals	Questionnaire, spirometry	Screening (N=157) then smoking cessation counselling (N=35)	None

[a]Ronaldson 2018 includes 12% with prior COPD; study included as majority of participants had no prior COPD diagnosis.

Abbreviations: CAPTURE, COPD Assessment in Primary Care To Identify Undiagnosed Respiratory Disease and Exacerbation Risk tool/trial; CAT, COPD Assessment Test; CDQ, COPD Diagnostic Questionnaire; COPD, chronic obstructive pulmonary disease; CRT, Community Respiratory team; CT, computed tomography; FT, full text checked; mMRC, modified Medical Research Council; mo, months; N, number; NR, not reported; PFT, pulmonary function test; RADICALS, Review of Airway Dysfunction and Interdisciplinary Community-Based Care of Adult Long-Term Smokers trial; RCT, randomised controlled trial; RESET, Results, Spirometry, Effectiveness and Tobacco study; SGRQ, St George's Respiratory Questionnaire; TAU, Treatment as usual; TIMER, Tobacco Intensive Motivational Estimated Risk tool; UCAP, Undiagnosed COPD and Asthma Population trial; y, years.

Table 7: Q2 Primary study results: Effect of COPD screening on smoking cessation

Author, date	FT	Screening test (S) Intervention (I) Comparator (C), N	Results: Smoking cessation (abstinence)	Results: Other smoking outcomes	Results: Test uptake	Conclusions
RCTs						
Aaron 2024 (10)	Yes	**S:** CDQ then spirometry **I:** Pulmonologist-directed guideline-based care **C:** Usual care **N:** 258 randomised	Smoking cessation at 12mo (current smokers): - Intervention arm: 9/64 (14%) - Comparator arm: 5/69 (7%)	NR	Test uptake (all pts): - 20% engaged with automated call - 78% of potentially eligible were later reached by telephone - 67% of those eligible had spirometry - 85% of those with COPD or asthma agreed to randomisation	No conclusion relating to smoking cessation.
Dahne 2022 (17)	Yes	**S:** CAPTURE screening tool spirometry and in-lab PFTs **I:** Screening, two electronic visits for smoking cessation, smoking cessation medication if appropriate (N:85) **C:** Usual care (N:40) **N:** 125	Smoking cessation (3mo, self-report): Favoured e-visit but not significant (OR=4.1) Smoking cessation (3mo, validated): Favoured e-visit but not significant (OR=2.1)	At 1mo, all cessation outcomes favoured the e-visit over usual care, with a significant effect for cessation medication use (OR=3.22) At 3mo, all cessation outcomes except for quit attempts favoured the e-visit, with significant effects for cessation medication use (OR=3.96) and smoking reduction (OR=3.09).	Of those eligible for spirometry, 49/64 (77%) completed home spirometry and 23/64 (36%) completed in-lab PFTs	A proactive, asynchronous e-visit for smoking cessation and COPD screening may offer a feasible, efficacious approach for broad interventions within primary care.
Jaen-Moreno 2021 (19)	Yes	**S:** Spirometry **I:** Spirometry, lung age feedback and information on degree of airway obstruction (N=82) **C:** Active control using 5 A's intervention (N=78) **N:** 160	Smoking cessation, validated (12mo): Favoured intervention but non-significant: 6/82 (7%) in intervention group vs. 3/78 (4%) in control group, p=0.64	Other outcomes (cigarettes per day, >50% reduction in tobacco use, quit attempts) improved from baseline in both groups, and most favoured intervention group, but no significant difference between groups	NR	In this pilot trial, one in four outpatients with a severe mental illness who smoked had undiagnosed COPD. An intensive intervention tool favours the early detection of COPD and maintains its efficacy to quit smoking, compared with the standard 5 A's intervention.

