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[Intervention Review]

Interventions for smoking cessation in people diagnosed with lung cancer

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ABSTRACT

Background

Lung cancer is one of the most common causes of death from cancer worldwide. Smoking induces and aggravates many health problems, including vascular diseases, respiratory illnesses and cancers. Tobacco smoking constitutes the most important risk factor for lung cancer. Most people with lung cancer are still active smokers at diagnosis or frequently relapse after smoking cessation. Quitting smoking is the most effective way for smokers to reduce the risk of premature death and disability. People with lung cancer may benefit from stopping smoking. Whether smoking cessation interventions are effective for people with lung cancer and whether one method of quitting is more effective than any other has not been systematically reviewed.

Objectives

To determine the effectiveness of smoking cessation programmes for people with lung cancer.

Search methods

We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (accessed via PubMed) and Embase up to 22 December 2018. We also searched the American Society of Clinical Oncology (ASCO) Annual Meeting proceedings, the lung cancer sections of the proceedings of the ESMO Congress, the lung cancer sections of the proceedings of the European Conference of Clinical Oncology (ECCO) Congress, the World Conference on Lung Cancer proceedings, the Society for Research on Nicotine and Tobacco Annual Meeting from 2013, the Food and Drug Administration website, the European Medicine Agency for drug registration website, the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) search portal, ClinicalTrials.gov, and the metaRegister of Controlled Trials (mRCT) to 30 December 2018. We applied no restriction on language of publication.

Selection criteria

We planned to include any randomised controlled trial (RCT) of any psychosocial or pharmacological smoking cessation intervention or combinations of both, compared with no intervention, a different psychosocial or pharmacological (or both) intervention or placebo for pharmacological interventions in people with lung cancer.

Data collection and analysis

Two review authors independently screened the studies from the initial search for potential trials for inclusion. We planned to use standard methodological procedures expected by Cochrane. We found no trials that met the inclusion criteria.

Main results

We identified no RCTs that met our inclusion criteria. Among the 1817 records retrieved using our search strategy, we retrieved 19 studies for further investigation. We excluded 15 trials: ten trials because we could not distinguish people with lung cancer from the other participants, or the participants were not people with lung cancer, four because they were not randomised, or RCTs. We excluded one trial because, though it was completed in 2004, no results are available. We assessed four ongoing trials for inclusion when data become available.

Authors' conclusions

There were no RCTs that determined the effectiveness of any type of smoking cessation programme for people with lung cancer. There was insufficient evidence to determine whether smoking cessation interventions are effective for people with lung cancer and whether one programme is more effective than any other. People with lung cancer should be encouraged to quit smoking and offered smoking cessation interventions. However, due to the lack of RCTs, the efficacy of smoking cessation interventions for people with lung cancer cannot be evaluated and concluded. This systematic review identified a need for RCTs to explore these.

PLAIN LANGUAGE SUMMARY

Smoking cessation interventions for people with lung cancer

Background

Lung cancer is the most common cause of death from cancer worldwide. Tobacco smoking constitutes the most important risk factor for lung cancer. Most people with lung cancer are still active smokers at diagnosis or frequently relapse (restart) after smoking cessation. Quitting smoking is the most effective way for smokers to reduce the risk of premature death and disability. Smoking cessation interventions can be divided into psychosocial interventions (methods that do not use medicines, such as advice and counselling) and pharmacological (medicines, such as nicotine patches) interventions. Behavioural (methods that change a person's behaviour) and pharmacological treatments are believed to have complementary methods of working, and to improve the chances of maintaining long-term abstinence independently. Quitting smoking after a diagnosis of lung cancer might be associated with decreased mortality (death), postoperative complications, recurrence and incidence of second primary lung cancer, and a greater treatment effectiveness and quality of life. Tobacco smoking cessation interventions play an important role in the management of people with cancer. Current and former smokers, especially people with lung cancer, should be encouraged to quit smoking. However, the effects of any type of smoking cessation programme for people with lung cancer are unclear.

Review question

We aimed to determine the effectiveness of any type of smoking cessation programme for people with lung cancer.

Key results

We searched medical databases to 22 December 2018 and other websites to 30 December 2018. We found no randomised controlled trials (clinical studies where people are randomly put into one of two or more treatment groups) for inclusion. We found four ongoing trials for inclusion when data become available. As of today, we are unable to conclude whether smoking cessation interventions are effective for people with lung cancer and whether one method is more effective than any other. People with lung cancer should be encouraged to quit smoking and offered help with smoking cessation, but we cannot recommend any type of smoking cessation intervention for people with lung cancer. High-quality randomised controlled trials are needed to answer this question.

Quality of evidence

No trials met our inclusion criteria, so there was no good-quality evidence.

BACKGROUND

Description of the condition

Lung cancer is one of the most common causes of death from cancer worldwide. There were 43,463 new cases of lung cancer diagnosed in the UK in 2011 ([Cancer Research UK](#)), and 1.82 million people diagnosed all over the world in 2012, accounting for 13% of all cancers ([GLOBOCAN 2012](#)). The World Health Organization (WHO) divides lung cancer into non-small-cell lung carcinoma (NSCLC) and small-cell lung carcinoma (SCLC). NSCLC accounts for more than 85% of all lung cancer cases and includes two major types: non-squamous carcinoma (including adenocarcinoma, large-cell carcinoma and other cell types) and squamous cell carcinoma ([Brambilla 2001](#)). Because obvious clinical manifestations, such as the haemoptysis, cough, dyspnoea, chest pain, hoarseness, weight loss and finger clubbing are unusual in the early stages of lung cancer, over three-quarters of people are only diagnosed when the disease has progressed ([National Cancer Institute](#)). This difficulty in diagnosing lung cancer at an early stage results in a higher death rate compared to other types of cancers where most people can be diagnosed early and treated curatively ([Ettinger 2013](#)). The five-year survival rate varies markedly depending on the stage at diagnosis, from 58% to 73% in stage I, from 36% to 46% in stage II, 24% in stage IIIA and from 9% to 13% in stage IIIB and IV ([Goldstraw 2007](#)).

Tobacco smoking, which contributes to approximately 85% to 90% of lung cancer cases, constitutes the most important risk factor for lung cancer ([Ettinger 2012](#)). Lung cancer risk increases with the number of packs of cigarettes smoked per day and with the number of years spent smoking (i.e. pack-years of smoking history) ([Ettinger 2013](#)). Compared with lifetime non-smokers, lifetime smokers have a mean 20-fold increase in the risk of developing lung cancer ([Alberg 2013](#)). More than 90% of people with lung cancer report positive smoking histories, among whom up to 64% people have been smoking for one year before diagnosis and 40% are still active smokers at diagnosis ([Eng 2014](#)). Up to 50% of people who smoke and have lung cancer do not stop smoking after their diagnosis or frequently relapse after smoking cessation ([Park 2012](#); [Walker 2006](#)).

