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Evidence Check

Managing nicotine dependence in clinical settings

An Evidence Check rapid review brokered by the Sax Institute
for the NSW Ministry of Health—June 2023

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This report was prepared by: Guillaumier A & McCarter K, Trigg J, Hines S, Jackson M, Harrison N, Ishaque S, Rich J, Dowling A, Ela O, Bowden J, Dunlop A, Passey M, Baker A, Bonevski B.

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Effective clinical interventions for management of nicotine dependent patients in clinical settings

An Evidence Check rapid review brokered by the Sax Institute for the NSW Ministry of Health, June 2023.

This report was prepared by Guillaumier A & McCarter K, Trigg J, Hines S, Jackson M, Harrison N, Ishaque S, Rich J, Dowling A, Ela O, Bowden J, Dunlop A, Passey M, Baker A, Bonevski B.

Contents

Key messages

Question 1: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

- Since 2013 there has been no new evidence to update management of nicotine dependent patients during an inpatient stay. Provision of pharmacotherapy coupled with brief behavioural support remains best practice for acute inpatient healthcare settings
- To improve uptake of interventions during inpatient stay (and maintenance post discharge), designated healthcare staff should directly assist inpatients to obtain pharmacotherapy during admission and directly connect them to ongoing behavioural support (i.e. quitline)
- Varenicline should be offered to all nicotine dependent patients who do not have contraindications for its use, combined with behavioural support, with both varenicline and behavioural support being continued (after discharge for inpatients) for a full treatment course (e.g. 12 weeks, or longer if required). For those for whom varenicline is contraindicated, combination nicotine replacement therapy (cNRT) with counselling support should be offered.
- In the absence of research assessing strategies to support cessation from e-cigarettes, general nicotine dependence treatment guidelines should be followed.

Question 2: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients from special interest population groups to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

- This Evidence Check found insufficient evidence to provide recommendations about the following special interest population groups: Aboriginal and Torres Strait Islander people, e-cigarette users who do not use other tobacco products and dual users of e-cigarettes and tobacco products
- Counselling interventions are effective in supporting smoking cessation in late pregnancy for pregnant women
- Multi-component interventions combining pharmacotherapy (varenicline and/or NRT) with multiple behavioural supports (e.g. brief advice, quitline) are effective in supporting short-term cessation among mental health service consumers and patients who use alcohol and other drugs (AOD)
- Among special interest population groups, brief interventions are unlikely to produce long-term cessation.

Question 3: What have been the barriers and enablers to implementation of brief clinical interventions in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

- An alternative search strategy is recommended to adequately evaluate the enablers and barriers to implementation of brief clinical interventions in healthcare settings to manage nicotine dependence and support smoking cessation (particularly among priority groups)
- From limited data, enablers include a smoke-free setting, accessible referral and prescription pathways, subsidised care, and involvement of a variety of healthcare staff. Barriers reported include logistical challenges as patients move through the system, and cost in terms of both budget and healthcare staff time.

Executive summary

Background

The NSW Ministry of Health has asked for a review of the latest evidence to inform the development of an updated Managing Nicotine Dependence: A Guide for NSW Health Staff. There has been a long-term reduction in tobacco smoking over the past 30 years with smoking now largely concentrated in population subgroups. New developments have emerged such as the increased availability of e-cigarettes containing nicotine. The purpose of this Evidence Check is to identify the most effective clinical interventions for nicotine dependent patients in clinical settings.

Evidence Check questions

This review aimed to address the following questions:

Question 1: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

Question 2: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients from special interest population groups to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

Question 3: What have been the barriers and enablers to implementation of brief clinical interventions in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

The **special interest population groups** this Evidence Check focuses on are: Aboriginal and Torres Strait Islander people, pregnant women, mental health service consumers, patients who use alcohol and/or other drugs (AOD), dual users of e-cigarettes and tobacco products, and e-cigarette users who do not use other tobacco products.

Summary of methods

An extensive search of peer-reviewed and grey literature published between January 2013 and April 2023 identified 74 eligible studies for inclusion in the Evidence Check. We used the National Health and Medical Research Council (NHMRC) Levels of Evidence to assess the robustness of the included studies.

Key findings

Question 1: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation.

A summary of systematic reviews (primarily Cochrane reviews) is presented as a contextual state-of-the-evidence on smoking cessation interventions. Findings from the n=47 identified primary studies are then reported for each question. **No studies targeting cessation of e-cigarettes were identified.**

Systematic reviews: Of the 27 systematic reviews included in this Evidence Check rapid review, 25 were Cochrane reviews (NB: reviews are not restricted to reporting studies from healthcare settings only). Considered together, this evidence shows that adding behavioural support (in person or via telephone) to pharmacotherapy increases quit rates. Varenicline is the most effective licensed pharmacotherapy to achieve cessation and assist in relapse prevention, followed by combination NRT. Behavioural support for smoking cessation can increase long-term quit rates, and although individual counselling is more effective than minimal contact, brief advice, text-messaging and self-help materials all produce at least a small positive effect on cessation rates.

Q1a) We identified no studies that assessed the pre-specified outcomes of interest (abstinence during inpatient stay, withdrawal symptoms during inpatient stay, violation of smoke-free policies or self-directed discharge) for managing nicotine dependence during inpatient stay as either primary or secondary outcomes of effectiveness. Interventions combining pharmacotherapy and brief behavioural support to manage nicotine dependence during admission remain best practice for acute inpatient care settings (as evidenced by 12/17 studies conducted in an inpatient setting providing this combination as usual care / control condition). Six studies trialled interventions to optimise this usual care during inpatient stay, finding that direct or assisted provision of pharmacotherapy and/or connection to quitline by dedicated healthcare staff (e.g. nurse, pharmacist) increases the use of these interventions both during inpatient stay and post discharge.

Q1b) Overall, 93% of studies trialled interventions combining pharmacotherapy with behavioural support. We identified 11 studies conducted in inpatient settings, three studies conducted in a mix of inpatient and outpatient settings, and 27 studies conducted in outpatient and/or community settings that focused on supporting cessation from tobacco cigarettes.

Evidence from studies conducted in inpatient settings that focused on supporting cessation post discharge found: 1) varenicline initiated during inpatient stay and combined with multi-session

counselling (via staff or quitline) significantly increases long-term quit rates and 2) multi-component interventions combining brief advice, NRT and some form of ongoing behavioural support (e.g. quitline or other multi-session counselling) significantly increases abstinence rates post discharge.

Evidence from studies conducted in outpatient and community-based healthcare settings demonstrates that multi-component interventions combining pharmacotherapy (varenicline, cNRT) with multi-session behavioural support increase abstinence rates among nicotine dependent patients. Varenicline and cNRT are the pharmacotherapies consistently found to be effective for tobacco cessation. However, there is a lack of evidence assessing strategies to support long-term e-cigarette cessation. Brief cessation counselling can feasibly and effectively be delivered by a range of practitioners across healthcare settings; however, multi-session counselling (e.g. via quitline) provides better cessation outcomes.

Question 2: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients from special interest population groups to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

We did not identify any studies that met the Evidence Check inclusion criteria for the following special interest population groups: i) **Aboriginal and Torres Strait Islander people**; ii) **e-cigarette users who do not use other tobacco products**, and iii) **dual users of e-cigarettes and tobacco products**.

For **pregnant women**, there is high-certainty evidence from a Cochrane review that counselling interventions offered on their own and not as part of a larger intervention were effective in supporting smoking cessation in late pregnancy. Two primary studies assessed either NRT or bupropion as a cessation tool, with each intervention supporting periods of abstinence during pregnancy, although none produced significant effectiveness related to cessation at the end of pregnancy.

For **mental health service consumers**, varenicline is effective at promoting long-term abstinence with no evidence to suggest an increase in neuropsychiatric adverse events in this group. Inpatient multi-component interventions that combine pharmacotherapy and multiple behavioural supports and extend into the post-discharge period may also be effective at promoting long-term abstinence.

For **patients who use alcohol and other drugs (AOD)** provision of pharmacotherapy (varenicline, NRT, or varenicline and NRT combined) plus brief advice results in increased abstinence at end of treatment; however, cessation is not sustained long term.

Question 3: What have been the barriers and enablers to implementation of brief clinical interventions in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

From limited data, enablers include a smoke-free setting, accessible referral and prescription pathways, subsidised care, and involvement of variety of healthcare staff roles. Barriers reported include logistical challenges as patients move through the system, and cost in terms of both budget and healthcare staff time.

Gaps in the evidence

Noteworthy gaps in the evidence included: 1) No studies conducted in inpatient settings addressed outcomes related to: not smoking on healthcare setting grounds, tobacco abstinence *during* stay, self-directed discharge. 2) No primary studies included in the Evidence Check addressed nicotine dependence management and tobacco cessation in healthcare settings for youth aged 12–18 years. 3) None of the studies we captured explicitly addressed e-cigarette nicotine dependence or e-cigarette cessation. 4) We did not identify any Level I evidence or Level II effectiveness trials of smoking and/or e-cigarette cessation interventions for Aboriginal and Torres Strait Islander people.

Implications

Since the development of the 2015 guidelines, the recommendation for a multi-component approach of both pharmacotherapy and behavioural interventions as best practice for smoking cessation remains unchanged by the evidence. Consistent with the previous guidelines, varenicline remains the most effective monotherapy. Findings from this Evidence Check suggest a range of healthcare providers should be used to deliver smoking cessation care interventions. During inpatients stays direct and assisted connection to quitline should be delivered as part of behavioural interventions, and direct provision of pharmacotherapy should be part of a specified healthcare provider role to ensure delivery and uptake. To support smoking cessation for nicotine dependent patients varenicline combined with multi-session behavioural support over the treatment course is recommended. Where patients have contraindications, cNRT plus multi-session behavioural support should be provided. Currently there is a lack of evidence assessing cessation strategies specific to e-cigarette use. As such, we recommend following established nicotine dependence treatment protocols for e-cigarette cessation.

Background

Tobacco smoking is one of the leading preventable causes of death worldwide and a major risk factor for cardiovascular disease, cancer and respiratory diseases. Addiction to tobacco smoking is driven by nicotine, a stimulant found in cigarettes and other tobacco products. Nicotine self-administration is driven by positive (e.g. improves vigilance, cognition, mood modulation, alleviates boredom and decreases appetite) and negative reinforcing effects (alleviation of withdrawal in the context of physical dependence). Tobacco smoking is also habitual and has social dimensions that add complexity to quitting. Quitting tobacco smoking can be a complex process, often requiring multiple attempts and/or longer interventions to achieve long-term success. However, behavioural and pharmacological interventions can assist individuals to cease using tobacco products.

There has been a long-term reduction in adult daily tobacco smoking over the past 30 years, from 28% in 1989–90[1] to 10.7% in 2020–21.[2] However, tobacco smoking rates in priority populations remain relatively high. For example, up to 70% of those with serious mental illness smoke tobacco[3] and rates are as high as 87% in AOD treatment services.[4] Interventions that are effective for the general population are not necessarily translatable to priority populations. Often intensive interventions are required and quit rates are modest.

Since the last version of NSW Health's Managing Nicotine Dependence: A Guide for NSW Health Staff guidelines, e-cigarettes have emerged as an alternative nicotine delivery system and while there is literature addressing their use as a tobacco cessation tool, e-cigarette use still results in ongoing long-term nicotine use. The purpose of this Evidence Check is to inform a guide to manage nicotine dependence in NSW Health settings (including e-cigarette-related nicotine dependence). The current policy of NSW Health does not permit e-cigarettes in healthcare settings to manage nicotine dependence. Aligned with RACGP smoking cessation guidelines[5], NSW Health's current policy does not support e-cigarettes as a smoking cessation intervention. Therefore, we did not include evidence for the use of e-cigarettes as a smoking cessation intervention in the Evidence Check.

Various interventions, supports and resources are available to assist individuals in quitting smoking. This report reviews the evidence-based strategies and interventions available to support people in clinical settings (inpatient and outpatient) to manage nicotine dependence. The purpose of this Evidence Check is to identify the most effective interventions within clinical settings for managing nicotine dependence and encouraging cessation of tobacco smoking and e-cigarette use.

This Evidence Check answers three questions:

- Question 1: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?
- Question 2: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients from special interest population groups to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

- Question 3: What have been the barriers and enablers to implementation of brief clinical interventions in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

Findings from this Evidence Check will contribute to updating the 2015 Managing Nicotine Dependence: A Guide for NSW Health Staff guidelines.

Methods

Aims and scope of the Evidence Check

We completed a structured rapid review of peer-reviewed literature to identify the most relevant evidence to address the three research questions. We undertook one search to answer all three questions. The search strategy described below was developed to answer Question 1. Questions 2 and 3 were answered using the literature identified to answer Question 1.

- **Question 1**: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?
  - See Appendix 1—Question 1 for young people aged 12–18 years who are dependent on tobacco-combustible products.
- **Question 2**: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients from special interest population groups to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?
  - Studies identified in Question 1 that were conducted with any of the special interest population groups were flagged to answer Question 2.
- **Question 3:** What have been the barriers and enablers to implementation of brief clinical interventions in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?
  - Barriers and enablers were extracted from findings reported or author insights from papers identified to answer Question 1. The Evidence Check search strategy did not seek out studies primarily focused on these outcomes.

The process used to identify, screen, assess and synthesise relevant peer-reviewed literature is detailed below.

Search strategy

We conducted a structured search of bibliographic databases and other sources for peer-reviewed and grey literature addressing the three questions. Searches were limited to literature published in English from January 2013 to April 2023.

Peer-reviewed literature

In April 2023, we searched four electronic scientific bibliographic databases (MEDLINE, CINAHL, Scopus and the Cochrane Database of Systematic Reviews) for peer-reviewed literature (see Appendix 2, Table A2.1). We conducted a single search to capture literature addressing all three questions. The search strategy was translated to fit the requirements of each database using the Polyglot Search Translator.[6]

Grey literature

We searched the websites of the following national and international organisations for grey literature:

- Australian Department of Health and Ageing
- Australian state government health departments
- National Health Service (NHS) UK
- Cancer Research UK
- Canada Health
- Canadian Cancer Society
- Ministry of Health New Zealand.