Author, date	FT	Screening test (S) Intervention (I) Comparator (C), N	Results: Smoking cessation (abstinence)	Results: Other smoking outcomes	Results: Test uptake	Conclusions
Martin-Lujan 2021 (20)	Yes	**S:** Spirometry **I:** Brief smoking cessation counselling and feedback on lung age and spirometry (N=286) **C:** Smoking cessation counselling and basic spirometry feedback (N=285) **N:** 571	Smoking cessation (12mo) = intervention group 16/286 (6%), vs control group = 6/285 (2%) p=0.03 (significant difference)	Point abstinence at 12mo: intervention group 57/286 (20%), vs control group 34/285 (12%), p=0.008 (significant difference) Attempted to quit smoking in intervention group is 169/286 (59%),vs in control group 145/285 (51%), p=0.042 (significant difference)	NR	In active smokers without known respiratory disease, brief advice plus detailed spirometry information doubled prolonged abstinence rates, compared with brief advice alone, in 12-month follow-up, suggesting a more effective intervention to achieve smoking cessation in primary healthcare.
Martin-Lujan 2023 (21)	Yes	**S:** Spirometry **I:** Feedback on lung age and spirometry results, smoking cessation counselling (N=308) **C:** Brief smoking cessation counselling (N=306) **N:** 614	Prolonged abstinence (12mo) was 24/308 (8%) in the intervention group, vs. 8/306 (3%) in control group (p = 0.004) (significant difference)	NR	NR	A primary care-delivered intervention involving brief counselling and detailed spirometry information proves effective in increasing abstinence rates among active smokers without known respiratory disease. Additionally, smoking cessation is also influenced by the individual's stage of change.
Perisse 2024 (22)	Yes	**S:** Spirometry **I:** Feedback on spirometry results, smoking cessation counselling and educational flyers about smoking cessation. (N=126) **C:** Minimal smoking advice and educational flyers. (N=141) **N:** 267	Smoking cessation (6mo) was 16/128 (18%) in intervention group and 19/141 (17%) in control group; not significant (p = 0.9) Smoking cessation (12mo) was 21/126 (27%) in intervention group and 20/141 (26%) in control group; not significant (p = 0.9)	At 6mo and 12mo, smoking behaviour and perception of the risk associated with smoking were not different in the intervention group compared with the control group.	NR	Spirometry does not seem to influence smoke cessation on a military population at 6 months. The overall cessation rate in our study was well in excess of the 3-6% expected from only providing minimal which is underused in general practice and should be encouraged.

Author, date	FT	Screening test (S) Intervention (I) Comparator (C), N	Results: Smoking cessation (abstinence)	Results: Other smoking outcomes	Results: Test uptake	Conclusions
Petrie 2024 (12)	Yes	**S:** COPD-6 device, RADICALS questionnaire, spirometry, CAT + mMRC questionnaires **I:** Medicines review, pulmonary rehabilitation, smoking cessation support (N=57) **C:** COPD education guide, referral to Quitline (N=41) **N:** 108 current smokers	Smoking cessation (12mo): no significant difference: N=2 (intervention) and N=3 (usual care); odds ratio 11.0 (95% CI: 0.4 to 324.2)	Other smoking outcomes showed no significant difference between groups at 12mo (heaviness of smoking index, readiness to quit index, smoking self-efficacy scale, visual analogue scale (VAS) for confidence and motivation to give up smoking)	NR	Despite useful insights into the impacts of case-finding and early treatments, this study, like most others, was not sufficiently powered. Further larger studies or combining sub-groups across studies are required
Rodriguez- Alvarez 2022 (23)	Yes	**S:** Spirometry **I:** Spirometry results and smoking cessation advice at baseline, and at 3mo and 6mo, and spirometry retest at 12mo (N=171) **C:** Spirometry results and smoking cessation advice at baseline. On follow-ups, smoking cessation advice only (N=179) **N:** 350	Smoking cessation at 12mo was 41/ 171 (24%) in intervention group vs. 29/179 (16%) in control group (p=0.060), and at 2yr was 25% in intervention group vs. 18% in control group (p=0.084) (not significant) An adjusted analysis to estimate the overall effect of the intervention regardless of the time of the visit suggested that the odds of smoking were 42% higher in the intervention than control group (p=0.018)	NR	NR	Regular and detailed feedback of spirometry results with smokers increases smoking cessation. Specifically, the likelihood of quitting smoking in the intervention group is 1.42 times higher than in the control group (p = 0.018).
Ronaldson 2018 (24)	Yes	**S:** Several tests including spirometry and questionnaires **I:** Lung health results and smoking cessation advice (N=340 randomised, N=194 analysed) **C:** Usual care including smoking cessation advice (N=334 randomised, N=215 analysed) **N:** 674 randomised, **N:** 409 included in primary analysis	Smoking cessation (self-report) at follow-up was 18/205 (8.8%) in test group and 21/229 (9.2%) in control group.	Smoking cessation by recruitment method (across both groups): 34/399 (9%) quit smoking in the recruitment group vs. 5/35 (14%) in opportunistic group	NR	There is no evidence from this trial of an effect of lung function tests on smoking cessation among a population of smokers aged 35 years or over. Indeed, when assuming that those with missing data were smokers, a slightly lower odds of smoking cessation was observed in the “test now” group compared with the “waiting list” group.