Tobacco smoke is an aerosol containing more than 4000 substances, more than 50 of which are known to be carcinogenic, such as polonium 210, benzene, formaldehyde, lead and cadmium ([Andreas 2007](#)). Smoking induces and aggravates many health problems, including vascular diseases, respiratory illnesses and cancers ([Rigotti 2012](#)). There are, for understandable ethical reasons, no randomised controlled trials (RCTs) establishing the effectiveness of smoking cessation in people diagnosed with lung cancer. There are many studies, mostly retrospective, and thus based on incomplete reporting of smoking history ([Land 2012](#)), which suggest that quitting smoking after a diagnosis of lung cancer may be associated with significantly decreased mortality ([Parsons 2010](#); [Videtic 2003](#)), postoperative complications, recurrence and incidence of second primary lung cancer ([Andreas 2013](#); [Cataldo 2010](#)). In addition, there might be greater treatment effectiveness and quality of life (QoL) ([Balduyck 2011](#); [Baser 2006](#); [Chen 2012](#); [Garces 2004](#)). Tobacco smoking cessation interventions play an important role in the management of people with cancer ([Nayan 2013](#)). Current and former smokers, especially people with lung cancer, should be encouraged to quit smoking ([De Groot 2012](#); [Hurt 2011](#)). The guidelines of the European Society for Medical

Oncology (ESMO) recommends that people with all stages of NSCLC should be offered smoking cessation interventions, as this leads to superior treatment outcomes ([ESMO Guidelines Working Group 2014](#)). The guidelines of the American College of Chest Physicians (ACCP) includes a similar recommendation ([ACCP 2013](#)).

Description of the intervention

Smoking cessation interventions can be divided into psychosocial interventions and pharmacological interventions. Psychosocial interventions refer to intervention strategies that are designed to increase tobacco abstinence rates through psychological or social support mechanisms. These interventions include treatment strategies such as counselling, self help materials and behavioural support from individuals or groups. Behavioural treatment includes any psychotherapeutic approach aimed at identifying and modifying smoking-related behaviours ([Tobacco Use and Dependence Guideline Panel 2008](#)). Pharmacological therapies include all forms of nicotine replacement therapy (NRT), the nicotine receptor partial agonists (NRPA)s varenicline and cytisine, and the antidepressants, bupropion and nortriptyline. Counselling and pharmacotherapy may also be combined ([Cahill 2012](#); [Hughes 2014](#); [Rigotti 2012](#); [Vaidya 2014](#)). NRT, bupropion and varenicline are commonly prescribed. NRTs are available as non-prescription medications. They are authorised for use as first-line smoking cessation treatment, mainly used in the USA and in the European Union, and are widely recommended in many national guidelines ([Cahill 2013](#)). NRT is available as skin patches that deliver nicotine slowly, chewing gum, nasal and oral sprays, inhalers, lozenges and sublingual tablets. All forms of NRT can help people who try to quit smoking and increase their chances of successfully stopping smoking with a rate of quitting of 50% to 70% ([Stead 2012](#)). Bupropion was developed as a non-tricyclic antidepressant, and is sometimes the best choice for smokers who do not want to use a nicotine-based treatment, or who have already failed to quit using NRT ([Hughes 2014](#)). It has been licensed as a prescription aid to smoking cessation in many countries.

How the intervention might work

Quitting smoking is the most effective way for smokers to reduce the risk of premature death and disability. Behavioural and pharmacological treatments are believed to have complementary modes of action, and to improve the chances of maintaining long-term abstinence independently ([Stead 2012](#)). One systematic review and meta-analysis on smoking cessation interventions concluded that integrated pharmacological and behavioural counselling approaches were more effective than pharmacological approaches alone ([De Groot 2012](#)). There is evidence that standard, print-based self help, individually tailored self help materials, or more intensive advice or counselling increase the success of quit attempts ([Hartmann-Boyce 2014](#); [Lancaster 2005](#)). One systematic review found that advice, counselling, or both, given by nurses improved abstinence rates compared with no intervention ([Rice 2013](#)). Another systematic review showed that telephone counselling was more effective than providing self help materials or brief advice or pharmacotherapy alone ([Stead 2013a](#)). Advice from doctors to quit can increase the rate of quitting compared with no intervention ([Stead 2013b](#)). Group therapy doubles success compared with self help interventions and is more effective than other less-intensive interventions ([Stead 2005](#)).

The aim of NRT is to temporarily replace much of the nicotine from cigarettes, reduce motivation to smoke, and reduce the physiological and psychomotor withdrawal symptoms often experienced during an attempt to stop smoking, and therefore increase the likelihood of remaining abstinent (Stead 2012). In addition, when nicotine is provided by NRT, the user avoids about 4000 other toxins that are inhaled in tobacco smoke (Coleman 2012). Bupropion, which has both dopaminergic and adrenergic actions, seems to block nicotine effects and withdrawal symptoms by inhibiting the nicotinic acetylcholinergic receptor (Hughes 2014). Varenicline is a selective NRPA that plays the same role nicotine plays in the brain. It can decrease nicotine craving and nicotine withdrawal symptoms (Cahill 2013). Varenicline is more effective than placebo, doubling the rate of smoking cessation (Cahill 2013), and more effective than bupropion (Hughes 2014). Anxiety can contribute to increase smoking, and may be a symptom of nicotine withdrawal (Hughes 2007; Morissette 2007). Therefore, anxiolytics may help in smoking cessation by abating a withdrawal symptom or by replacing the reinforcing effects of nicotine (Hughes 2000).

Why it is important to do this review

Although people with lung cancer may benefit from stopping smoking, it is not clear whether smoking cessation interventions are effective for people with lung cancer and whether one programme is more effective than any other. We systematically reviewed the literature and planned to summarise the effectiveness of tobacco cessation interventions for people with lung cancer, reporting smoking cessation rates.

OBJECTIVES

To determine the effectiveness of smoking cessation programmes for people with lung cancer.

METHODS

Criteria for considering studies for this review

Types of studies

We planned to include RCTs only in this review.

Types of participants

We included people diagnosed with lung cancer at any stage and who were smokers at the time of intervention.

Types of interventions

We planned to include any RCT of any psychosocial or pharmacological smoking cessation intervention or combinations of both, compared with no intervention, a different psychosocial or pharmacological (or both) intervention, or placebo for pharmacological interventions, in people with lung cancer.

We planned to investigate the following comparisons:

- psychosocial intervention versus no intervention;
- any psychosocial intervention versus another psychosocial intervention;
- pharmacological interventions versus no intervention or placebo;

- any pharmacological intervention versus another pharmacological intervention;
- psychosocial plus pharmacological interventions versus no intervention;
- any combination of psychosocial plus pharmacological interventions with another combination.

Types of outcome measures

Primary outcomes

- Percentage of participants with continuous or prolonged abstinence over a period of six months or longer.