Inclusion criteria

Studies were included if:

- Study design: systematic reviews, randomised controlled trials (RCTs; including feasibility and pilot trials), quasi-experimental trials with comparison/control groups
- Country: Australia, UK, US, New Zealand, Canada
- Participants: nicotine dependent adults (18yrs+) using combustible tobacco products (cigarettes, cigars, shisha, hookah) and/or electronic cigarettes
- Settings: acute inpatient healthcare services, outpatient healthcare settings, community-based healthcare settings
- Interventions to manage nicotine dependence and/or support cessation of tobacco smoking and e-cigarette use: behavioural interventions (e.g. brief advice, AAH—Ask, Advise, Help model, 5As model, motivational interviewing (MI)) and pharmacological interventions (e.g. NRT, varenicline, bupropion)
- Outcomes: studies reporting outcomes of effectiveness for interventions to manage nicotine dependence or support cessation.

Exclusion criteria

Studies were excluded if:

- Non-controlled studies or non-systematic reviews; qualitative studies, protocols, commentaries, case studies, conference abstracts
- Studies outside of clinical settings (e.g. population-level health programs in education settings, local councils etc.)
- Studies that used e-cigarettes as a tobacco cessation tool

- Interventions that could not be feasibly* implemented by NSW Health staff as part of their routine clinical work (**feasible interventions are brief, easy to deliver and are reliant on resources readily available*)
- Non-clinical interventions: studies focused on regulatory, policy measures or health promotion
- Studies with people aged under 18 years
- Primary outcomes not focused on the effectiveness of clinical interventions (e.g. attitudes towards cessation, dependency measures or factors influencing cessation)
- Published prior to 2013
- Non-English language
- Studies conducted outside of country inclusion list.

Outcomes

Q1A) managing nicotine dependence while staying in an inpatient setting:

- Not tobacco smoking/vaping on any NSW Health buildings and grounds
- Abstinence during hospital stay (include longitudinal evidence if available)
- Management of withdrawal symptoms in an inpatient setting
- Not leaving against medical advice due to nicotine withdrawal
- Acceptability for consumers and clinicians.

Q1B) supporting smoking and e-cigarette cessation:

- Quit rates / abstinence (at relevant time intervals)
- Uptake of smoking and e-cigarette cessation programs after the brief intervention
- Intention to quit/stay quit
- Acceptability for consumers and clinicians.

Q2) extract Q1 outcomes from studies delivering interventions to patients from the following special interest groups:

- Aboriginal and Torres Strait Islander people
- Pregnant women
- Mental health service consumers
- Patients experiencing AOD use
- Dual users of e-cigarettes and tobacco products
- E-cigarette users who do not use other tobacco products.

Q3) extract from findings and author insights in discussions of Q1 studies:

- Barriers to implementation of brief interventions in healthcare settings to manage nicotine dependence among inpatients, and support smoking and e-cigarette cessation

- Enablers to implementation of brief interventions in healthcare settings to manage nicotine dependence among inpatients, and support smoking and e-cigarette cessation
- Barriers and enablers specific to interventions delivered to Q2 special interest population groups.

Screening of literature

We used Covidence systematic review software to manage all parts of the review process from screening to extraction (Veritas Health Innovation). Potentially relevant citations were exported from the databases and imported into Covidence. Title and abstract screening was conducted by two reviewers working independently (KM, AG, AD, JR, JT, LM, OE, SI, MJ). One reviewer conducted full-text review with second-reviewer confirmation (KM, AG, JT, SH). During full-text review (non-Cochrane) systematic reviews had their included studies searched for relevance against our own inclusion criteria to ensure our search strategy had already captured and included these studies. The systematic review itself was then excluded (as they contained studies published prior to 2013 and studies conducted outside of healthcare settings). Identified Cochrane reviews were included intact. See the PRISMA flowchart presented in Appendix 3, Figure A3.1.

Data extraction

One team member extracted key information from included primary studies and a second team member checked all data extracted to confirm completeness and accuracy (AD, AG, JR, JT, KM, LM, MJ, OE, SI, NH, SH) (see Appendix 4, Table A4.1). Relevant Cochrane systematic reviews (n=25) had main conclusions extracted and added to a systematic review summary table (see Appendix 5, Table A5.1).

Quality assessment

We used the National Health and Medical Research Council's (NHMRC) Levels of Evidence and Grades for Recommendations for Guideline Developers

Data synthesis

Data were summarised in a narrative synthesis.

Results

Database searches identified 11,308 potentially relevant citations. After removal of 4309 duplicates, 6999 titles and abstracts were screened against inclusion and exclusion criteria and 6657 were

excluded. Full reports of 342 studies were retrieved and screened against inclusion and exclusion criteria; 268 of these were excluded leaving 74 studies to be included in the review: 47 primary studies and 27 systematic reviews (Figure 1).

Levels of evidence

The quality of evidence of included studies was high. The 27 systematic reviews all reported meta-analyses of RCTs and were Level I intervention evidence. Forty-seven of the primary studies included in this Evidence Check were of Level II evidence.

Table 1—Level of evidence summary for literature included in the Evidence Check

Level of evidence		Description	Number of studies	Study reference
I		A systematic review of Level II studies	27	7–34
II		A randomised controlled trial	47	35–81
III	**III-1**	A pseudo-randomised controlled trial (i.e. alternate allocation or some other method)	0	
	III-2	A comparative study with concurrent controls (i.e. non-randomised experimental trials, cohort studies, case-control studies, interrupted time series studies with a control group)	0	
	III-3	A comparative study without concurrent controls (i.e. historical control study, two or more single arm studies, interrupted time series studies without a parallel control group)	0	
IV		Case series with either post-test or pre-test/post-test outcomes	0	
TOTAL			74	

Findings

Overall, 27 systematic reviews were included in this Evidence Check, 25 of them Cochrane reviews. It is important to note that these reviews are not limited to studies conducted in healthcare settings; however, they offer critical high-level evidence on the smoking cessation interventions of interest. Further, while Cochrane reviews published from 2013 onwards have been included, the reviews themselves contain studies published prior to 2013.

Appendix 5 presents a summary of evidence from 17 reviews related to a range of smoking cessation pharmacotherapies and behavioural support interventions relevant to Question 1. In short, adding behavioural support (in person or via telephone) to pharmacotherapy increases quit rates. Varenicline is the most effective licensed pharmacotherapy to achieve cessation and assist in relapse prevention, followed by combination NRT (cNRT). Behavioural support for smoking cessation can increase long-term quit rates, and although individual counselling is more effective than minimal contact, brief advice, text-messaging and self-help materials all produce at least a small positive effect on cessation rates.

The remaining 10 reviews are summarised in response to Questions 1 and 2 below where they are relevant to specific settings or special interest populations. Appendix 5, Table A5.1 presents a summary of extracted information from all 27 reviews included in the Evidence Check.

Question 1: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

1a—Manage nicotine dependence during inpatient stay

We identified 17 studies that were conducted in acute inpatient care settings. *However, no studies assessed the pre-specified outcomes of interest* (abstinence during inpatient stay, withdrawal symptoms during inpatient stay, violation of smoke-free policies, or self-directed discharge) *for managing nicotine dependence during inpatient stay as either primary or secondary outcomes of effectiveness*.

The majority (12 out of 17) of inpatient studies provided a combination of pharmacotherapy (usually NRT) and behavioural support (e.g. brief advice or referral to quitline) to manage nicotine dependence during admission as part of usual care (i.e. control condition) for the respective acute inpatient care settings. This indicates that **interventions combining pharmacotherapy and brief behavioural support to manage nicotine dependence during admission continue to be best practice for acute inpatient care settings.**

Six of the 17 inpatient studies, all conducted in hospitals, trialled interventions to optimise 'usual care' management of and treatment for nicotine dependence during acute inpatient stay.[52, 55, 57, 67, 75, 77] Two of these studies had hospital pharmacists deliver tobacco smoking cessation interventions to inpatients with the aim of increasing uptake of supports as well as increasing abstinence rates post discharge. In Gupta et al.[55] patients received cessation counselling and were directly assisted by pharmacists to obtain NRT on ward. Pharmacists referred patients to quitline and ensured they were discharged with a script to continue nicotine patches commenced during stay. Significantly more patients in the intervention vs the control arm were prescribed NRT during admission (82% vs 24%, X^2 = 33.76, p<.0001) and reported using NRT post discharge at three-month follow-up (56% vs 28%, OR 3.2, CI 1.2,8.2, p=0.02). No differences were seen in seven-day point prevalence abstinence (PPA) rates (18% vs 15%) at three-month post discharge follow-up. In Thomas et al.[75] pharmacists delivered cessation counselling based on the 5As framework during admission (~30 minutes), at discharge (~5 minutes), and at one-month post discharge (~5 minutes), provided pharmacotherapy during stay (and at least one-week's supply on discharge), referred to quitline, and sent educational resources and treatment plans to patients' general practitioners. Significantly more intervention patients used pharmacotherapy during admission (52% vs 53%, p=0.016), were discharged with pharmacotherapy (48% vs 30%, p<0.0001), and used pharmacotherapy post discharge (60% vs 44%, p<0.0001). Cessation rates did not differ between intervention and usual care at six (11.6% vs 12.6%) or 12 months (11.6% vs 11.2%). **Assisted provision of pharmacotherapy by dedicated healthcare staff (e.g. pharmacist) during admission increases use of smoking cessation pharmacotherapy both during inpatient stay and post discharge.**

Another three[52, 67, 77] of the six studies optimising inpatient usual care for nicotine dependence focused on assisted referrals to quitline during inpatient stay. Warner et al.[77] had study personnel deliver brief advice and directly connect intervention patients to quitline counselling services via a warm handover and, consistent with usual care, offered NRT during stay and on discharge. Quitline intake calls were completed in hospital by 65% of the intervention group (195/300 vs 1/300 control group). No difference in seven-day PPA at six-month follow-up was observed between intervention and control (self-reported: 24% vs 24%, p=1.00; biochemically confirmed: 11% vs 7%, p=0.07). Richter et al.[67] compared quitline direct connection via warm handover during stay to quitline fax referral at discharge, where all patients also received NRT during stay and cessation counselling to develop quit plans. Significantly more warm handover than fax referral participants enrolled in quitline services (99.6% vs 59.6%, p<0.001). No differences were observed in verified abstinence rates at six-month follow-up (25.4% vs 25.3%, p=0.88). In Fellows et al.[52], tobacco treatment specialists (medical practitioner assistant, research nurse or health educator, depending on study site) delivered a bedside cessation consult based on the first four of the 5As (~15 minutes), then intervention participants received an assisted referral to quitline (via warm handover or fax referral; site-dependent), had pharmacotherapy included in discharge orders, had discharge summaries sent to general practitioner, and received seven-week Interactive Voice Recognition (IVR) support to provide follow-up for treatment plans initiated during hospitalisation. Patients in the assisted referral arm

(compared with the usual care arm) had significantly higher rates of referral to outpatient counselling (e.g quitline; 58% vs 2%, p<0.001), quit medications at discharge (42.7% vs 7.6%, p<0.001), or both (28% vs 0.3%, p<0.001). Self-reported 30-day abstinence did not differ at six-month follow-up between intervention and control. **Direct or assisted connection to quitline during an inpatient stay significantly increases uptake of the service.**

Finally, Kumar et al.[57] conducted a pilot feasibility RCT trialling medical student-led bedside cessation counselling (~15 minutes), placing stickers on patients' medical charts to prompt the treating clinician to provide pharmacotherapy. No difference in the primary outcome of motivation to quit was observed, and intervention and control groups similarly reported being prescribed pharmacotherapy on discharge (15.2% vs 17.7%, p=0.783). However, patients rated students as being very knowledgeable about quitting and somewhat helpful, and although significantly more patients in the intervention group reported seven-day PPA at three months post discharge this effect was not seen at six months, and should be interpreted with caution due to small study numbers. When considered in combination with the provision of care delivered in the studies described above, **brief tobacco smoking cessation intervention can be feasibly delivered by a range of healthcare providers during an inpatient stay.**

The remaining 11 inpatient studies, while initiating care during inpatient stay, then focused on either providing or connecting patients to substantive ongoing pharmacological or behavioural intervention post discharge in order to support cessation. These studies have been described in section ***Q1b)*** *Inpatient Settings* below.

1b) Support cessation of smoking and e-cigarette use

Overall, 40 trials (reported in 41 studies) assessed interventions to support cessation of tobacco smoking in healthcare settings.

Thirty-eight trials (reported in 39 studies) used multi-component interventions that combined pharmacotherapy with behavioural supports. Pharmacotherapies tested were varenicline, bupropion, and NRT. Behavioural supports tested were quitline referral, brief cessation counselling (i.e. single instance of brief advice or counselling) primarily based on the 5As, multi-session counselling delivered via telephone check-ins or repeat clinic visits / appointments, provision of self-help materials and sending treatment plans to other healthcare professionals.

When considered with the evidence from systematic reviews, **varenicline combined with multi-session counselling (that spans the full treatment course) or cNRT plus multi-session counselling are the multi-component interventions with best evidence to support cessation from tobacco smoking.**

No studies targeted cessation from e-cigarettes. There is a lack of research trialling strategies to support long-term e-cigarette cessation.

In the section below we have described studies conducted in inpatient and outpatient healthcare settings.

Inpatient settings

Initiating pharmacotherapy during inpatient stay that continues post discharge and is supported by ongoing behavioural counselling for the full treatment period is recommended to support cessation.

Eleven studies were conducted in inpatient settings that focused on supporting cessation post discharge: hospitals (n=7), psychiatric inpatient units (n=3), and AOD residential rehabilitation services (n=1).

An additional three studies recruited participants via both inpatient and outpatient settings: AOD settings (n=2), and vascular surgery setting (n=1).

All studies conducted in an inpatient setting used an inpatient stay as an opportunity to support continued abstinence post discharge.