Author, date	FT	Screening test (S) Intervention (I) Comparator (C), N	Results: Smoking cessation (abstinence)	Results: Other smoking outcomes	Results: Test uptake	Conclusions
Single-arm studies						
Bradley 2023 (15)	Yes	**S:** Spirometry (alongside low-dose CT screening) **I:** Spirometry (N=70), smoking cessation consultation (N=59) **C:** None **N**: 114 smokers analysed	Smoking cessation (current smokers, timepoint NR): 23/114 (20%) reported successful quit, 17/114 (15%) biochemically validated	NR	Of current smokers, 79/114 (69%) attended smoking cessation consultation	Delivering spirometry alongside lung cancer screening may facilitate earlier diagnosis of COPD. However, this study highlights the importance of confirming airway obstruction by post-bronchodilator spirometry prior to diagnosing and treating patients with COPD and illustrates some downstream challenges in acting on spirometry collected during a Lung Health Check.
Clergue-Duval 2020 (16)	No	**S:** Spirometry **I:** Feedback on spirometry results, 3mo of tobacco counselling **C:** None **N:** 48	Smoking cessation (3mo): Greater in those found to have COPD (5/13, 38%) and with sub-threshold COPD i.e. abnormal lung age (6/10, 60%) than in those with normal spirometry (2/22, 9%)	Motivation to quit (Q-MAT score): Mean change was greater in those found to have COPD (4.6) than in the normal group (1.5)	NR	The effect of immediate spirometry results on motivation to quit varies according to the screened pulmonary damages and hazardous alcohol use. It could be a useful tool in addiction treatment centres.
Hourmant 2021 (18)	Yes	**S:** Questionnaire and spirometry **I:** Screening (N=157) then smoking cessation counselling (N=35) **C:** None **N:** 157 screened,35 had airflow obstruction	Smoking cessation, self-report (at 2mo): 22/157 (14%)	Engaged in a smoking cessation programme (at 2mo): 68/157 (43%)	NR	This pilot study suggested that a predefined screening of COPD by different healthcare professionals could be implemented in primary care and might be part of counselling for smoking cessation.

Abbreviations: 5As, Ask, Advice, Assess, Assist, Arrange; C, comparator group; CAPTURE, COPD Assessment in Primary Care to Identify Undiagnosed Respiratory Disease and Exacerbation Risk tool/trial; CAT, COPD Assessment Test; CDQ, COPD diagnostic questionnaire; CI, confidence interval; COPD, chronic obstructive pulmonary disease; FT, full text checked; I, intervention group; mMRC, modified Medical Research Council; mo, months; N, number; NR, not reported; OR, odds ratio; PFT, Pulmonary function test; Q-MAT,motivation to quit questionnaire; RADICALS, Review of Airway Dysfunction and Interdisciplinary Community-Based Care of Adult Long-Term Smokers; S, screening test; VAS, visual analogue scale.

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