Secondary outcomes

- Percentage of participants with point prevalence abstinence over a period of six months or longer.
- Overall survival (OS).
- Progression-free survival (PFS).
- Quality of life (QoL).
- Any adverse events.

Search methods for identification of studies

Electronic searches

The search strategy was constructed in the following databases:

- the Cochrane Central Register of Controlled Trials (CENTRAL) (Issue 12, 2018) (Appendix 1);
- MEDLINE (from January 1950 to 22 December 2018), accessed via PubMed (Appendix 2);
- Embase (from January 1980 to 22 December 2018) (Appendix 3).

We applied no restriction on language of publication. We performed the search in collaboration with the Trials Search Co-ordinator of the Cochrane Lung Cancer Group.

We searched MEDLINE and Embase using both controlled vocabulary (namely, MeSH in MEDLINE and Emtree in Embase) and a wide range of free-text terms. We performed the search on MEDLINE using the Cochrane Highly Sensitive Search Strategy, sensitivity-maximising version (2008 version), as referenced in Chapter 6.4.11.1 and detailed in Box 6.4.c of the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011).

Searching other resources

We sought to identify abstracts of the following conferences on lung cancer and smoking cessation:

- lung cancer sections of the proceedings of the American Society of Clinical Oncology (ASCO) Annual Meeting, from 2013 onwards;
- lung cancer sections of the proceedings of the ESMO Congress, from 2013 onwards;
- lung cancer sections of the proceedings of the European Conference of Clinical Oncology (ECCO) Congress, from 2013 onwards;
- the World Conference on Lung Cancer, from 2013 onwards;
- the Society for Research on Nicotine and Tobacco Annual Meeting from 2013 (www.srnt.org/index.cfm).

We planned to include RCTs published only as abstracts and to contact study authors to request further information.

We checked reference lists of the included articles and any relevant reviews for any studies that the primary search of electronic resources did not identify.

We also searched:

- studies submitted to the Food and Drug Administration and to the European Medicine Agency for drug registration (www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm; (www.ema.europa.eu/ema/);
- the WHO International Clinical Trials Registry Platform (ICTRP) search portal (apps.who.int/clinicaltrials/; www.controlled-trials.com), ClinicalTrials.gov (clinicaltrials.gov/), and the metaRegister of Controlled Trials (mRCT) (www.isrctn.com/page/mrctcontrolledtrials.com/mrct/).

Data collection and analysis

Selection of studies

Two review authors (XY and TY) independently checked the abstracts of retrieved studies for relevance, and acquired full trial reports of potential candidates for inclusion. The review authors resolved any disagreements by mutual consent, or by recourse to a third review author (YH). We classified studies for which full reports were obtained but which did not meet the inclusion criteria as excluded. We recorded the selection process in sufficient detail to complete a Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) (Liberati 2009) flow diagram and a 'Characteristics of excluded studies' table, giving reasons for the decisions to exclude.

Data extraction and management

Two review authors (XY and TY) planned to extract study data independently into a data extraction form and to compare their findings. A third review author (YH) would have resolved any disagreement by discussion. Two review authors (XY and TY) planned to double-enter the data into Review Manager 5 (RevMan 2014). We planned to record the following information in a 'Characteristics of included studies' table:

- methods: study design, study name (if applicable), study recruitment period, country, number of study centres, study recruitment procedures;
- participants: number (intervention/control), definition of smoker used, specific demographic characteristics (e.g. age, gender, ethnicity, socio-economic status), cigarettes smoked per day, mean score on Fagerström Test for Nicotine Dependence (FTND), lung cancer stage, histology, any other relevant inclusion and exclusion criteria;
- intervention and control description: description of intervention(s) (treatment, dosage, regimen, behavioural support);
- outcomes: primary and secondary outcomes, including reported time points, definitions of abstinence, biochemical validation of abstinence;
- sources of funding and potential conflicts of interest of trial authors.

Assessment of risk of bias in included studies

Two review authors (XY and TY) planned to undertake assessment of the risk of bias for each study using the criteria outlined in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011). We planned to resolve any disagreements by discussion or by involving a third review author (YH).

We planned to rate each trial as being at high, low or unclear risk of bias for sequence generation, allocation concealment, blinding of participants and personnel, incomplete outcome data, selective outcome reporting and other potential sources of bias. This would have provided a direct quote or details from the study report, together with a justification for our judgement in the 'Risk of bias' table. We planned to address the domains of sequence generation, allocation concealment and selective outcome reporting in the tool by a single entry for each study. For blinding and incomplete outcome data, we intended to use two or more entries separately for different outcomes (or for the same outcome at different time points). We planned to note in the 'Risk of bias' table the proportion of participants for whom the outcome was imputed, and whether there was either high or differential loss to follow-up between the groups. We planned to assess 'other sources of bias' after single entry for studies as a whole. Where information on risk of bias related to unpublished data or correspondence with a trialist, we planned to note this in the table. We planned to summarise the risk of bias judgements across different studies for each of the domains listed, and planned to display the summary results in a 'Risk of bias' figure ('traffic lights' or bar chart, depending on the number of included studies) (Higgins 2011).

Measures of treatment effect

We planned to present the treatment effect of dichotomous outcomes (such as continuous or prolonged abstinence and point prevalence) as risk ratio (RR) and 95% confidence interval (CI). We planned to present the results for time-to-event outcomes (such as PFS and OS) as hazard ratio (HR) and 95% CI. For continuous data outcomes (such as QoL), we planned to present data as standardised mean difference (SMD) or mean difference (MD).

Unit of analysis issues

We planned to extract data on smoking outcomes from RCTs. In the case of cluster-randomised controlled trials, we would have attempted to extract, where available, a direct estimate of the required effect from an analysis that properly accounts for the cluster design. When such data would have been unavailable, we intended to perform an approximately correct analysis if the required information could be extracted (Higgins 2011).

In the case of trials with multiple intervention groups, we intended to combine all relevant experimental intervention groups of the study into a single group, and to combine all relevant control intervention groups into a single control group.

Dealing with missing data

We intended to attempt to contact investigators or study sponsors to verify key study characteristics and to obtain missing numerical outcome data when possible (e.g. when a study was identified as abstract only).

Furthermore, regarding smoking cessation, we planned to consider participants with missing outcome data as smokers.

Assessment of heterogeneity

We planned to evaluate levels of clinical heterogeneity (study characteristics, methods, outcomes) between included studies, to decide whether or not it would have been appropriate to pool study data.

We intended to use the I^2 statistic to assess the statistical heterogeneity among studies considering an I^2 value greater than 50% as substantial heterogeneity (Higgins 2011). In the case of heterogeneity among studies, we intended to explore clinical heterogeneity and methodological heterogeneity as potential causes, and it would have been noted and discussed. We also planned to explore heterogeneity in the subgroup analysis.

Assessment of reporting biases

We intended to address any suspected selective reporting of outcomes, as assessed by either of the review authors, by contacting the study authors for more information about the reported and unreported outcomes. When this would have not been not possible, and the missing data would have been thought to introduce serious bias, we would have explored the impact of including such studies in the overall assessment of results using a sensitivity analysis.