Only one study[61] assessed single-strategy intervention, using brief behavioural support during inpatient stay at hospital combined with extended counselling post discharge. All other studies **(93%) conducted in inpatient settings trialled interventions combining pharmacotherapy with behavioural support.**

Six trials (reported in seven studies[40, 43, 50, 64, 70, 71, 80]) tested interventions that significantly increased quit rates. Three trials (reported in four studies[43, 50, 71, 80]) demonstrated varenicline initiated during inpatient stay and combined with multi-session counselling (delivered by either study staff or quitline) significantly increases long-term quit rates post discharge. Another three trials found multi-component interventions combining brief advice, NRT and some form of ongoing behavioural support (e.g. quitline or other multi-session counselling) significantly increase abstinence rates post discharge.

We identified one systematic review[27] that assessed interventions to maintain abstinence following a stay in a smoke-free setting (i.e. inpatient mental health, substance misuse or acute hospital settings; prisons). Shoesmith et al. concluded behavioural and pharmacological support can be effective in maintaining abstinence, and identified a number of behavioural change techniques (e.g. pharmacological support, goal-setting (behaviour) and social support) as promising in terms of probable effectiveness and feasibility.

Pharmacotherapy

Varenicline

Four studies reported on three trials assessing the use of varenicline and behavioural support in hospital[43, 50, 71] and addiction treatment centre[80] settings.

In all studies varenicline treatment was initiated with the participant as an inpatient and provided as a 12-week standard course. Two studies reported on one trial comparing 12 weeks of varenicline plus

quitline counselling (n=196) with quitline counselling alone (n=196). Significantly more participants were continuously abstinent in the varenicline plus counselling arm compared with counselling alone at both the 12-month follow-up (31.1% vs 21.4%, RR 1.45, 95%CI 1.03–2.03, p=0.03)[71] and the two-year follow-up (29.2% vs 18.8%, OR 1.78, 95%CI 1.10–2.86, p=0.02).[43] Eisenberg et al.[50] combined varenicline with low-intensity counselling via six sessions over 24 weeks (n=151) compared with placebo plus counselling (n=151), and found seven-day PPA rates at six-month follow-up were higher for varenicline vs placebo (47.3% vs 32.5%, p=0.012). Finally, Zawertailo et al.[80] conducted a pilot RCT to compare varenicline combined with weekly brief counselling (over a 12-week treatment course) (n=16) with placebo plus counselling (n=15). At end of treatment at week 12 significantly more varenicline than placebo participants had quit tobacco smoking (n=7 vs n=1, $X^2(1) = 5.56$, p=0.037). **Varenicline initiated during inpatient stay and supported by multi-session behavioural support significantly increases long-term tobacco smoking cessation.**

Bupropion

One study[49] assessed provision of bupropion plus brief advice to hospital inpatients with myocardial infarction compared with placebo, finding no difference in abstinence rates during or up to 12-months follow-up.

NRT

Eight inpatient studies referred to provision or use of some form of transdermal or transmucosal NRT.[40, 47, 54, 64, 65, 68, 70, 74] Most notably, five of the eight trials[40, 65, 68, 70, 74] described NRT use as part of both intervention and control / comparison condition. **Provision of NRT during admission (plus limited supply or prescription on discharge) is routine care in inpatient healthcare settings.**

Three studies paired NRT with combinations of brief advice, self-help materials and/or referral to quitline. One study[64] demonstrated intervention effectiveness. Prochaska et al.[64] randomised participants in an acute psychiatry unit to a computer assisted intervention, printed work manual, letter to healthcare provider, brief advice and 10-week patch supply at discharge, compared with usual care. Verified seven-day PPA was significantly higher for intervention than usual care at follow-ups at months three (13.9% vs 3.2%), six (14.4% vs 6.5%), 12 (19.4% vs 10.9%), and 18 (20% vs 7.7%; OR 3.15, 95%CI 1.22–8.14, p=0.018). Guillaumier et al.[54] conducted an organisational change intervention providing NRT to AOD services to deliver to patients at their discretion (along with staff training to support delivery of brief advice and referral to quitline) compared with usual care control. They found no effect on verified seven-day PPA quit rates at eight-week follow-up (2.6% vs 1.8%, OR 1.72, 95%CI 0.5–5.7, p=0.373); however, there was an impact on uptake with significantly more participants in the intervention group reporting use of NRT (37% vs 23%, OR 2.01, 95%CI 1.3–3.0, p<0.001), and reporting they received it from the AOD clinic they were recruited from (33% vs 14%, OR 3.79, 95%CI 2.0–7.3, p<0.001). Finally, Cummins et al.[47] conducted a 2x2 factorial design study (n=1270) comparing usual care, nicotine patches only (eight-week supply), counselling (quitline) only, or patches plus counselling. The 30-day abstinence rate at six-month follow-up was 22.8% for nicotine patch vs 18.3% for no patch (p=0.051), and 20.0% vs 21.2% for counselling and no counselling conditions (p=0.651). **NRT can be successfully provided as part of a multi-component intervention to support cessation post discharge.**

Behavioural support

All 11 studies conducted in inpatient settings to support cessation post discharge included behavioural support. Only one study[61] assessed behavioural support alone, while the remaining 10 studies combined behavioural and pharmacological supports. The types of behavioural support reported included quitline referral (n=8), brief advice (n=5), multi-session counselling (n=10), self-help materials (n=7), and discharge summaries/treatment plans sent to the general practitioner (n=1). It was common for interventions to use a combination of different behavioural supports, such as brief advice by a healthcare provider during inpatient stay along with a referral to quitline for post-discharge counselling, and self-help materials provided alongside a referral to quitline.

Quitline referral

Eight studies[40, 43, 47, 54, 61, 70, 71, 74] conducted in inpatient settings used referral to a telephone quitline as part of intervention and/or comparison/control conditions. **Most studies used quitline referral as one strategy within a multi-component intervention also incorporating pharmacotherapy and other brief advice or cessation counselling from healthcare providers.** Two studies[43, 71] included a proactive quitline referral as standard care across all trial conditions. Sherman et al.[70] compared referral to quitline with intensive telephone counselling by study staff where both groups received an eight-week NRT supply, finding that although the intensive counselling was more effective, both groups had excellent 30-day PPA quit rates at six-month follow-up (37.4% vs 31.5%). Matuszewski et al.[61] combined brief advice using 5As with quitline referral and found, compared with a no-counselling control condition, those who received the brief counselling were more likely to accept a quitline referral (OR 2.3, 95%CI 1.0–5.1) and to use the quitline service (OR 5.3, 95%CI 0.6–44.9). Brown et al.[40], as part of a multi-component intervention, had study staff deliver (alongside usual care + NRT supply on discharge) a 40-minute inpatient motivational interview session closing with an offer to enrol patients in a proactive quitline program. Intervention participants (compared with a usual-care control group that received brief advice and NRT during stay) were significantly more likely to report at the six-month follow-up seven-day PPA (8.9% vs 3.5%; AOR 2.95, 95%CI 1.24–6.99, p=0.01) as well as having engaged in quitline counselling (37.3% vs 11.1%; RR 3.39, 95%CI 2.13–5.42, p<0.001). However, it should be noted that a number of studies reported about half or less of participants randomised to receive quitline referrals as part of their intervention actually engaged in counselling with the service: 49%—Sherman et al.; 47%— Cummins et al.; 27.9%—Stockings et al.). **Quitline referral can be feasibly delivered as part of an effective intervention to increase tobacco smoking cessation; however, assisted connection should be considered to increase service engagement.**

Brief cessation counselling

Brief cessation counselling involved one session during inpatient stay. Any studies that included brief advice at the bedside *as well as* any cessation counselling contact points post discharge are described in the multi-session counselling section below.

Five studies conducted in an inpatient setting used one brief counselling session during inpatient stay as part of their intervention. In one of these studies the multi-component intervention produced a significant effect on quit rates.[64] Prochaska et al.[64] delivered a 15–30-minute brief counselling session to acute psychiatric inpatients alongside a computer-assisted intervention, print manual, letter to GP and 10-week supply of nicotine patches. The intervention, when compared with usual care control,

resulted in higher verified seven-day PPA rates at three-, six- and 12-month follow-up (rates reported above). In another two studies[54, 61] brief intervention was delivered as part of a multi-component intervention that resulted in increased uptake of pharmacological or behavioural supports. Brief advice was delivered by a range of healthcare providers, including surgeons[65] and AOD workers[54], or by trained study research personnel.[61, 64, 68] **Brief counselling ranged from 5–45 minutes for a session, on average about 15 minutes and using brief advice based on the 5As or a motivational interview style cessation counselling format. Where specified, topics covered consequences of tobacco smoking related to inpatient diagnosis, pros/cons of tobacco smoking, managing withdrawal symptoms, developing quit plans, and covering other intervention components.** In all studies brief cessation counselling was combined with the provision of pharmacotherapy, a referral to quitline, or both. **Brief cessation counselling can be feasibly delivered to patients by a range of healthcare providers during inpatient stay to initiate and/or sustain cessation and to support provision of pharmacotherapy or enrolment in further behavioural support.**

Self-help materials

Five studies referenced the use of self-help materials; two studies used them as one strategy within a multi-component intervention[64, 74] and two studies included self-help materials as part of both intervention and control conditions.[40, 43] **Generally self-help materials (also referred to as educational resources, brochures, manuals) provided supplementary information about other intervention components, for example quitline brochures or information on NRT use.** Only Prochaska et al.[64] used a more in-depth printed treatment manual for patients to work through as part of their multi-component intervention; however, no information on use/completion of these manuals was provided in study results. **Self-help materials are included as adjuncts to support other strategies within multi-component interventions.**

Treatment plan sent to GP

One study[64] sent letters to an inpatient's GP to request cessation support post discharge; however, no data were reported on this component of the intervention.

Multi-session counselling

Eight studies used multi-session counselling as part of multi-component interventions.[40, 49, 61, 68, 70, 74, 80] Seven studies used a brief advice intervention during inpatient stay and then followed up over multiple sessions ranging from one or two booster sessions[68], between four and eight sessions over a six-week to 12-month period either via telephone or during clinic visits[49, 50, 61, 70, 74], through to 12 weekly face-to-face sessions.[80] Only one of these post-discharge multi-sessions was conducted by a healthcare professional (nurse).[49] Another study used Interactive Voice Recording (IVR) as the follow-up mechanism after a brief intervention with a healthcare practitioner during inpatient stay.[40] **Sessions generally covered progress, use of other intervention supports, withdrawal symptoms, quit barriers and enablers, developing or enhancing quit plans and referral to other supports.**

Among the studies that used multi-session counselling as part of multi-component interventions, four produced significant increases in quit rates.[40, 50, 70, 80] Eisenberg et al.[50] and Zawertailo et al.[80] both used weekly (brief) cessation counselling sessions to support a 12-week course of varenicline (initiated during inpatient stay and continued post discharge), compared with placebo plus

counselling. Abstinence rates were higher among intervention than control groups in both studies: Eisenberg et al.[50] (verified seven-day PPA at six months 47.3% vs 32.5%, p=0.012) and Zawertailo (verified seven-day PPA at 12 weeks 43.8% vs 6.7%, p=0.037). Sherman et al.[70] compared post-discharge multi-session counselling (seven sessions over six to eight weeks) by study staff with quitline referral, where both groups received an eight-week supply of NRT. Self-reported 30-day abstinence rates at six months were higher in the multi-session than the quitline arm (37.4% vs 31.5%, RR 1.19, 95%CI 1.01–1.40). Finally, Brown et al.[40] compared a sustained care intervention (inpatient motivational interviewing (MI), referral to quitline, up to eight weeks' supply of NRT patches on discharge, and IVR follow-up over 12 weeks (multi-session brief counselling)), to usual care (i.e. no support post discharge). Participants in the sustained care group evidenced significantly higher verified seven-day PPA rates at six-month follow-up than those in the usual care group (8.9% vs 3.5%; OR 2.95, 95%CI 1.24–6.99, p=0.01). **Effective interventions delivered multi-session behavioural counselling over the full treatment course of supplied pharmacotherapy.** Two studies using multi-session counselling as one strategy within multi-component interventions resulted in increased uptake of other intervention components such as pharmacotherapy use or quitline enrolment.[40, 61]

Outpatient and community-based settings

Multi-component interventions combining pharmacotherapy (varenicline, cNRT) with multi-session behavioural support increase abstinence rates among patients accessing outpatient and community-based healthcare settings.

A total of 19 studies were conducted in outpatient settings: stop smoking clinics (n=3), pharmacies (n=1), vascular surgery practice (n=1), preoperative clinics (n=3), elective surgery wait list (n=1), cancer centre (n=1), hepatology clinic (n=1), lung cancer screen clinics (n=1), community health clinic (n=1), clinical research sites (n=1), general practice (n=2) and emergency department (n=3).

A further eight studies were conducted in outpatient settings among priority groups that are included in Question 2 below: emergency department (n=1), opioid dependence treatment clinics (n=1), substance use treatment program (n=1), community (n=1), mental health clinics (n=2) and pregnancy outpatient treatment (n=2).

One study[39] assessed single strategy intervention. Brown et al.[39] tested weekly self-incentivising self-rewards for not having smoked and found significantly higher quit rates (verified 28-day PPA at three months 34.1% vs 15.38% p=0.05) at three months for this intervention compared with a simple quit plan control condition.

All other primary studies conducted in outpatient settings trialled multi-component interventions.

Fourteen (out of 27) studies conducted in outpatient and/or community healthcare settings tested interventions that significantly improved quit rates. Nine trials (reported in 10 studies[35, 37, 41, 44, 48, 58, 59, 62, 78, 79]) demonstrated pharmacotherapy combined with multi-session behavioural support (delivered via quitline or at repeat clinic visits) significantly increased quit rates. Four trials[36, 38, 42, 56] combined brief advice with pharmacotherapy (three used NRT, one used varenicline) to significant effect.

Four Cochrane reviews were specifically relevant to supporting cessation in outpatient settings. These reviews focused on tobacco smoking cessation interventions delivered preoperatively[31], in community pharmacies[10], primary care settings[21] and by dental professionals[18] (see Appendix 5, Table A5.1). Thomsen et al.[31] concluded providing behavioural support and offering NRT may increase short-term cessation and reduce postoperative morbidity; however, optimal intervention intensity remains unknown. Carson-Chahhoud et al.[10] concluded, with low-certainty evidence, that community pharmacists can provide effective behavioural support to people trying to stop tobacco smoking. Lindson et al.[21] concluded provision of adjunctive counselling by an allied health professional, cost-free pharmacotherapy, and tailored printed materials as part of tobacco smoking cessation support in primary care increase quit rates. Holliday et al.[18] found very low-certainty evidence to suggest quit rates increase when dental professionals offer behavioural support, and moderate-certainty evidence that abstinence rates increase if this behavioural support is combined with pharmacotherapy.

Pharmacotherapy

Varenicline and NRT demonstrate effectiveness in supporting cessation. Bupropion may be marginally more effective than single formulation NRT; however, it is less well tolerated and adhered to.

Varenicline

Nine studies assessed the use of varenicline in mental health settings[35, 44], AOD settings[56, 62, 73], and other outpatient settings.[48, 69, 79, 81]

Varenicline treatment was combined with either quitline support plus brief counselling from a health professional[62, 79], other pharmacotherapy plus one session of brief counselling[56], other pharmacotherapy plus multi-session counselling[48, 81], multi-session counselling[35, 69], or brief counselling.[44, 73]

Six studies provided varenicline as a 12-week course[35, 44, 48, 56, 62, 79], two studies provided a 24-week course[69, 73] and one study provided an eight-week course.[81] In the six studies that provided a 12-week course, varenicline significantly increased abstinence at end of treatment, and effects persisted through 12 months for Wong et al.[79] In the Wong study, acceptability of varenicline was demonstrated by many participating patients seeking the free three-month supply of varenicline.

Bupropion

Five studies assessed provision of bupropion in pregnancy settings[63] (Nanovskaya 2017), mental health settings[35], general practice[81], clinical research sites[48] and a smoking cessation clinic.[72]

Bupropion treatment was combined with either multiple brief counselling sessions[35, 63], multiple counselling sessions plus quitline support[81], brief advice over the course of treatment[48], or NRT and behavioural support[72], to mixed effect. Two studies[35, 48] demonstrated increased abstinence at the

end of treatment (12 weeks): one in a mental health outpatient clinic comparing varenicline, bupropion, nicotine patch and placebo [OR (95%CI) varenicline vs placebo 2.74 (2.28–3.30), p<0.0001; bupropion vs placebo 1.89 (1.56–2.29), p<0.0001; NRT patch vs placebo 1.81 (1.49–2.19), p<0.0001; varenicline vs NRT patch 1.52 (1.29–1.78), p<0.0001; bupropion vs NRT patch 1.04 (0.88–1.24), p<0.0002; varenicline vs bupropion 1.45 (1.24–1.70), p<0.0001], the other in clinical research sites comparing varenicline and bupropion combination therapy with varenicline monotherapy, with brief behavioural counselling during clinic visits in both arms (verified seven-day PPA 56.2% vs 48.6%, OR 1.36 (95%CI 0.95–1.93), p=0.09). One study compared bupropion to placebo with nurse-led counselling sessions in both arms for pregnant outpatients, finding no significant difference at the end of treatment (although there was a difference in favour of the intervention during the treatment period (verified seven-day PPA 17% vs 3%, p=.087)[63]. A cluster-randomised trial of enhanced in-practice support compared intervention one: practice nurse assisted development of a quit plan based on the 5As, plus an additional three face-to-face visits or referral to quitline plus buproprion (or varenicline—see above section), with intervention 2: GP brief advice plus pharmacotherapy and quitline referral, and control: usual care. It found no significant difference in quit rates at any follow-up.[81] Stapleton et al.[72] also tested two interventions: bupropion and bupropion plus NRT, compared with NRT (control), with seven weekly behavioural support sessions in all three arms. They found no effect on quit rates, with some evidence that bupropion may be more beneficial than NRT for those with a history of depression. In terms of acceptability, there was a significantly poorer level of adherence to bupropion than to NRT among those abstinent at four months in this study.

NRT

Sixteen outpatient studies referred to provision or use of NRT. Nine trials (reported in 10 studies[36, 38, 41, 42, 56, 58-60, 66, 78]) paired NRT with combinations of brief advice, self-help materials, referral to quitline, counselling, and/or other pharmacotherapy, and found significant effects in favour of the intervention. Four studies used NRT as part of their control[51, 56, 60, 72], providing some evidence that NRT is accepted usual care in outpatient healthcare settings. King et al.[56] and Bernstein et al.[36] were both conducted in AOD populations and found varenicline, NRT patch and brief counselling and brief MI, brochure, NRT supplied at ED visit with follow-up call led to significantly higher quit rates at 12 weeks (44.3% vs 27.9%; OR, 2.20; 95% CI, 1.01–4.80; p=.047) and three months (seven-day PPA, 14.6% vs 0.0%, p=.02) respectively. Webb et al.[78] and Lee et al.[58, 59] were both conducted with pre-surgery populations and tested NRT, quitline support and brochures (with the addition of brief advice from a nurse in Lee et al.) compared with usual care. The intervention groups had significantly higher quit rates: four-weeks prior to operation (Webb et al.: 9% vs 4%, OR 2.20 95%CI 1.08–4.50); on the day of surgery (Webb et al., Lee et al.); 30 days post-operation (self-reported cessation 28.6% vs 11% RR = 2.6, 95% CI 1.2–5.5, p = 0.008) (Lee et al. 2013) and12-months post-operation (Lee 2015; 25% vs 8%, RR 3.0 95%CI 1.2–7.8, p=0.018). Lee et al. reported that among intervention participants 83.1% felt better supported in quitting about the time of surgery than 49.3% in the control (RR = 1.69, 95% CI 1.3–2.2, p < 0.0005).

Buttery et al.[41] and Reid et al.[66] were conducted in outpatient lung cancer screening and hepatology clinics respectively. They tested nurse support; six sessions plus support by a trained tobacco smoking cessation counsellor and access to pharmacology[41]; and one telephone counselling session plus eight weeks of NRT[66], and, compared with brief support controls, found higher quit rates (self-reported seven-day PPA 29.2% vs 11% $\chi 2$ 3.98, p=0.04[41]) and lower cigarettes per day (CPD)[66] at three months (reported reduction of 6.7, 95%CI: 3.0,10.4, t= 2.022, p=.048). Carpenter et al.[42]

compared standard care (self-help material; providers encouraged to provide cessation advice) to two weeks of NRT (patches and lozenges) plus standard care in primary care and found higher quit rates in favour of the intervention condition at six months (seven-day PPA 12% vs 8%, aOR 1.7, 95%CI 1.1–2.6). This trial reported uptake of any cessation medication in the six-month study period was 65% (intervention) vs 25% (control).

Bernstein et al.[38] used a 2x2x2x2 factorial design to test 16 conditions of all combinations plus no treatment control (brief MI plus brochure with quitline number, six weeks of NRT (patches and gum) with the first patch applied by a nurse in ED plus brochure, active quitline referral and brochure, and enrolment in SmokefreeTEXT short SMS program and brochure) in an ED. Quit rates were significant at three months for the NRT (22.0% vs 15.8% OR 1.5 95%CI 1.1–2.1) and texting (21.4% vs 16.4% OR 1.5, 95%CI 1.1–2.1) interventions.

Behavioural support

All studies using behavioural support used this as part of a multi-component intervention. The types of behavioural support included quitline referral (n=9), brief cessation counselling (n=15), multi-session cessation counselling (n=10), and self-help materials (n=8).

Quitline referral

Nine trials conducted in outpatient settings used referral to a telephone quitline as part of either intervention.[37, 38, 53, 58, 59, 62, 76, 78, 79, 81] One study[38] included a proactive quitline referral in the quitline and brochure arm of their factorial design study. The remainder were fax, online or unspecified referrals. All studies used quitline referral as one strategy within a multi-component intervention also incorporating pharmacotherapy and/or brief advice or cessation counselling. Two studies reported increased quitline uptake rates (Bernstein et al.[37]: 32.0% vs 18.8% ,OR 2.04, 95% CI 1.46–2.84) (Vidrine et al.[76]: 23.6% vs 0.5%, p=0.00005). Lee et al.[58] reported that the quitline established contact with 52% of the intervention group allocated to receive a proactive referral.

Brief cessation counselling

Here we refer to brief cessation counselling, meaning one instance of counselling. Any studies that included brief advice *as well as* additional cessation counselling are described in the multi-session counselling section below.

Seven studies used brief advice delivered by a medical practitioner[42, 45, 53, 62], nurse[58, 59, 76, 81], pharmacist or anaesthesiologist.[79] Stein et al.[73] (2013) used the 5As. Cheung et al.[45] also referred to a community cessation counselling service. In the Cheung study, n=412/660 accepted this referral and 50% of those who were reached enrolled in the program. Two studies used brief MI[37, 38] and others described 'brief behavioural counselling'[56] and one telephone counselling session.[66] This was delivered across AOD settings[56, 62, 73], ED[36, 37, 45], primary care[42, 81], community health clinics[76], pre-operative clinics[58, 59, 79], a hepatology clinic[66] and in surgery practice.[53] Across these studies, brief counselling ranged from 30 seconds to 15 minutes (where time was specified).

Brief cessation counselling is feasibly delivered by a range of practitioners across health settings.

Multi-session counselling

Ten studies used more than one instance of cessation counselling and this ranged from brief MI with a follow-up phone call (in an AOD setting[36]), to brief advice at each clinic visit (up to 15[35] and an unspecified number over a 12-week treatment time frame in a mental health setting[44]; up to 11 in clinical research sites[48]), to multi-session counselling. Three studies delivered multi-session counselling delivered by nurses (35-minute initial session[63], up to nine additional sessions of 10 minutes[41]; six sessions plus immediate support from a trained tobacco smoking cessation counsellor) or midwives (up to one hour over four sessions[46]) in obstetrics and gynaecology, lung cancer screening and antenatal clinics respectively.

Stop-smoking services provided behavioural support for up to seven weeks in one study[72]; Schnoll et al.[69] offered seven tobacco smoking cessation counselling sessions over 24 weeks (four in person; three by phone) for cancer outpatients. Farley et al.[51] included eight 10-minute counselling sessions as part of a 2x2 factorial design. Carson-Chahhoud et al.'s Cochrane review assessed community pharmacy interventions for tobacco smoking cessation.[10] The seven studies included in that review used multi-session face-to-face behavioural support delivered by pharmacy staff (where both comparator groups used NRT). The review **concluded that community pharmacists can provide effective behavioural support to people trying to stop tobacco smoking,** although this is based on low-certainty evidence.

Self-help materials

Eight studies referenced the use of self-help materials: all using them as one strategy within a multi-component intervention[36–38, 42, 45, 51, 58, 59, 78]; five studies included self-help materials as part of both intervention and control conditions[36–38, 42, 78]; **indicating that self-help materials are considered a part of usual care in numerous outpatient settings.**

Generally, self-help materials (also referred to as educational resources, brochures, manuals) provided supplementary information about other intervention components, for example quitline brochures or information on NRT use. **As in inpatient settings, self-help materials are included as adjuncts to support other strategies within multi-component interventions.**

Question 2: What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients from special interest population groups to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

Aboriginal and Torres Strait Islander people

We found no brief interventions that evaluated tobacco smoking cessation in Aboriginal and Torres Strait Islander populations and met the Evidence Check inclusion criteria.

Pregnant women

We identified four studies that reported on tobacco smoking cessation interventions in pregnant women. Two were systematic reviews (Level I evidence). One review assessed the effectiveness of psychosocial interventions; the other evaluated the efficacy and safety of pharmacotherapies and e-cigarettes for tobacco smoking cessation. Both reviews included several studies that were conducted before 2013 and/or in non-medical or primary care settings.

The first, examining psychosocial interventions, included 102 RCTs and pseudo-RCTs (Level II and III-1 evidence) involving more than 28,000 women.[11] It reviewed a range of interventions, some that fell outside the scope of this Evidence Check in terms of brevity (primarily incentive-based interventions/contingency management). **High-certainty evidence suggested counselling interventions offered on their own and not as part of a larger intervention were effective at stopping tobacco smoking in late pregnancy.** Feedback showing the impact of tobacco smoking on mother or baby, such as carbon monoxide measurements or ultrasound monitoring, was also considered effective. The evidence for health education, social support, exercise and dissemination strategies to support women to stop tobacco smoking was less certain.

The second study reviewed pharmacotherapies for tobacco smoking cessation during pregnancy.[12] It included evidence from 11 RCTs (Level II evidence) involving 2412 women. Nine studies assessed NRT used alongside behavioural support and two tested bupropion. There were no studies that met the inclusion criteria for evaluating other pharmacotherapies. Low-certainty evidence suggested **NRT plus behavioural support was more effective than behavioural support on its own.** When only RCTs that used placebo NRT as a control (considered to be the fairest test of the intervention itself) were evaluated, there was evidence that NRT was more effective than placebo. **Bupropion appears to be no more effective than placebo in helping women stop tobacco smoking during pregnancy.** Again, this was based on low-certainty evidence.

Two RCTs (Level II evidence) were set in outpatient antenatal clinics, one in the UK, the other in the US. All included pregnant women from 12–13 weeks' gestation who smoked tobacco daily. Treatments trialled included nicotine patches and bupropion (sustained-release), with all offering additional support in the form of either telephone-based or nurse-led behavioural counselling. Neither study demonstrated effectiveness using biochemically verified abstinence measures at the end of pregnancy, although periods of abstinence during pregnancy were reported.