We planned to create and examine funnel plots if we included more than 10 trials in the review, to explore possible publication biases.

Data synthesis

We planned to use Review Manager 5 to summarise the data of interest and to produce forest plot graphics, using a random-effects model (RevMan 2014). If we had judged data aggregation unfeasible, we planned to discuss and present the results in the form of tables or graphics.

We intended to present three 'Summary of findings' tables, one for each major comparison (psychosocial versus no intervention, pharmacological versus no intervention or placebo, psychosocial plus pharmacological versus no intervention) according to the *Cochrane Handbook of Systematic Reviews of Intervention* (Higgins 2011). We planned to include data regarding the following outcomes: percentage of participants with prolonged or continuous (or both) abstinence, percentage of participants with point prevalence abstinence, PFS, OS, QoL and adverse events.

We planned to use the five GRADE considerations (study limitations, consistency of effect, imprecision, indirectness and publication bias) to assess the quality of a body of evidence as it was related to the studies that contribute data to the meta-analyses for the pre-specified outcomes. We planned to use methods and recommendations as described in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011), and as used

in GRADEpro software. We planned to justify all decisions to downgrade or upgrade the quality of studies by using footnotes and making comments to aid the reader's understanding of the review when necessary. We planned to provide a narrative summary of the included studies and, where appropriate, would have pooled these data in meta-analyses. For dichotomous data, we planned to use a random-effect Mantel-Haenszel model to estimate the pooled RR with 95% CI. For continuous data, we planned to use a random-effect inverse variance model to estimate the pooled SMD or MD with 95% CI. For time-to-event data, we planned to use a random-effect inverse variance model to estimate the pooled HR with 95% CI.

Subgroup analysis and investigation of heterogeneity

Whenever possible, we planned to perform the following subgroup analyses:

- cancer stage at diagnosis;
- curative versus non-curative treatment;
- demographic characteristics: age, gender, ethnicity, socio-economic status.

Sensitivity analysis

We planned to perform sensitivity analysis using smoking cessation outcomes, by limiting analysis only to trials with biochemical validation of smoking status.

RESULTS

Description of studies

See [Characteristics of excluded studies](#) table.

Results of the search

Searches returned 1817 references. We retrieved 1706 references after duplicates were removed. We discarded 1687 clearly irrelevant records at first-level screening by reviewing titles and abstracts. After second-level screening we were left with 19 articles for further assessment (Bastian 2011; Bastian 2013; Browning 2000; Clavero 2014; Schnoll 2003; Schnoll 2004a; Schnoll 2004b; Wewers 1997; Price 2017; Rettig 2018; Spangler 2015; Weaver 2015a; Weaver 2015b; NCT00032084; NCT01192256; NCT01434342; NCT01457469; NCT02048917; NCT02856581). Following assessment of the full text of these studies, we excluded 15 articles (Bastian 2011; Bastian 2013; Browning 2000; Clavero 2014; Schnoll 2003; Schnoll 2004a; Schnoll 2004b; Wewers 1997; NCT00032084; NCT01457469; Price 2017; Rettig 2018; Spangler 2015; Weaver 2015a; Weaver 2015b). We identified four ongoing study (NCT01192256; NCT01434342; NCT02048917; NCT02856581) (see [Characteristics of ongoing studies](#) table). No studies met our inclusion criteria. The study selection flow chart is shown in [Figure 1](#).

Figure 1. Study flow diagram.

Included studies

We included no studies in this review.

Excluded studies

We excluded 15 studies from the review for the following reasons ([Bastian 2011](#); [Bastian 2013](#); [Browning 2000](#); [Clavero 2014](#); [Schnoll 2003](#); [Schnoll 2004a](#); [Schnoll 2004b](#); [Wewers 1997](#); [NCT00032084](#); [NCT01457469](#); [Price 2017](#); [Rettig 2018](#); [Spangler 2015](#); [Weaver 2015a](#); [Weaver 2015b](#)) (see [Characteristics of excluded studies table](#)):

- in [Bastian 2011](#) and [Bastian 2013](#), we were unable to identify people with lung cancer;
- in [Schnoll 2003](#), [Schnoll 2004a](#), [Schnoll 2004b](#), [Price 2017](#), [Rettig 2018](#), [Spangler 2015](#), [Weaver 2015a](#) and [Weaver 2015b](#), we were unable to distinguish people with lung cancer from other participants;
- [Clavero 2014](#) and [Wewers 1997](#) had no control group, and were not randomised;
- [Browning 2000](#) was not an RCT;
- in [NCT01457469](#), it reports that it was "randomized" but it was also described as "Phase 1" (which is not an RCT). There was no clear description of the experimental intervention or the comparator on the website. Thus, it probably is not an RCT;
- [NCT00032084](#) was completed in 2004, but no results were available.

Risk of bias in included studies

The searches retrieved no trials relevant to this review and thus we conducted no assessment of methodological quality.

Effects of interventions

We included no studies in this review, so the effects could not be evaluated.

DISCUSSION

Although people with lung cancer may benefit from stopping smoking, we found no data from adequately powered RCTs to determine whether smoking cessation interventions are effective for people with lung cancer and whether one intervention is more effective than any other.

Summary of main results

No studies met the inclusion criteria for this review. Four ongoing RCTs included people with lung cancer participating in a smoking cessation programme ([NCT01192256](#); [NCT01434342](#); [NCT02048917](#); [NCT02856581](#)). These RCTs will be eligible for inclusion in future updates of this review.

Overall completeness and applicability of evidence

We found no high-quality RCTs fulfilling the study eligibility criteria.

Quality of the evidence

We found no RCTs for analysis.

Potential biases in the review process

The Trials Search Co-ordinator of the Cochrane Lung Cancer Group designed our search strategy. A strength of this systemic review is the comprehensive literature search, including several databases and clinical trials registers. We applied no language restrictions in our search strategy.

Agreements and disagreements with other studies or reviews

Our results identified no studies for analysis. Neither did we identify any high-quality observational studies that addressed this issue.

AUTHORS' CONCLUSIONS

Implications for practice

We found no randomised controlled trials (RCTs) that determined the effectiveness of any type of smoking cessation programme for people with lung cancer. There is insufficient evidence to determine

whether smoking cessation interventions are effective for people with lung cancer and whether one intervention is more effective than any other. People with lung cancer should be encouraged to quit smoking and offered smoking cessation interventions. However, due to the lack of RCTs, the efficacy of smoking cessation interventions for people with lung cancer cannot be evaluated and concluded. This systematic review identified a need for RCTs to explore these.

Implications for research

The efficacy of smoking cessation interventions for people with lung cancer can only be evaluated and concluded with high-quality RCTs, especially on the percentage of participants with prolonged or continuous (or both) abstinence and percentage of participants with point prevalence abstinence.