The first compared up to eight weeks of 15mg/16 hour nicotine patch to placebo.[46] There were no differences between groups in prolonged verified abstinence from tobacco smoking between quit date (set two weeks after baseline) and delivery (9.4% vs 7.6%, OR 1.26, 95% CI 0.82–1.96). Women using nicotine patches were twice as likely to be verified abstinent to one month after their quit date, compared with those using placebo patches, but this effect did not persist into later pregnancy. An additional four-week supply of nicotine patches was offered to those who were no longer tobacco smoking at the one month time point but uptake was poor. The authors noted adherence to both types of patch was low.

The second compared 12 weeks of bupropion (sustained-release) with placebo.[63] This study found no significant difference in abstinence rates between the bupropion and placebo groups at the end of treatment, at delivery or at follow-up. Those in the bupropion group were significantly more likely to be abstinent in the previous seven days (19% vs 2% p=0.003) during the treatment assessment period than the placebo group; however, this difference had dropped off by the end of pregnancy. Bupropion

was relatively well tolerated by pregnant participants and was more effective at reducing nicotine craving and withdrawal symptoms than placebo.

Mental health service consumers

We identified seven studies that reported tobacco smoking cessation interventions in mental health treatment settings. These comprised two systematic reviews (Level I evidence) and five RCTs (Level II evidence).

All studies within both systematic reviews were conducted before 2013. One review evaluated randomised controlled trials of treatments for nicotine dependence in individuals who have schizophrenia.[32] **Seven trials compared bupropion with placebo and found tobacco smoking abstinence was significantly higher in the bupropion group than placebo at the end of treatment.** Two studies evaluated varenicline and found tobacco smoking cessation rates at the end of treatment were significantly higher in the varenicline group than placebo. There was no evidence of benefit in trials of NRT and psychosocial interventions for smokers who have schizophrenia to quit or reduce tobacco smoking.

The second review examined 49 RCTs of tobacco smoking cessation interventions for individuals with current or past depression.[33] Studies that added a mood management component to a standard tobacco smoking cessation treatment increased long-term abstinence in individuals with current or past depression. For studies without such a component, including NRT and psychosocial interventions, no evidence of benefit was found. **Low-certainty evidence indicated bupropion was more effective than placebo for long-term abstinence in those with past depression, but not current depression.**

Of the five primary studies, three were delivered as part of an inpatient stay in an acute psychiatric facility and two were for patients of outpatient psychiatric or mental health clinics. One study was conducted across 16 countries, three were conducted in the US and one in Australia. Interventions examined were pharmacotherapy (NRT, varenicline, bupropion) and multi-component counselling-based treatments that incorporated NRT.

Two studies examined the efficacy and safety of 12 weeks of pharmacotherapy treatment in outpatient settings. One international study[35] investigated treatment with varenicline or bupropion (standard doses) and 21mg nicotine patches in equal groups of psychiatric and non-psychiatric participants. Each was compared with placebo, with additional comparisons of varenicline with nicotine patch, bupropion with nicotine patch, and varenicline with bupropion. When 15 weeks' continuous abstinence was verified in psychiatric patients, all treatments were significantly more effective than placebo, with varenicline having the strongest effect (OR 2.74 95%CI 2.28–3.30, p<0.0001). **Varenicline was also superior to both nicotine patch and bupropion, but no difference was found between bupropion and nicotine patch.** No significant increases in neuropsychiatric adverse events attributable to pharmacotherapy relative to nicotine patch or placebo were reported. The second study[44] compared varenicline with placebo in individuals with bipolar disorder. Varenicline was more effective than placebo in achieving past seven-day PPA at treatment end, but the effect did not persist at six months post-treatment (48.4% vs 10.3%, OR 8.1, 95% CI, 2.03–32.5, p=0.002 at three months; 19.4% vs 6.90%, OR 3.2, 95% CI, 0.60–17.6, p=0.17 at six months). Abnormal dreams occurred more frequently in the varenicline group but no other significant adverse neuropsychiatric differences were found.

Three studies compared multi-component treatments combining motivational behavioural supports and NRT with usual care. All were initiated during inpatient stays and included substantial post-discharge support. One study[64] provided a computer-delivered motivational interviewing program, motivational behavioural support, NRT and a referral to outpatient cessation support while in hospital. Post discharge, patients were offered 10 weeks of nicotine patches and the computer program was repeated at three and six months. Past seven-day abstinence was verified at three, six, 12 and 18 months after program commencement. **The treatment group was significantly more likely to be abstinent at all time points than the usual care group and more than three times more likely to be abstinent overall** (13.9% vs 3.2% at three months, 14.4% vs 6.5% at six months, 19.4% vs 10.9% at 12 months and 20.0% vs 7.7% at 18 months). A carbon monoxide level of 10 parts per million or less was used to verify abstinence, a level that is double what is currently recommended to accurately distinguish smokers from non-smokers.[82] The second study[40] issued self-help materials, motivational behavioural support and NRT to individuals receiving psychiatric inpatient care, and then offered up to eight weeks' supply of nicotine patches plus referral to a quit line that offered telephone, text-based, and/or web-based cessation counselling post discharge. **At six months post discharge, the treatment group was almost three times more likely to be verified abstinent in the past seven days than the usual care group** (8.9% vs 3.5%, aOR 2.95 (95%CI 1.24–6.99), p=0.01). The third study[74] supplied self-help materials and motivational behavioural support while in hospital, and 16 weeks of fortnightly telephone support post discharge (this included provision of tailored NRT and referrals to a telephone quit line and to a tobacco smoking cessation group counselling service for people with mental health concerns). **The intervention group was more effective when examining verified past seven-day abstinence at four months** (11.5% vs 2.0% OR 6.46, 95% CI 1.50–32.77) but not at six months post discharge, or when assessing continuous abstinence at four or six months post discharge.

Patients who use alcohol and other drugs

One Cochrane review published in 2016[7] of 35 RCTs evaluated whether interventions for tobacco cessation were associated with tobacco abstinence for people in concurrent treatment for, or had experienced remission from, AOD dependence. **For people with AOD dependence, both in treatment and in sustained remission from other substance dependence, tobacco cessation interventions using pharmacotherapy and combined pharmacotherapy and counselling were associated with increased tobacco abstinence, although this conclusion was supported by low-certainty evidence overall.** In that review, counselling interventions were not associated with tobacco abstinence for people with AOD dependence, but Apollonio et al. noted this finding may be attributable to the clinical heterogeneity of counselling interventions.[7] Tobacco cessation interventions did not appear to influence AOD dependence treatment outcomes.

One other Cochrane review[13, 83] assessed two RCTs of opioid antagonists including individuals with alcohol dependence. **These two studies, reported in 2009 and 2010 as abstracts with limited methodological detail, did not find differences in cigarettes per day for individuals receiving naltrexone compared with placebo.**

Six other studies were identified with patients who use AOD. No studies had the aim of assessing efficacy of strategies to manage patient nicotine dependence to support e-cigarette cessation.

Inpatient Settings

Three studies were conducted with patients receiving AOD treatment in predominantly inpatient settings[54, 68, 80], with two of these studies also including outpatient counselling settings[54] or participants receiving treatment at an outpatient clinic[80]. One study was conducted in a residential AOD treatment service[68], one was in a variety of AOD treatment services (including residential rehabilitation and specialist drug withdrawal services)[54], and one was within a specialised addiction research and treatment centre.[80]

The studies represent a high level of evidence: all were RCTs.

Pharmacotherapy

Varenicline

One study with patients in treatment for alcohol dependence[80] assessed the use of varenicline, where varenicline treatment was initiated following a standard dose escalation schedule and provided as a 12-week course combined with brief weekly manualised individual counselling over the treatment course at in-person study visits. In this study, **provision of combined varenicline and behavioural support (compared with provision of a placebo pill in combination with weekly in-person individual counselling) significantly increased verified abstinence at end of treatment** (measured over the last four weekly visits) (43.8% vs 6.7%, x^2= 5.56, p=0.037). However, differences in abstinence from tobacco smoking between these groups did not persist when measured at 26 weeks after program enrolment. There were no significant differences between treatment groups in changes in adverse effects over the treatment duration.

NRT

In a cluster RCT of an organisational change intervention for AOD services[54], free NRT and referral information for telephone counselling were provided for patient delivery at the discretion of staff, and compared with control services, which continued to provide usual care. This study found **no effect on CO-verified individual client smoking cessation rates between intervention and control services** (n=1 (0.2%) vs 0, p=0.622 at 6.5 months). Participants in intervention services had significantly lower mean cigarettes per day compared with those in control services at eight-week follow-up (n=15 vs 16, 95%CI 0.89 (0.8–1.0) p-value = 0.036), although this difference was not significant at 6.5-month follow-up. Participants attending intervention group services reported higher rates of NRT use overall and receipt of NRT at their clinic at both follow-up time points compared with the control groups.

Behavioural support

Motivational interviewing

One study among people with alcohol dependence in a residential treatment program[68] compared motivational interviewing (MI) with brief advice. Each intervention was delivered by a trained research therapist, either as a single session or with two booster sessions scheduled, and participants were informed of free access to NRT. **Verified abstinence rates at all follow-up time points did not**

differ by treatment or booster allocation (abstinence averages at 10.3% at one month, 1.8% at three months, 2.4% at six months and 1.8% at 12 months).

Outpatient Settings

Three studies were conducted with patients accessing outpatient AOD treatment settings who smoked: one study in an opioid-dependence treatment clinic[73], one in the emergency department for patients with substance use disorders[36], and one in an outpatient substance use treatment program.[62] One additional study[56] recruited people who smoked and drank alcohol at heavy levels in the community, through outreach to local organisations and public advertisements. All studies were RCTs.

Pharmacotherapy

Varenicline

Three of these studies assessed the use of varenicline with patients who use AOD.[56, 62, 73] In these studies, treatment was combined with either nicotine patch (compared with placebo and nicotine patch) plus brief behavioural visits from a trained counsellor at the first two study visits[56], referral to quitline support and brief, individual, in-person counselling from a health professional at five study visits (compared with placebo and equivalent behavioural support)[62], or brief counselling following standardised advice from a study interventionist (compared with varenicline-placebo or NRT patch with NRT gum).[73]

Two studies provided varenicline as a 12-week course[56, 62], one with an option to provide down-titration dosing after 12 weeks.[56] One study provided a 24-week course of varenicline.[73] **In two of these studies[56, 62], varenicline significantly increased tobacco smoking cessation rates at end of treatment** (44.3% vs 27.9%, OR 2.20, 95% CI 1.01–4.80, p=0.047 and 10.5% v 0%, 95%CI 4.4–19.3 p=0.03 respectively). There was lower likelihood of smoking relapse among participants allocated to varenicline in one study[56], and the significant difference in treatment effect in the other study did not persist to follow-up after end of treatment (at 24 weeks).[62] In one study in the opioid-dependence treatment clinic, quit rates did not increase for participants receiving varenicline compared with placebo (3.7% vs 2.2%), and quit rates were slightly higher (8.3%) (but not significantly different) for participants receiving NRT.[73]

NRT

Two studies used NRT patches in combination with varenicline and brief counselling among a community sample of patients who drank heavily[56] and in combination with brief motivational interviewing plus brochure information and telephone follow-up in an emergency department-based intervention for people with substance use disorders.[36] The studies both found **significantly higher quit rates in NRT groups at 12 weeks**[56] (44.3% vs 27.9%, OR 2.20; 95% CI, 1.01–4.80; p=0.047)) and three months (14.6% vs 0.0%, p=0.02).[36]

Dual users of e-cigarettes and tobacco products

We found no studies for this special interest population group.

E-cigarette users who do not use other tobacco products

We did not identify any studies for this special interest population group.

Question 3: What have been the barriers and enablers to implementation of brief clinical interventions in healthcare settings to nicotine dependent patients to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

The following barriers and enablers to implementation of brief clinical interventions in healthcare settings to support nicotine dependent patients to quit have been taken from author insights included in discussion sections of the studies identified to answer Question 1. It is important to note that neither identifying nor reporting barriers and/or enablers to intervention implementation were primary or secondary goals of any studies identified for this Evidence Check. This type of information is typically reported in process evaluation papers, or other descriptive and qualitative studies engaging with service staff and patients. We recommend that an alternative search strategy be developed to adequately evaluate the enablers and barriers to implementation of brief clinical interventions in healthcare settings to manage nicotine dependence and support tobacco smoking cessation (particularly among priority groups).

Implementation barriers and enablers were identified from the Q1 search at provider or patient level, most of which related to general rather than priority populations. Few studies identified these for inpatient contexts, and none addressed these with Aboriginal and Torres Strait Islander people, pregnant women, dual users of e-cigarettes and tobacco products, or e-cigarette users who do not use tobacco products. No studies addressed e-cigarette cessation.

In summary, from the limited data available, implementation **enablers include a smoke-free setting, accessible referral and prescription pathways, subsidised care, and involvement of variety of healthcare staff. Barriers include logistical challenges as patients move through the system and cost in terms of both budget and healthcare staff time.**

a) Manage nicotine dependence while patients stay in an inpatient setting

System:

- Inpatient treatment settings are typically ‘smoke-free’, providing a supportive environment for cessation (enabler).[74]

Provider:

- Behavioural support can be proactively initiated during inpatient stay by healthcare staff, by dedicated tobacco smoking cessation practitioners (enabler)[50, 64, 71]
- Intensive support provision should be considered to increase uptake of and adherence to pharmacotherapy and nicotine replacement therapy (enabler)[74, 75]
- NRT and pharmacotherapy can be readily provided during an inpatient stay[75, 77], provided free or low cost and paired with brief advice (enabler)[68]
- Pharmacists are a regular point of contact in some inpatient settings who can facilitate NRT access in treatment and at discharge (enabler)[55]
- Providers can demonstrate how pharmacotherapy can alleviate nicotine withdrawal symptoms and link this to post-discharge interventions (enabler).[37]

Patient:

- Logistical challenges of inpatient stays, such as service and treatment schedules, can disrupt patients' ability to engage with tobacco cessation counsellors (barrier)[77]
- Interventions delivering group counselling can have low patient appeal, limiting sustained engagement (barrier) (mental health service consumers).[68]

b) Support tobacco smoking and e-cigarette cessation

System:

- Economic evaluation has indicated that no one type of behavioural intervention for tobacco smoking cessation was more cost-effective (enabler)[15]
- Tobacco cessation interventions do not impede substance-dependence treatment success[7, 36, 56], though additional tobacco cessation support is needed (enabler) (patients who use AOD)[62]
- Capitalising on existing infrastructure and staffing (e.g. pharmacists[55]) to deliver cessation supports can improve intervention implementation and feasibility and reduce impact on clinical workflow (enabler)[53, 58]
- Counselling and quitline referral interventions are readily embedded in hospital systems (enabler)[70]
- Counselling support can be combined with proactive automated resources such as interactive voice response to improve cessation outcomes, and can support patient follow-up (enabler) (mental health service consumers)[40]
- Primary healthcare systems can benefit patients by linking to follow-up tobacco cessation supports at discharge (enabler).[75]

Provider:

- Patient contact and residential details may be outdated/inaccurate, limiting contact and pharmacotherapy supply at discharge (barrier)[47]
- Offering more intensive counselling support (i.e. time) increases the cost per person quitting (barrier)[70]
- Patients are more likely to connect with tobacco cessation counsellors at intake (enabler)[77]
- Tobacco cessation support can be opportunistically embedded into routine service provision (enabler) (patients who use AOD)[54]

- Brief booster sessions, following initial cessation advice can increase the likelihood of using NRT (enabler).[68]

Patient:

- Pharmacotherapy treatment adherence can be as low as 50% (e.g. NRT, varenicline, bupropion) (barrier)[46, 69, 72]
- Additional support for pharmacotherapy adherence is needed for pregnant women (enabler)[46, 63]
- Abrupt tobacco cessation interventions can better support tobacco smoking cessation than gradual interventions (enabler)[60]
- Varenicline is a safe tobacco cessation option for people being treated for alcohol dependence (enabler) (patients who use AOD).[80]

Gaps in the evidence

We noted the following gaps in the evidence:

- **Management of nicotine dependence in acute inpatient settings:** No identified studies addressed outcomes related to: not smoking in healthcare setting grounds, tobacco abstinence during stay and self-directed discharge. However, most acute inpatient healthcare settings are smoke-free and have policies to support abstinence during stays. Thus, we do not believe this is a gap in the evidence, but rather a reflection of no change in accepted current best practice to manage nicotine dependence during inpatient stay.

- **Cessation strategies for young people 12–18 years:** Appendix—Q1 for young people 12–18 years: we found no primary studies addressing nicotine dependence management and tobacco cessation in healthcare settings for youth aged under 18 years. One Cochrane review of Level II studies focused on tobacco cessation interventions for people under the age of 20 years; however, it was not limited to the healthcare setting context. The Cochrane review concluded there was insufficient evidence to determine the benefits of primary care interventions for tobacco cessation among youth who smoked. More research in this area is required.

- **E-cigarette dependence and cessation:** None of the studies captured in the Evidence Check explicitly addressed e-cigarette nicotine dependence or e-cigarette cessation, as this is a relatively new area of research in relation to healthcare settings. RCTs focusing on e-cigarette dependence and cessation are needed.

- **Special interest population groups:** A number of studies addressed the efficacy and safety of pharmacotherapy for tobacco cessation (e.g. varenicline, bupropion), though there was a lack of evidence addressing this across the range of identified priority populations (e.g. mental health service consumers).

- **Aboriginal and Torres Strait Islander peoples:** No studies among Aboriginal and Torres Strait Islander people met Evidence Check inclusion criteria (i.e. level of evidence L-I or LII). Lower-level evidence studies do offer evidence, though this is typically highly context- and population-specific. RCTs are generally not considered culturally appropriate for this group.

- **Dual users:** We found no evidence regarding complete cessation from both products (i.e. tobacco cigarettes and e-cigarettes) among *dual users*. Refer to the point above regarding a lack of studies addressing e-cigarette dependence and cessation.

- **Barriers and enablers related to implementation of interventions:** As the studies identified in the Evidence Check had primary outcomes of effectiveness, few provided substantive information on barriers and enablers to implementation of interventions in healthcare settings. We recommend that a search be conducted for descriptive studies, qualitative studies or process

evaluations that assess service staff and patient experiences related to interventions to adequately understand the barriers and enablers of implementation of cessation interventions in these settings.

Implications of the findings

Evidence continues to support the recommendation of a ***multi-component approach providing both pharmacotherapy and behavioural interventions*** as best practice for supporting tobacco smoking cessation.

Management of nicotine dependence during inpatient stays

- Provision of brief behavioural support and offer of pharmacotherapy for duration of stay continues to be the accepted standard of care for management of nicotine dependent patients during an inpatient stay at acute inpatient healthcare settings
- Research is now focused on optimising provision of care to increase intervention uptake and maintain cessation post discharge
- Direct or assisted connection to quitline should be included in behavioural interventions during an inpatient stay
- Designated healthcare staff role to assist in obtaining pharmacotherapy during stay (and on discharge) increases uptake and use. This role can be undertaken by a variety of disciplines (e.g. pharmacist, nurse)
- Connecting patients to continuing behavioural support post discharge, and providing additional pharmacotherapy on discharge (or at minimum discharging with prescription) is required to maintain cessation.

Supporting tobacco smoking and e-cigarette cessation among nicotine dependent patients

- Varenicline should be offered to all inpatients who do not have contraindications for its use, and combined with behavioural support, with both varenicline and behavioural support being continued (after discharge if inpatient) for a full 12 weeks. For those for whom varenicline is contraindicated, cNRT with counselling support should be offered, again continuing post-discharge
- A range of tobacco smoking cessation medications (NRT, varenicline, bupropion, etc.) is available and people may have tried various combinations of these. People should be encouraged to try these and use those they prefer, with encouragement to sustain the use of pharmacotherapies for as long as is necessary to prevent a return to smoking tobacco
- Quitlines can provide proactive behavioural support in inpatient settings as well as in the community.

E-cigarette dependence and cessation

- In light of no available evidence to guide management of e-cigarette dependence and cessation, it is recommended that patients seeking to quit e-cigarettes be treated with the same approach to nicotine dependence as outlined for tobacco smoking.

Special interest population groups

- Tobacco smoking rates are very high among priority populations
- Although quit rates reported in studies are not high, people are generally motivated to quit and may require numerous quit attempts before finally succeeding. Ongoing non-judgemental support for quitting tobacco smoking should be provided, with tobacco smoking raised about every six months if the person has not made a recent quit attempt
- Ceasing tobacco use does not appear to worsen mental health or AOD use and may be associated with improvement in these domains
- Combination behavioural and pharmacotherapy interventions, probably extended over longer time periods, are likely to be of most benefit
- Consideration should be given to the likelihood that some people from the identified special interest population groups who smoke will not quit and long-term use of nicotine will be required.

Barriers and enablers

- An alternative search strategy is recommended to adequately evaluate the enablers and barriers to implementation of brief clinical interventions in healthcare settings to manage nicotine dependence and support tobacco smoking cessation (particularly among priority groups)
- From limited data enablers include a smoke-free setting, accessible referral and prescription pathways, subsidised care, and involvement of variety of healthcare staff. Barriers include logistical challenges as patients move through the system and cost in terms of both budget and healthcare staff time.

Appendices

Appendix 1—Question 1 (12–18 years old)

What are the most effective clinical interventions that clinicians can provide in healthcare settings to nicotine dependent patients from 12–18 years of age to a) manage their nicotine dependence while they stay in an inpatient setting; and b) support smoking and e-cigarette cessation?

We found only one Cochrane systematic review[1] in the database search conducted for this Evidence Check that reported on tobacco smoking cessation interventions for young people under the age of 18 years. We also conducted a grey literature search to find additional studies relevant to the age group, retrieving 14 studies[2–15]; we also screened their reference lists for additional articles. A summary of relevant studies is provided below with the major recommendations as reported by the authors and our impression of the strength of those recommendations.

The Cochrane review[1] evaluated the effectiveness of strategies to help young people under the age of 20 years to stop tobacco smoking and included 41 studies—26 individually randomised and 15 cluster randomised trials. Multiple interventions were evaluated in the review: individual counselling, group counselling, computer-based interventions, text messaging-based interventions, interventions with multiple delivery methods and pharmacological interventions. The pharmacological interventions tested were NRT, bupropion and nicotine patch plus bupropion vs. nicotine patch plus placebo. Only group counselling vs. control showed moderate evidence of effectiveness RR 1.35 (1.03–1.77); outcome was confirmed by biochemical validation and self-report. Included RCTs had high or unclear risk of bias in at least one domain and therefore these results should be interpreted with caution.

A review of evidence as to the benefits and harms of primary care interventions for the cessation of tobacco use among children and adolescents below the age of 18 was conducted by the US Preventive Services Task Force (USPSTF).[2] The recommendations were based on publications dated 1996–2015. It found there was insufficient evidence as to the harms or benefits of any intervention for tobacco smoking cessation in young people.

A guideline recommended that NRT, bupropion and varenicline can be used for young people under clinical supervision.[7] It recommended healthcare staff consider nicotine dependence, motivation to quit, willingness to accept counselling and body weight when using NRT for adolescents aged 12 and over. This recommendation, however, was based on another guideline published in 2000 rather than primary research.

Another identified guideline[9] based its recommendations on the Cochrane systematic review.

A guideline that recommended NRT may be considered as a supportive therapy for tobacco smoking cessation during hospital admission of young people, did not clearly provide the evidence source on which it was based.[10]

Characteristics of evidence

A systematic review with meta-analysis that included 41 RCTs with 13,292 participants below the age of 20 years.[1]

A review of literature including 13 studies.[2]

Three evidence-based guidelines.[7, 9, 10]

Recommendations

- There is moderate evidence that group-based behavioural interventions may be helpful in tobacco smoking cessation among individuals less than 20 years of age
- There is insufficient evidence as to the effectiveness of individual counselling for tobacco smoking cessation for individuals younger than 20 years of age
- There is insufficient evidence to assess the benefits and harms of interventions feasible in primary care for cessation of tobacco use among school-aged children and adolescents
- There is not enough evidence to support the use of NRT for tobacco smoking cessation among 12–18 year-old individuals
- There is insufficient evidence as to the safety and efficacy of bupropion and other pharmacological interventions for individuals under 18 years of age
- There is moderate evidence that group-based behavioural interventions may be helpful in tobacco smoking cessation among individuals less than 20 years of age

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Appendix 2—Search strategy

Table A 2.1—Search strategies for each database

Database	Search terms – smoking	Search terms e-cigarette
MEDLINE	1 (tobacco or smok* or nicotine or cigar* or cigar or shisha or hooka).ti,ab. 2 *Smoking/ or *Tobacco/ or *Tobacco, Smokeless/ or *Tobacco Smoking/ or *"Tobacco Use"/ or *Tobacco, Waterpipe/ or *"Tobacco Use Cessation"/ or *Nicotinic Agonists/ or *Smoking Cessation/mt or *Smoking Prevention/mt 3 *Risk Reduction Behavior/ or ("nicotine dependence" or "nicotine withdrawal" or "nicotine addiction" or cessation or quit or abstain or stop or cease or "give up" or abstinen* or deter or reduc* or decrease or delay or less or fewer or prevalence or "point prevalence abstinence" or manag* or "harm reduction" or "harm minimi#ation" or switching or substitution or "quit rate" or uptake or "withdrawal symptoms" or smokefree or "smoke free" or "vape free" or restriction or areas or non-smoking or acceptability or "biochemical verification" or "carbon monoxide" or cotinine).mp. 4 1 or 2 5 3 and 4 6 (alcohol or "other drug" or clinic or clinical or "clinical setting" or	1 ("e cigarette*" or e-cigarette* or "electronic cigarette" or e-cig or vaping or vape or "vapourised nicotine product" or "nicotine vaping product" or e-hookah or vape pen or heat-not-burn or IQOS or "alternative nicotine products").ti,ab. 2 *Electronic Nicotine Delivery Systems/ or *Vaping/ 3 1 or 2 4 ((vaping adj2 (cessation or abstinence or quit)) or (manage adj addiction) or abstain or quit or abstain or stop or cease or "give up" or abstinen* or deter or reduc* or decrease or delay or less or fewer or prevalence or manag* or "harm reduction" or "harm minimi#ation" or switching or substitution or "quit rate" or uptake or "withdrawal symptoms" or smokefree or "smoke free" or "vape free" or restriction or areas or non-smoking or acceptability or "biochemical verification" or "carbon monoxide" or cotinine).tw. 5 *Substance Withdrawal Syndrome/th or *Nicotine Agonists/ad 6 4 or 5

Database	Search terms – smoking	Search terms e-cigarette
	outpatient or inpatient or hospital or community-based or "community care" or primary care or healthcare or "health care" or pharmac* or dentist* or dental or oral or "eye care" or optol* or optom* or "family care" or pregnan* or maternal or prenatal or "emergency department" or withdrawal or detox* or oncology or psychiatric or "drug treatment center" or AOD or rehabilitation or "sobering up" or service).mp. 7 (intervention* or treatment* or therap* or program or "behavioural intervention" or "brief advice" or "clinical intervention" or "motivational interviewing" or CBT or "cognitive behavioural therapy" or counselling or psychotherapy or "contingency management" or "financial incentives" or "social support" or quitline or hotline or "nicotine replacement therapy" or NRT or "addiction" or bupropion or varenicline or cytisine or zyban or champix or chantix).tw. 8 5 and 6 and 7 9 "randomized controlled trial" or RCT or "randomized trial" or trial or "controlled trial" or "systematic review" or "clinical trial" or "cluster randomized" or "program evaluation").tw. 10 8 and 9 11 limit 10 to yr="2013 -Current" 12 ("mental health" or "mental illness" or "psychiatric patients" or "substance abuse" or "substance misuse" or "substance use" or drug or alcohol or cannabis or methamphetamine or cocaine or heroin or methadone or opioid or opiate or "First Nations" or	7 ((alcohol adj2 "other drug") or clinic or clinical or "clinical setting" or outpatient or (inpatient adj2 hospital) or community-based or "community care" or primary care or healthcare or "health care" or pharmac* or dentist* or dental or oral or "eye care" or opthol* or optom* or "family care" or pregnan* or maternal or prenatal or "emergency department" or withdrawal or detox* or oncology or psychiatric or "drug treatment center" or AOD or rehabilitation or "sobering up" or service).tw. 8 (intervention* or treatment* or therap* or program or "behavioural intervention" or "brief advice" or "clinical intervention" or "motivational interviewing" or CBT or "cognitive behavioural therapy" or counselling or psychotherapy or "contingency management" or "financial incentives" or "social support" or quitline or hotline or "nicotine replacement therapy" or NRT or "addiction treatment" or bupropion or varenicline or cytisine or zyban or champix or chantix).mp. 9 7 and 8 10 ("mental health" or "mental illness" or "psychiatric patients" or "substance abuse" or "substance misuse" or "substance use" or drug or alcohol or cannabis or methamphetamine or cocaine or heroin or methadone or opioid or opiate or "First Nations" or indigenous or Aboriginal or "Torres