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Bastian 2013 {published data only}

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Browning 2000 {published data only}

Browning KK, Ahijevych KL, Ross P Jr, Wewers ME. Implementing the Agency for Health Care Policy and Research's Smoking Cessation Guideline in a lung cancer surgery clinic. *Oncology Nursing Forum* 2000;**27**(8):1248-54.

Clavero 2014 {published data only}

Clavero JM, Silva-Illanes N, Itriago LI, Gil R, Seijas D. Design, implementation and preliminary results of a tobacco cessation program in a private clinic [Abstract]. *Journal of Thoracic Oncology* 2014;**9** Suppl 3:S160-1.

NCT00032084 {published data only}

NCT00032084. S0002 - a program to quit smoking with or without bupropion in treating patients with stage I or II non-small cell lung cancer who have undergone surgery. clinicaltrials.gov/ct2/show/NCT00032084 (accessed 15 July 2015).

NCT01457469 {published data only}

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CHARACTERISTICS OF STUDIES

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Bastian 2011	RCT comparing telephone counselling plus tailored self directed materials with tailored self directed materials alone. The participants were not people with lung cancer
Bastian 2013	RCT comparing telephone counselling plus tailored self directed materials with tailored self directed materials alone. The participants were not people with lung cancer
Browning 2000	Not an RCT
Clavero 2014	No control group, not randomised
NCT00032084	Completed in 2004. No results were available. We were unable to get in touch with the authors to request the protocol or the results
NCT01457469	It reports the study as "randomized" but it is also described as "Phase 1" (which is not an RCT). There was no clear description of the experimental intervention or the comparator on the website. It probably was not an RCT. We were unable to get in touch with the authors to request the protocol and or any results
Price 2017	Unable to distinguish people with lung cancer from other participants
Rettig 2018	Unable to distinguish people with lung cancer from other participants
Schnoll 2003	Unable to distinguish people with lung cancer from other participants
Schnoll 2004a	Unable to distinguish people with lung cancer from other participants
Schnoll 2004b	Unable to distinguish people with lung cancer from other participants
Spangler 2015	Unable to distinguish people with lung cancer from other participants
Weaver 2015a	Unable to distinguish people with lung cancer from other participants
Weaver 2015b	Unable to distinguish people with lung cancer from other participants
Wewers 1997	No control group, not randomised

RCT: randomised controlled trial.

Characteristics of ongoing studies [ordered by study ID]

NCT01192256

Trial name or title	Studies Examining the Importance of Smoking After Being Diagnosed With Lung Cancer
Methods	Allocation: randomised Endpoint classification: efficacy study Intervention model: single group assignment Masking: open label Primary purpose: treatment
Participants	Inclusion criteria: <ul style="list-style-type: none"> clinical diagnosis of lung cancer Exclusion criteria: <ul style="list-style-type: none"> refusal of consent inability to provide exhaled carbon monoxide active psychiatric illness or substance misuse concurrent malignancies of another type other than non-melanoma skin cancer unable to travel for sessions with smoking cessation counsellor, outpatient visits from outset, or both WHO performance status 4 Life expectancy < 6 weeks
Interventions	Experimental: intensive quit smoking support Support by a hospital smoking cessation specialist and pharmacotherapy as per local stop-smoking and British Thoracic Society protocols Active comparator: physician advice to quit 5 minutes of advice, reading from a script based on the 5 'A's approach to smoking cessation and offered pharmacotherapy
Outcomes	Primary outcome: <ul style="list-style-type: none"> median and 2-year survival rates in confirmed smokers versus non-smokers newly diagnosed with lung cancer (time frame: 24 months) Secondary outcome: <ul style="list-style-type: none"> median survival and 2-year survival rates by smoking status for early (stage I/II NSCLC) versus those with advanced (stage III/IV) NSCLC (time frame: 24 months) number of treatment complications in smokers versus non-smokers (frequency surgical wound complications, radiotherapy-induced pneumonitis and median total radiation (Gy) dose; frequency and duration of neutropenic sepsis (time frame: 2 years) point prevalence of smoking at 0, 3, 6 12 and 24 months (time frame: 2 years) comparison of changes in health-related quality of life (EQ5D) in smokers versus non-smokers (time frame: 2 years) accrual and attendance rates of people with lung cancer attending a hospital smoking cessation service (time frame: 2 years) estimate of cost per quality-adjusted life year gained by smoking cessation advice in both quit strategies for smokers (time frame: 2 years)
Starting date	March 2010

NCT01192256 (Continued)

Contact information	Rachel E Roberts, BSc Telephone: +44 1554756567 ext 3569 Email: r.e.roberts@swansea.ac.uk
Notes	www.clinicaltrials.gov/ct2/show/NCT01192256

NCT01434342

Trial name or title	Feasibility of Delivering a Quitline Based Smoking Cessation Intervention in Cancer Patients
Methods	Allocation: randomised, Intervention model: parallel assignment Masking: open label
Participants	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> AJCC stages 0, I, II and III lung, breast, prostate, colorectal, bladder, head and neck, and cervical cancers (all histologies) reports smoking any amount in the last 7 days scheduled to receive or currently receiving surgery, radiation or chemotherapy OR have received ≥ 1 of the following in the last 6 months: surgery, last 4 radiation treatment or last chemotherapy treatment ≥ 18 years KPS of 70-100 ability to understand and the willingness to sign a written informed consent document willing to consider quitting smoking <p>Exclusion criteria:</p> <ul style="list-style-type: none"> unstable cardiac disease - defined as congestive heart failure, unstable angina, serious arrhythmias, or myocardial infarction in the past month current use or planned use of varenicline (Chantix), Zyban, bupropion or any other nicotinic receptor agonist (participants that discontinue use of these type drugs within 7 days are eligible) current probable alcohol abuse as defined by > 5 drinks per day for men and 4 drinks per day for women and an Alcohol Use Disorders Identification Test (AUDIT) score > 8. If participant answers "no" to 5 drinks per day for men and 4 drinks per day for women the participant is eligible. AUDIT assessment does not need to be administered. If participant answers "yes" to 5 drinks per day for men and 4 drinks per day for women the AUDIT assessment must be administered. If AUDIT score is > 8, participant is not eligible use of illegal drugs or use of prescription medications for non-medical reasons in the past month current use of chewing, dipping and pipe tobacco, or cigars participant does not have regular access to a telephone to receive Quitline calls lasting 15-30 minutes history of allergic reactions attributed to compounds of similar chemical or biological composition to NRT active peptic ulcer disease uncontrolled intercurrent illness including, but not limited to, ongoing, psychiatric illness/social situations that would limit compliance with study requirements due to unknown risks and potential harm to the unborn foetus, sexually active women of child-bearing potential must use a reliable method of birth control while participating in this study. Reliable methods of birth control are: abstinence (not having sex), oral contraceptives, intrauterine device, Depo-Provera, tubal ligation or vasectomy of the partner (with confirmed negative sperm counts) in a monogamous relationship (same partner). An acceptable, although less reliable, method involves the careful use of condoms and spermicidal foam or gel with or without

Interventions for smoking cessation in people diagnosed with lung cancer (Review)

NCT01434342 (Continued)

	<p>a cervical cap or sponge. They encouraged the participant to discuss this issue further with your doctors if you have any questions</p> <ul style="list-style-type: none"> if the participant was pregnant, should become pregnant or suspected to be pregnant prior to or while participating in this study, the participant should inform the study physician immediately. NRT has the potential for teratogenic or abortifacient effects and is classified as a FDA Pregnancy category D drug. The US 12 Clinical Practice Guideline states that pregnant smokers should be encouraged to quit without medication based on insufficient evidence of effectiveness and hypothetical concerns with safety. Pregnant women enrolled in the study and randomised to the Quitline group intervention should participate in the Quitline intervention but not receive the NRT because there was an unknown but potential risk for adverse events in nursing infants secondary to treatment of the mother with NRT, breastfeeding women were excluded from the study
Interventions	<p>Experimental: nicotine replacement patch</p> <p>Participants received a letter from their physician advising them to quit smoking, and undergo a 15- to 30-minute smoking-cessation counselling session by a trained research staff</p> <p>The participants were educated and motivated about the importance of quitting smoking, and cancer-specific quitting issues. They were called by Quitline in 2-3 days and received a fact sheet about benefits of smoking cessation for people with cancer</p> <p>Participants received 8 weeks of nicotine replacement patches and up to 5 proactive telephone calls over a 12-week period</p> <p>Participants also learn behavioural tips and coping skills</p> <p>Control group: no Intervention:</p> <p>Participants received a letter from their physician advising them to quit smoking, the importance of quitting smoking for people with cancer, and a copy of the National Cancer Institute's "Clearing the Air" smoking cessation booklet. Participants also received standard of care from their oncology and other treatment providers that may or may not include NRT</p>
Outcomes	<ul style="list-style-type: none"> Evaluate a smoking cessation intervention among people with cancer (time frame: 24 weeks) Evaluate a smoking cessation intervention among people with cancer who were scheduled to receive or currently receiving surgery, radiation or chemotherapy OR have received ≥ 1 of the following within the last 6 months surgery, last radiation treatment or last chemotherapy treatment in a community outpatient setting
Starting date	October 2011
Contact information	US, North Carolina W F Baptist Health Winston Salem, North Carolina, US, 27157
Notes	www.clinicaltrials.gov/ct2/show/NCT01434342

NCT02048917

Trial name or title	Smoking Cessation Strategies in Community Cancer Programs for Lung and Head and Neck Cancer Patients
Methods	<p>Allocation: randomised</p> <p>Endpoint classification: efficacy study</p> <p>Intervention model: parallel assignment</p> <p>Masking: open label</p> <p>Primary purpose: treatment</p>
Participants	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> participants must be ≥ 18 years of age

NCT02048917 (Continued)

- participant with newly diagnosed or recurrent, histological diagnosis of lung cancer or head and neck cancer (categories: oral cavity, pharynx and larynx only)
- having smoked at least 1 cigarette within 4 weeks of study enrolment
- having at least a 10-pack-year history of cigarette smoking
- having smoked at least 1 cigarette within 1 month of cancer diagnosis
- life expectancy > 1 year
- participant had an AUDIT score of < 10
- therapy planned was of curative intent
- participants must have the ability to understand and the willingness to provide signed written informed consent document

Exclusion criteria:

- known allergy attributed to bupropion, varenicline, transdermal or lozenge nicotine
- history of suicide attempt or preparation for attempt within the past 10 years
- C-SRSS Baseline/Screening: participant response of "Yes" to any question except question 1
- hospitalised for psychiatric illness within the past 2 years
- history of bipolar disorder
- currently taking bupropion for depression
- participant has taken monoamine oxidase inhibitors in the past 2 weeks
- history of eating disorder such as anorexia or bulimia
- active widespread skin disorders such as psoriasis, chronic urticarial or dermatitis
- history of epilepsy or seizure disorder
- active severe kidney or liver disease
- women must not be pregnant or lactating. Women of reproductive-potential must have negative serum or urine pregnancy test within 7 days prior to study enrolment and agree to use method of contraception during and for 30 days following last cessation drug dose
- participants within 3 months of a myocardial infarction
- participants with unstable angina or serious arrhythmia
- participants with psychiatric disability judged by the investigator to be clinically significant so as to preclude informed consent or compliance with drug intake
- participant taking varenicline or bupropion within 1 month of study enrolment
- participation in any other investigational drug study within 4 weeks of study enrolment
- currently enrolled in other professional tobacco cessation therapeutic intervention
- enrolment in a concurrent cancer therapeutic trial will require prior review and approval by the study site principal investigator to determine that there are no drug interactions concerns

Interventions	<ul style="list-style-type: none"> • High-intensity counselling + long-acting NRT + PRN NRT • High-intensity counselling + bupropion + PRN NRT • High-intensity counselling + varenicline + PRN NRT • High-intensity counselling + long-acting NRT • High-intensity counselling + bupropion • High-intensity counselling + varenicline • Low-intensity counselling + long-acting NRT + PRN NRT • Low-intensity counselling + bupropion + PRN NRT • Low-intensity counselling + varenicline + PRN NRT • Low-intensity counselling + long-acting NRT • Low-intensity counselling + bupropion • Low-intensity counselling + varenicline
Outcomes	<p>Cigarette use (time frame: 8 weeks)</p> <p>7-day point prevalence of cigarette use confirmed with carbon monoxide testing at 8 weeks</p>

NCT02048917 (Continued)

Starting date	July 2014
Contact information	Kris Damron Telephone: 859-323-1109 Email: kyclinicaltrialsnetwork@uky.edu
Notes	www.clinicaltrials.gov/ct2/show/NCT02048917