Database	Search terms – smoking	Search terms e-cigarette
	indigenous or Aboriginal or "Torres Strait Islander" or pregnan* or matern*).tw. 13 10 and 12 14 limit 13 to yr="2013 -Current"	Strait Islander" or pregnan* or matern*).tw. 11 3 and 6 and 9 12 limit 11 to yr="2013 - Current" 13 10 and 12
CINAHL	S1 ((TI tobacco OR AB tobacco) OR (TI smok* OR AB smok*) OR (TI nicotine OR AB nicotine) OR (TI cigar* OR AB cigar*) OR (TI cigar ORAB cigar) OR (TI shisha OR AB shisha) OR (TI hooka OR AB hooka)) S2 (MH Smoking) OR (MH Tobacco) OR (MH "Tobacco, Smokeless")OR (MH "Tobacco Smoking") OR (MH "Tobacco Use") OR (MH "Tobacco Use Cessation Products") OR (MH "Nicotinic Agonists") OR(MH "Smoking Cessation") S3 (MH "Tobacco Use Cessation Products") OR(MH "Risk Control: Tobacco Use (Iowa NOC)") OR (MH "Substance Abstinence")OR (MH "Tobacco Abuse Control (Saba CCC)") S4 ("nicotine dependence "OR "nicotine withdrawal" OR "nicotine addiction" OR cessation OR quit OR abstain OR stop OR cease OR "give up" OR abstinen* OR deter OR reduc* OR decrease OR delay OR less OR fewer OR prevalence OR "point prevalence abstinence" OR manag* OR "harm reduction" OR "harm minimi?ation" OR switching OR substitution OR "quit rate" OR uptake OR "withdrawal symptoms" OR smokefree OR "smokefree" OR "vape free" OR restriction OR areas OR non-smoking OR acceptability OR	S1 ((TI "e cigarette*" OR AB "e cigarette*") OR (TI e- cigarette* OR AB e- cigarette*) OR (TI "electronic cigarette" OR AB "electronic cigarette") OR (TI e-cig OR AB e- cig) OR (TI vaping OR AB vaping) OR (TI vape OR AB vape) OR (TI "vapourised nicotine product" OR AB "vapourised nicotine product") OR (TI "nicotine vaping product" OR AB "nicotine vaping product") OR (TI e- hookah OR AB e-hookah) OR (TI "vape pen" OR AB "vape pen") OR (TI heat-not-burn OR AB heat-not-burn) OR (TI IQOS OR AB IQOS) OR (TI "alternative nicotine products" OR AB "alternative nicotine products")) S2 (MM "Vaping") S3 S1 OR S2 S4 (((TI vaping OR Abv aping) N2 ((TI cessation OR AB cessation) OR (TI abstinence OR AB abstinence) OR (TI quit OR AB quit))) OR ((TI manage OR AB manage)W1 (TI addiction OR AB addiction)) OR (TI abstain OR AB abstain)OR (TI quit OR AB quit)OR

Database	Search terms – smoking	Search terms e-cigarette
	"biochemical verification" OR "carbon monoxide" OR cotinine) S5 S1 OR S2 S6 S3 OR S4 S7 S5 AND S6 S8 (alcohol OR "other drug" OR clinic OR clinical OR "clinical setting" OR outpatient OR inpatient OR hospital OR community-based OR "community care" OR "primary care" OR healthcare OR "health care" OR pharmac* OR dentist* OR dental OR oral OR "eye care" OR optol* OR optom* OR "family care" OR pregnan* OR maternal OR prenatal OR "emergency department" OR withdrawal OR detox* OR oncology OR psychiatric OR "drug treatment center" OR AOD OR rehabilitation OR "sobering up" OR service) ((TI intervention* OR AB intervention*) OR (TI treatment* OR AB treatment*) OR (TI therap* OR AB therap*) OR (TI program OR AB program) OR (TI "behavioural intervention" OR AB "behavioural intervention") OR (TI "brief advice" OR AB "brief advice") OR (TI "clinical intervention" OR AB "clinical intervention") OR (TI "motivational interviewing" OR AB "motivational interviewing") OR (TI CBT OR AB CBT) OR (TI "cognitive behavioural therapy" OR AB "cognitive behavioural therapy") OR (TI counselling OR AB counselling) OR (TI psychotherapy OR AB psychotherapy) OR (TI "contingency management" OR AB "contingency management") OR (TI	(TI abstain OR AB abstain) OR (TI stop OR AB stop) OR (TI cease OR AB cease) OR (TI "give up" OR AB "give up") OR (TI abstinen* OR AB abstinen*) OR (TI deter OR AB deter) OR (TI reduc* OR AB reduc*) OR (TI decrease OR AB decrease) OR (TI delay OR AB delay) OR (TI less OR AB less) OR (TI fewer OR AB fewer) OR (TI prevalence OR AB prevalence) OR (TI manag* OR AB manag*) OR (TI "harm reduction" OR AB "harm reduction") OR (TI "harm minimi? ation" OR AB "harm minimi?ation") OR (TI switching OR AB switching) OR (TI substitution OR AB substitution) OR (TI "quit rate" OR AB "quit rate") OR (TI uptake OR AB uptake) OR (TI "withdrawal symptoms" OR AB "withdrawal symptoms") OR (TI smokefree OR AB smokefree) OR (TI "smoke free" OR AB "smoke free") OR (TI "vape free" OR AB "vape free") OR (TI restriction OR AB restriction) OR (TI areas OR AB areas) OR (TI non-smoking OR AB non-smoking) OR (TI acceptability OR AB acceptability) OR (TI "biochemical verification" OR AB "biochemical

Database	Search terms – smoking	Search terms e-cigarette
	"financial incentives" OR AB "financial incentives") OR (TI "social support" OR AB "social support") OR (TI quitline OR AB quitline) OR (TI hotline OR AB hotline) OR (TI "nicotine replacement therapy" OR AB "nicotine replacement therapy") OR (TI NRT OR AB NRT) OR (TI addiction OR AB addiction) OR (TI bupropion OR AB bupropion) OR (TI varenicline OR AB varenicline) OR (TI cytisine OR AB cytisine) OR (TI zyban OR AB zyban) OR (TI champix OR AB champix) OR (TI chantix OR AB chantix)) S9 S7 AND S8 S10 ((TI "randomized controlled trial" OR AB "randomized controlled trial") OR (TI RCT OR AB RCT) OR (TI "randomized trial" OR AB "randomized trial") OR (TI trial OR AB trial) OR (TI "controlled trial" OR AB "controlled trial") OR (TI "systematic review" OR AB "systematic review") OR (TI "clinical trial" OR AB "clinical trial") OR (TI "cluster randomized" OR AB "cluster randomized") OR (TI "program evaluation" OR AB "program evaluation")) S11 S9 AND S10 S12 S9 AND S10 S13 ((TI "mental health" ORAB "mental health") OR(TI "mental illness" ORAB "mental illness") OR(TI "psychiatric patients" OR AB "psychiatric patients") OR (TI "substance abuse" ORAB "substance abuse")OR (TI "substance misuse" OR AB "substance misuse") OR(TI "substance use" ORAB	verification") OR (TI "carbon monoxide" OR AB "carbon monoxide") OR (TI cotinine OR AB cotinine)) (MH "Substance Withdrawal Syndrome") OR (MH "Nicotine Agonists") S5 S3 OR S4 S6 (((TI alcohol OR AB alcohol) N2 (TI "other drug" OR AB "other drug")) OR (TI clinic OR AB clinic) OR (TI clinical OR AB clinical) OR (TI "clinical setting" OR AB "clinical setting") OR (TI outpatient OR AB outpatient) OR ((TI inpatient OR AB inpatient) N2 (TI hospital OR AB hospital)) OR (TI community-based OR AB community-based) OR (TI "community care" OR AB "community care") OR (TI "primary care" OR AB "primary care") OR (TI healthcare OR AB healthcare) OR (TI "health care" OR AB "health care") OR (TI pharmac* OR AB pharmac*) OR (TI dentist* OR AB dentist*) OR (TI dental OR AB dental) OR (TI oral OR AB oral) OR (TI "eye care" OR AB "eye care") OR (TI opthol* OR AB opthol*) OR (TI optom* OR AB optom*) OR (TI "family care" OR AB "family care") OR (TI pregnan* OR AB pregnan*) OR (TI maternal OR AB maternal)

Database	Search terms – smoking	Search terms e-cigarette
	"substance use") OR(TI drug OR AB drug) OR(TI alcohol OR AB alcohol) OR (TI cannabis OR AB cannabis) OR (TI methamphetamine OR AB methamphetamine)OR (TI cocaine OR AB cocaine) OR (TI heroin OR AB heroin) OR (TI methadone OR AB methadone) OR (TI opioid OR AB opioid) OR(TI opiate OR AB opiate)OR (TI "First Nations" OR AB "First Nations")OR (TI indigenous ORAB indigenous) OR (TI Aboriginal OR AB Aboriginal) OR (TI "Torres Strait Islander"OR AB "Torres StraitIslander") OR (TI pregnan* OR AB pregnan*) OR (TI matern* OR AB matern*)) S14 S12 AND S13 Limiters - Published Date: 20130101-20231231	OR (TI prenatal OR AB prenatal) OR (TI "emergency department" OR AB "emergency department") OR (TI withdrawal OR AB withdrawal) OR (TI detox* OR AB detox*) OR (TI oncology OR AB oncology) OR (TI psychiatric OR AB psychiatric) OR (TI "drug treatment center" OR AB "drug treatment center") OR (TI AOD OR AB AOD) OR (TI rehabilitation OR AB rehabilitation) OR (TI "sobering up" OR AB "sobering up") OR (TI service OR AB service)) S7 (intervention* OR treatment* OR therap* OR program OR "behavioural intervention" OR "brief advice" OR "clinical intervention" OR "motivational interviewing" OR CBT OR "cognitive behavioural therapy" OR counselling OR psychotherapy OR "contingency management" OR "financial incentives" OR "social support" OR quitline OR hotline OR "nicotine replacement therapy" OR NRT OR "addiction treatment" OR bupropion OR varenicline OR cytisine OR zyban OR champix OR chantix) S8 S6 AND S7 S9 ((TI "mental health" ORAB "mental health") OR(TI "mental

Database	Search terms – smoking	Search terms e-cigarette
		illness" ORAB "mental illness") OR(TI "psychiatric patients" OR AB "psychiatric patients") OR (TI "substance abuse" ORAB "substance abuse")OR (TI "substance misuse" OR AB "substance misuse") OR(TI "substance use" ORAB "substance use") OR(TI drug OR AB drug) OR(TI alcohol OR AB alcohol) OR (TI cannabis OR AB cannabis) OR (TI methamphetamine OR AB methamphetamine)OR (TI cocaine OR AB cocaine) OR (TI heroin OR AB heroin) OR (TI methadone OR AB methadone) OR (TI opioid OR AB opioid) OR(TI opiate OR AB opiate)OR (TI "First Nations" OR AB "First Nations")OR (TI indigenous ORAB indigenous) OR (TI Aboriginal OR AB Aboriginal) OR (TI "Torres Strait Islander" OR AB "Torres Strait Islander") OR (TI pregnan* OR AB pregnan*) OR (TI matern* OR AB matern*)) S10 S3 AND S5 AND S8 S11 S9 AND S10 S12 S9 AND S10 Limiters - Published Date: 20130101-20231231 S13 S3 AND S5 AND S8
Scopus	((TITLE-ABS-KEY ((alcohol W/2 "other drug") OR clinic OR clinical OR "clinical setting" OR outpatient OR inpatient OR hospital OR community-based OR "community care" OR	((TITLE-ABS ("mental health" OR "mental illness" OR "psychiatric patients" OR "substance abuse" OR "substance misuse" OR