NCT02856581

Trial name or title	Management of Tobacco Treatment Intervention in Reducing Surgical Complications in Patients With Newly Diagnosed Lung Cancer Who Smoke Cigarettes
Methods	Allocation:Randomized Intervention Model:Parallel Assignment Masking:Double (Participant, Investigator) Primary Purpose:Supportive Care
Participants	<p>Criteria</p> <ul style="list-style-type: none"> • Ages Eligible for Study: 18 Years and older (Adult, Older Adult) • Eligible patients will have a new diagnosis of lung cancer and have sought a surgical consult relating to this diagnosis • Surgery must be scheduled no sooner than 10 days after randomization and no more than twelve weeks after randomization • Have smoked daily or nearly every day in the previous 6 months up to the date of surgical consult AND have smoked at least one puff in the previous 7 days • Motivated to stop smoking, as indicated by a score of 6 or above on the Contemplation Ladder • Within the 30 days before registration, no use of: 1) any pharmacologic treatment for smoking cessation, including bupropion or nicotine replacement therapy; 2) any nicotine delivery system (i.e., e-cigarettes and vape products); or 3) be enrolled in any formal behavioral treatment program for tobacco dependence as determined by patient report • No allergies to and not currently using varenicline • No suicidal thoughts as indicated by a positive (1+) response to the PHQ9 • No active untreated clinically significant psychiatric condition (psychosis, bipolar disorder, or depression) • Negative pregnancy test (serum or urine) done ≤ 7 days prior to registration, for women of child-bearing potential only <p>* A female of childbearing potential is a sexually mature female who: 1) has not undergone a hysterectomy or bilateral oophorectomy; or 2) has not been naturally postmenopausal for at least 12 consecutive months (i.e., has had menses at any time in the preceding 12 consecutive months)</p> <ul style="list-style-type: none"> • No unstable angina, myocardial infarction, or coronary angioplasty within the past 3 months or an untreated cardiac dysrhythmia • No history of seizures • No unstable neurologic, hepatic, renal, cardiovascular, lymphatic, or metabolic disease • Not currently on renal dialysis or has a history of significant renal impairment • No recent history (≤ 90 days) of substance abuse (outside of tobacco) defined by National Institute on Alcohol Abuse and Alcoholism (NIAAA) as: <ul style="list-style-type: none"> • If male, drinking > 14 alcoholic beverages per week for past 1 month • If female, drinking > 7 alcoholic beverages per week for past 1 month

NCT02856581 (Continued)

- Use of cocaine, heroin, club drugs (i.e., 3,4-methylenedioxymethamphetamine (MDMA)/"ecstasy"), methamphetamine, or hallucinogens (e.g., lysergic acid diethylamide [LSD]) at any time during the past 1 month
- Use of marijuana on a weekly basis for the past 1 month
- Patients must be able to complete study questionnaires in English
- No other household member or relative participating in the study
- No known history of any condition or factor judged by the investigator to preclude participation in the study or which might hinder study adherence
- Calculated creatinine clearance ≥ 30 mL/min * For females, use 85% of calculated creatinine clearance (CrCl) value

Interventions

Experimental: Intervention group (varenicline and behavioral intervention)
Patients receive varenicline PO QD on days 1-3 and BID on days 4-84 for 12 weeks in the absence of disease progression or unacceptable toxicity. Patients also complete behavioral intervention consisting of no smoking message from surgical team member and how to use NCI quitline at surgical consult.

Placebo Comparator: Control group (placebo and behavioral intervention)
Patients receive placebo PO QD on days 1-3 and BID on days 4-84 for 12 weeks in the absence of disease progression or unacceptable toxicity. Patients also complete behavioral intervention consisting of no smoking message from surgical team member and how to use NCI quitline at surgical consult.

Outcomes
Primary Outcome Measures :

- Mortality [Time Frame: Up to 30 days post-surgery]
- Re-hospitalization [Time Frame: Up to 30 days post-surgery]
- Incidence of pulmonary complications [Time Frame: Up to 24 weeks post-surgery]
- Incidence of intensive care unit readmission [Time Frame: Up to 24 weeks post-surgery]
- Incidence of unspecified wound infection [Time Frame: Up to 24 weeks post-surgery]
- Incidence of anastomotic failure [Time Frame: Up to 24 weeks post-surgery]

Secondary Outcome Measures :

- Change in QOL as measured by the LASA-12, PHQ-9, SEQ-12 [Time Frame: Baseline up to 24 weeks after surgery]
- Change in QOL as measured by Was It Worth It assessments [Time Frame: At 12 weeks after surgery]
- Change in QOL as measured by Was It Worth It assessments [Time Frame: At 24 weeks after surgery]
- Length of hospital stay [Time Frame: The time from surgery until the patient is released from the hospital]
- Length of high dependency unit stay [Time Frame: The time from surgery until the patient is released from the hospital]
- Expanded complication rate [Time Frame: Up to 1 year]
- Treatment adherence rates related to visits, medication compliance, quitline usage, and surgeon teachable moment delivery [Time Frame: Up to 12 weeks]
- Smoking abstinence rates as measured by self-report [Time Frame: Up to 12 weeks]
- Smoking abstinence rates as measured by salivary cotinine testing [Time Frame: Up to 12 weeks]

Starting date

September 29, 2017

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NCT02856581 (Continued)

Notes

<https://clinicaltrials.gov/ct2/show/NCT02856581>

AJCC: American Joint Committee on Cancer; C-SRSS: Columbia-Suicide Severity Rating Scale; FDA: Food and Drug Administration; KPS: Karnofsky Performance Status; NRT: nicotine replacement therapy; NSCLC: non-small-cell lung carcinoma; PRN: as needed; WHO: World Health Organization.

APPENDICES

Appendix 1. CENTRAL search strategy

#1 MeSH descriptor: [Lung Neoplasms] explode all trees

#2 lung neoplasm*

#3 lung cancer

#4 sclc

#5 nsclc

#6 (lung* or pulm*):ti,ab near/3 (tumor* or tumour* or cancer* or neoplas* or carcinoma* or adenocarcinoma* or squamous or oat cell or smal cell):ti,ab

#7 #1 or #2 or #3 or #4 or #5 or #6

#8 MeSH descriptor: [Tobacco Use Disorder] explode all trees

#9 Cigarette smok*

#10 continued cigarette*

#11 continued smoking

#12 current smok*

#13 smoking status

#14 still smok*

#15 tobacco dependen*

#16 tobacco addict*

#17 #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16

#18 #7 and #17

#19 MeSH descriptor: [Bupropion] explode all trees

#20 MeSH descriptor: [Tobacco Use Cessation Products] explode all trees

#21 bupropion

#22 vareniclin*

#23 MeSH descriptor: [Smoking Cessation] explode all trees

#24 MeSH descriptor: [Tobacco Use Cessation] explode all trees

#25 MeSH descriptor: [Tobacco Use Cessation Products] explode all trees

#26 smoking cessation

#27 smoking:ti,ab near/5 (quit* or stop* or ceas*):ti,ab

#28 #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27

#29 #18 and #28

Appendix 2. MEDLINE search strategy

1 Carcinoma, Non-Small-Cell Lung[Mesh]

2 Lung Neoplasms[Mesh]

3 Small Cell Lung Carcinoma[Mesh]

4 lung cancer[Title/Abstract]

5 lung tumor*[Title/Abstract]

6 lung tumour*[Title/Abstract]

7 non-small-cell lung*[Title/Abstract]

8 NSCLC[Title/Abstract]

9 SCLC[Title/Abstract]

10 small-cell lung cancer[Title/Abstract]

11 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10

12 (lung*[Title/Abstract] OR pulm*[Title/Abstract]) AND (tumor*[Title/Abstract] OR tumour*[Title/Abstract] OR squamous[Title/Abstract] OR oat cell*[Title/Abstract])

13 11 OR 12

14 Tobacco Use Disorder[Mesh]

15 Cigarette smok*[Title/Abstract]

16 continued cigarette*[Title/Abstract]

17 continued smoking[Title/Abstract]

18 current smok*[Title/Abstract]

19 smoking status[Title/Abstract]

20 still smok*[Title/Abstract]

21 tobacco dependen*[Title/Abstract]

22 tobacco addict*[Title/Abstract]

23 14 OR 15 OR 16 OR 17 OR 18 OR 19 OR 20 OR 21 OR 22

24 smok*[Title/Abstract] AND (post diagnos*[Title/Abstract] OR postdiag*[Title/Abstract] OR after diag*[Title/Abstract])

25 23 OR 24

26 13 AND 25

27 acupuncture[MeSH]

28 Anti-Anxiety Agents[MeSH]

29 Antidepressive Agents[MeSH]

30 Antidepressive Agents, Second-Generation[MeSH]

- 31 Azocines[MeSH]
- 32 Behavior Therapy[MeSH]
- 33 Benzazepines[MeSH]
- 34 Bupropion[MeSH]
- 35 Counseling[MeSH]
- 36 Directive Counseling[MeSH]
- 37 Exercise[Mesh]
- 38 Hypnosis[Mesh]
- 39 Nicotinic Agonists[MeSH]
- 40 Nicotinic Antagonists[MeSH]
- 41 Nortriptyline[MeSH]
- 42 Patient Education as Topic[MeSH]
- 43 Quinolizines[MeSH]
- 44 Quinoxalines[MeSH]
- 45 Smoking Cessation[MeSH]
- 46 Tobacco Use Cessation[MeSH]
- 47 Tobacco Use Cessation Products[MeSH]
- 48 abstinen*[Title/Abstract]
- 49 acupuncture[Title/Abstract]
- 50 antidepressant*[Title/Abstract]
- 51 anxiolyti*[Title/Abstract]
- 52 bupropion[Title/Abstract]
- 53 cessation aid*[Title/Abstract]
- 54 clonidine[Title/Abstract]
- 55 counseling[Title/Abstract]
- 56 cytisine[Title/Abstract]
- 57 dianicline[Title/Abstract]
- 58 doxepin*[Title/Abstract]
- 59 exercise[Title/Abstract]
- 60 fluoxetine*[Title/Abstract]
- 61 hypnosis[Title/Abstract]
- 62 imipramin*[Title/Abstract]
- 63 lazabemide*[Title/Abstract]
- 64 lobeline[Title/Abstract]
- 65 mecamylamine[Title/Abstract]

66 moclobemide[Title/Abstract]

67 nicobrevin*[Title/Abstract]

68 nicotine gum*[Title/Abstract]

69 nicotine inhaler*[Title/Abstract]

70 nicotine nasal spray*[Title/Abstract]

71 nicotine patch*[Title/Abstract]

72 nicotine therap*[Title/Abstract]

73 nicotine vaccin*[Title/Abstract]

74 Nortriptyline[Title/Abstract]

75 NRT[Title/Abstract]

76 nicotine replacement therap*[Title/Abstract]

77 paroxetin*[Title/Abstract]

78 patient education[Title/Abstract]

79 quit smoking[Title/Abstract]

80 quitting smok*[Title/Abstract]

81 rimonabant[Title/Abstract]

82 selegilin*[Title/Abstract]

83 sertralin*[Title/Abstract]

84 silver acetat*[Title/Abstract]

85 smoking cessation[Title/Abstract]

86 stop smoking[Title/Abstract]

87 stopping smoking[Title/Abstract]

88 tobacco cessation[Title/Abstract]

89 tobacco treatment[Title/Abstract]

90 tobacco use[Title/Abstract]

91 tryptophan*[Title/Abstract]

92 vareniclin*[Title/Abstract]

93 venlafaxin*[Title/Abstract]

94 zimeledin*[Title/Abstract]

95 27 OR 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR 35 OR 36 OR 37 OR 38 OR 39 OR 40 OR 41 OR 42 OR 43 OR 44 OR 45 OR 46 OR 47 OR 48 OR 49 OR 50 OR 51 OR 52 OR 53 OR 54 OR 55 OR 56 OR 57 OR 58 OR 59 OR 60 OR 61 OR 62 OR 63 OR 64 OR 65 OR 66 OR 67 OR 68 OR 69 OR 70 OR 71 OR 72 OR 73 OR 74 OR 75 OR 76 OR 77 OR 78 OR 79 OR 80 OR 81 OR 82 OR 83 OR 84 OR 85 OR 86 OR 87 OR 88 OR 89 OR 90 OR 91 OR 92 OR 93 OR 94

96 26 AND 95

97 (randomized controlled trial [pt] OR controlled clinical trial [pt] OR randomized [tiab] OR placebo [tiab] OR drug therapy [sh] OR randomly [tiab] OR trial [tiab] OR groups [tiab])

98 animals [mh] NOT humans [mh]

Interventions for smoking cessation in people diagnosed with lung cancer (Review)

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99 97 NOT 98

100 96 AND 99

Appendix 3. Embase search strategy

1 exp lung cancer/

2 exp lung tumor/

3 lung neoplasm*.mp.

4 lung cancer.mp.

5 SCLC.ti,ab.

6 NSCLC.ti,ab.

7 ((lung* or pulmon*) adj5 (tumor* or tumour* or cancer or neoplas* or carcinoma* or adenocarcinoma or squamous or oat cell or small cell)).ti,ab.

8 1 or 2 or 3 or 4 or 5 or 6 or 7

9 exp smoking cessation/

10 smoking cessation.ti,ab.

11 (smoking adj5 (quit* or stop* or ceas*)).ti,ab.

12 9 or 10 or 11

13 8 and 12

14 random:.tw. or clinical trial:.mp. or exp health care quality/

15 13 and 14

WHAT'S NEW

Date	Event	Description
12 May 2019	New search has been performed	New literature search run
12 May 2019	New citation required but conclusions have not changed	No new study found, the review remains empty. One ongoing study identified (NCT02856581). Five new studies excluded (Price 2017 ; Rettig 2018 ; Spangler 2015 ; Weaver 2015a ; Weaver 2015b). Conclusions remain unchanged.

CONTRIBUTIONS OF AUTHORS

LZ, XY, TY, JX and YH developed the background, objectives and methods section.

XY and YH reviewed the results of the search.

LZ drafted the results and discussion.

All review authors were involved in writing the review.

DECLARATIONS OF INTEREST

Linmiao Zeng: none known

Xiaolian Yu: none known

Tingting Yu: none known

Jianhong Xiao: none known

Yushan Huang: none known

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Internal sources

- Mindong Hospital Affiliated To Fujian Medical University, China.

External sources

- No sources of support supplied

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

None.

INDEX TERMS

Medical Subject Headings (MeSH)

*Lung Neoplasms; *Smoking Cessation; Negative Results; Smoking [adverse effects]

MeSH check words

Humans