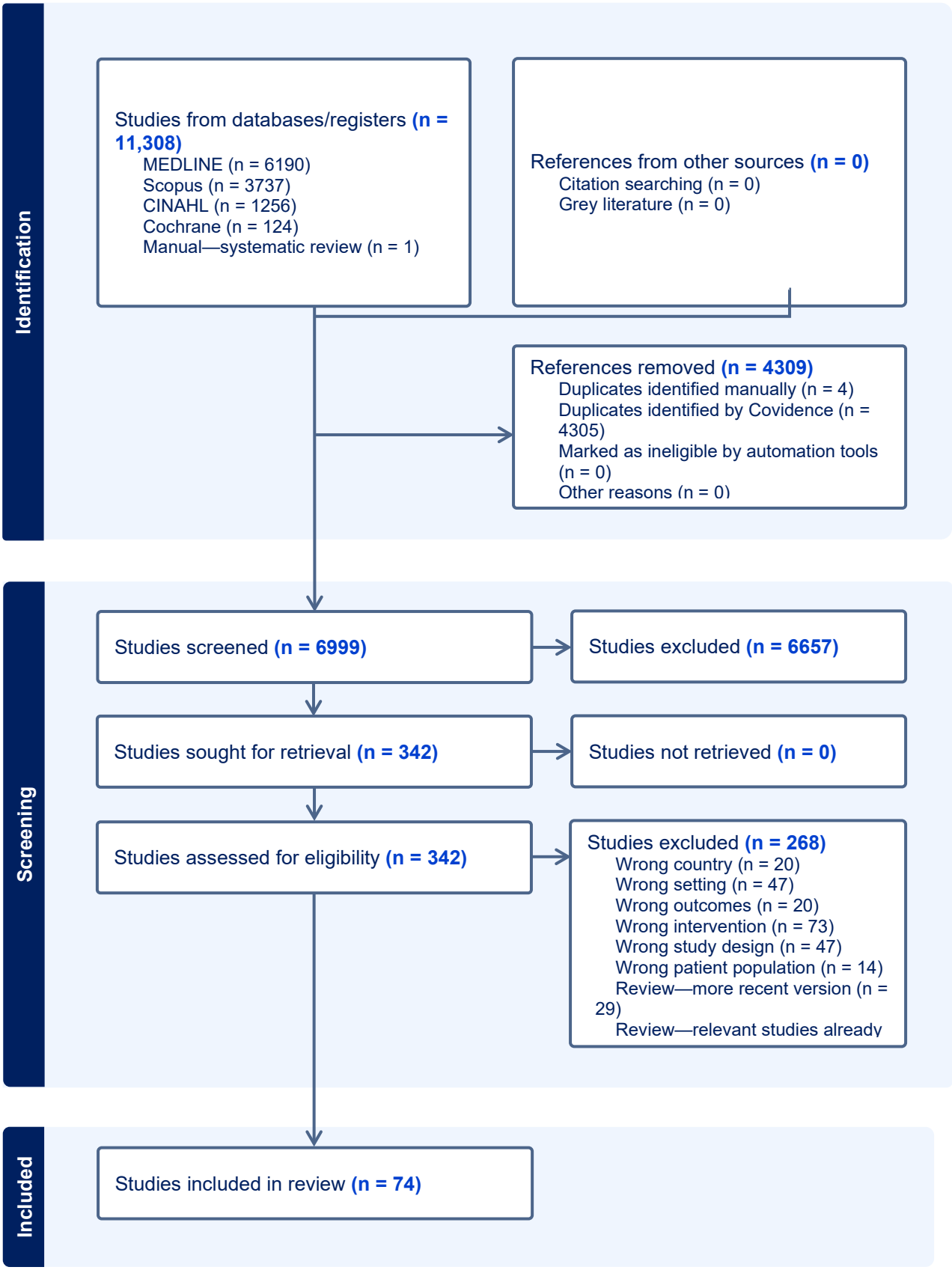
Database	Search terms – smoking	Search terms e-cigarette
	"primary care" OR healthcare OR "health care" OR pharmac* OR dentist* OR dental OR oral OR "eye care" OR optol* OR optom* OR "family care" OR pregnan* OR maternal OR prenatal OR "emergency department" OR withdrawal OR detox* OR oncology OR psychiatric OR "drug treatment center" OR aod OR rehabilitation OR "sobering up")) AND (TITLE-ABS (intervention* OR treatment* OR therap* OR program OR "behavioural intervention" OR "brief advice" OR "clinical intervention" OR "motivational interviewing" OR cbt OR "cognitive behavioural therapy" OR counselling OR psychotherapy OR "contingency management" OR "financial incentives" OR "social support" OR quitline OR hotline OR "nicotine replacement therapy" OR nrt OR addiction OR bupropion OR varenicline OR cytisine OR zyban OR champix OR chantix) W/5 (smoking OR tobacco OR nicotine))) AND (TITLE-ABS ("randomized controlled trial" OR rct OR "randomized trial" OR trial OR "controlled trial" OR "systematic review" OR "clinical trial" OR "cluster randomized" OR "program evaluation")) AND (LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2023)) AND (LIMIT-TO (AFFILCOUNTRY , "United States") OR LIMIT-TO (AFFILCOUNTRY ,	"substance use" OR drug OR alcohol OR cannabis OR methamphetamine OR cocaine OR heroin OR methadone OR opioid OR opiate OR "First Nations" OR indigenous OR aboriginal OR "Torres Strait Islander" OR pregnan* OR matern*))) AND ((TITLE-ABS ((alcohol W/2 "other drug") OR clinic OR clinical OR "clinical setting" OR outpatient OR (inpatient W/2 hospital) OR community-based OR "community care" OR "primary care" OR healthcare OR "health care" OR pharmac* OR dentist* OR dental OR oral OR "eye care" OR opthol* OR optom* OR "family care" OR pregnan* OR maternal OR prenatal OR "emergency department" OR withdrawal OR detox* OR oncology OR psychiatric OR "drug treatment center" OR aod OR rehabilitation OR "sobering up" OR service)) AND (TITLE-ABS-KEY (intervention* OR treatment* OR therap* OR program OR "behavioural intervention" OR "brief advice" OR "clinical intervention" OR "motivational interviewing" OR cbt OR "cognitive behavioural therapy" OR counselling OR psychotherapy OR "contingency management" OR "financial incentives" OR "social support" OR quitline OR hotline OR "nicotine replacement therapy" OR nrt OR "addiction treatment" OR bupropion OR varenicline OR cytisine OR zyban OR champix

Database	Search terms – smoking	Search terms e-cigarette
	"United Kingdom") OR LIMIT-TO (AFFILCOUNTRY , "Australia") OR LIMIT-TO (AFFILCOUNTRY , "Canada") OR LIMIT-TO (AFFILCOUNTRY , "New Zealand")) AND (LIMIT-TO (EXACTKEYWORD , "Humans")) AND (LIMIT-TO (LANGUAGE , "English")) AND (EXCLUDE (DOCTYPE , "ch") OR EXCLUDE (DOCTYPE , "le") OR EXCLUDE (DOCTYPE , "no") OR EXCLUDE (DOCTYPE , "cp")) AND (EXCLUDE (SUBJAREA , "ARTS") OR EXCLUDE (SUBJAREA , "AGRI") OR EXCLUDE (SUBJAREA , "ECON") OR EXCLUDE (SUBJAREA , "ENGI") OR EXCLUDE (SUBJAREA , "BUSI") OR EXCLUDE (SUBJAREA , "PHYS") OR EXCLUDE (SUBJAREA , "MATH") OR EXCLUDE (SUBJAREA , "MATE") OR EXCLUDE (SUBJAREA , "COMP") OR EXCLUDE (SUBJAREA , "IMMU") OR EXCLUDE (SUBJAREA , "ENVI") OR EXCLUDE (SUBJAREA , "BIOC") OR EXCLUDE (SUBJAREA , "SOCI"))	OR chantix))) AND ((TITLE-ABS ((vaping W/2 (cessation OR abstinence OR quit)) OR (manage W/1 addiction) OR abstain OR quit OR abstain OR stop OR cease OR "give up" OR abstinen* OR deter OR reduc* OR decrease OR delay OR less OR fewer OR prevalence OR manag* OR "harm reduction" OR "harm minimi?ation" OR switching OR substitution OR "quit rate" OR uptake OR "withdrawal symptoms" OR smokefree OR "smoke free" OR "vape free" OR restriction OR areas OR non-smoking OR acceptability OR "biochemical verification" OR "carbon monoxide" OR cotinine)) OR (INDEXTERMS ("Substance Withdrawal Syndrome") OR INDEXTERMS ("Nicotine Agonists"))) AND ((TITLE-ABS ("e cigarette*" OR e-cigarette* OR "electronic cigarette" OR e-cig OR vaping OR vape OR "vapourised nicotine product" OR "nicotine vaping product" OR e-hookah OR "vape pen" OR heat-not-burn OR iqos OR "alternative nicotine products")))
Cochrane	Tobacco OR smok* OR nicotine OR cigar* OR cigar OR shisha OR hooka OR waterpipe in Title Abstract Keyword AND "nicotine dependence" OR "nicotine withdrawal" OR "nicotine addiction" OR cessation OR quit OR abstain OR stop OR cease OR "give up" OR abstinen* OR deter OR reduc*	"Electronic Nicotine Delivery" OR e cigarette* OR e-cigarette* OR electronic cigarette OR e-cig OR vaping OR vape OR "vapourised nicotine product" OR "nicotine vaping product" OR e-hookahs OR "vape pens" OR heat-not-burn OR IQOS OR "alternative nicotine

Database	Search terms – smoking	Search terms e-cigarette
	OR decrease OR delay OR less OR fewer OR prevalence OR "point prevalence abstinence" OR manag* OR "harm reduction" OR "harm minimi?ation" OR switching OR substitution OR "quit rate" OR uptake OR "withdrawal symptoms" OR smokefree OR "smoke free" OR "vape free" OR restriction OR areas OR non-smoking OR acceptability OR "biochemical verification" OR "carbon monoxide" OR cotinine in Title Abstract Keyword AND intervention* OR treatment* OR therap* OR program OR "behavioural intervention" OR "brief advice" OR "clinical intervention" OR "motivational interviewing" OR CBT or "cognitive behavioural therapy" OR counselling OR psychotherapy OR "contingency management" OR "financial incentives" OR social support OR quitline OR hotline OR "nicotine replacement therapy" OR NRT OR pharmacological OR bupropion OR varenicline OR cytisine OR zyban OR champix OR chantix in Title Abstract Keyword AND randomi#ed controlled trial OR RCT OR randomi#ed trial OR trial OR controlled trial OR systematic review OR clinical trial in Title Abstract Keyword AND First Nations OR indigenous OR Aboriginal OR "Torres Strait Islander" OR pregnan* OR matern* OR "mental health" OR "psychiatric patients" OR "substance abuse" OR "substance misuse" OR drug OR alcohol OR cannabis OR methamphetamine OR cocaine OR heroin OR methadone OR opioid OR opiate OR dual use OR "dual users" OR concurrent use* in Title Abstract Keyword - (Word variations have been searched)	products" in Title Abstract Keyword AND clinic OR clinical OR "clinical setting" OR outpatient OR inpatient OR hospital OR community-based OR "community care" OR "primary care" OR healthcare OR "health care" OR pharmac* OR dentist* OR dental OR oral OR "eye care" OR optol* OR optom* OR "family care" OR pregnan* OR matern*al OR prenatal OR "aged care" OR residential OR rehabilitation OR "emergency department" OR withdrawal OR detox* OR psychiatric in Title Abstract Keyword AND intervention* OR treatment* OR therap* OR program OR behavioural intervention OR brief advice OR clinical intervention OR motivational interviewing OR CBT or cognitive behavioural therapy OR counselling OR psychotherapy OR contingency management OR financial incentives OR social support OR quitline OR hotline OR nicotine replacement therapy OR NRT OR pharmacological OR bupropion OR varenicline OR cytisine OR zyban OR champix OR chantix in Title Abstract Keyword AND quit OR stop OR cease OR give OR abstain* OR abstinen* OR cessation OR deter OR reduc* OR decrease OR delay OR less OR fewer OR prevalence OR point prevalence OR harm reduction OR harm minimisation OR switching OR substitution OR quit rate OR uptake OR withdrawal OR withdrawal symptoms OR discharge OR smokefree OR smoke free OR vape free OR

Database	Search terms – smoking	Search terms e-cigarette
		restriction OR areas OR non-smoking OR acceptability OR biochemical verification OR carbon monoxide OR cotinine in Title Abstract Keyword AND First Nations OR indigenous OR Aboriginal OR Torres Strait Islander OR pregnan* OR matern* OR mental health OR psychiatric patients OR substance abuse OR substance misuse OR drug OR alcohol OR cannabis OR methamphetamine OR cocaine OR heroin OR methadone OR opioid OR opiate OR dual use OR dual users OR concurrent use* in Title Abstract Keyword (Word variations have been searched)

Appendix 3—PRISMA diagram



Appendix 4—List of studies included in the Evidence Check

Primary studies

1. Gupta D, Winckel K, Burrows J, Ross J, Upham JW. Utilisation of Nicotine Replacement Therapy within a Hospital Pharmacist Initiated Smoking-Cessation Intervention—A Pragmatic Randomised Controlled Trial. J Smok Cessat. 2017;12(1):45–54.
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Note: *Studies that relate to special interest groups

Appendix 5—Table A5.1. Data extraction summary table of primary studies

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Gupta 2017 (Australia)	RCT	Hospital **inpatients** of selected medical wards n=100; 33% female; mean age 49yrs	Evaluate effectiveness of a hospital pharmacist initiated smoking-cessation intervention (SCI) in increasing the use of NRT in hospitalised smokers, and in increasing quit rates post discharge	Pharmacist-initiated smoking cessation **intervention**: patient received brief counselling (10–20mins) by research pharmacist (RP), assisted to obtain NRT on ward and offered referral to quitline. On discharge, RP included request for NRT prescription in patient notes and informed hospital pharmacist to ensure NRT was prescribed on discharge **Control**: (Usual care) ad-hoc smoking assessment by nurse or doctor on admission with offer of NRT. Nicotine patches and gum freely available during stay. On discharge, hospital pharmacist facilitates continuation of any current medications by organising prescriptions from a medical officer	**Abstinent during stay:** Prescribed NRT as inpatient 82% (I) vs 24% (C), x2=33.76, df=1, p=0.0001 **Quit rates:** self-reported 7d PPA at 3 months post-discharge 15% (I) vs 18% (C), x2=0.13, df=1, p=0.72 (OR 0.8, 95%CI 0.24-2.67) **Uptake after brief intervention:** prescribed NRT at discharge 68% (I) vs 12% (C) (X2 = 32.7, df = 1, p < 0.0001)	**Enabler**: hospital pharmacist is patients' main link between wards from admission to discharge **Implications**: hospital pharmacist can effectively deliver smoking cessation support and enhance uptake of pharmacotherapy

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Bernstein 2013 (US)	RCT	**Outpatients** in emergency department n=88, gender statistics not reported, mean age 36.5yrs	To examine the efficacy of a multi-component smoking cessation intervention featuring counselling and pharmacotherapy for adults with concurrent alcohol or drug use visiting a hospital Emergency Department (ED)	**Intervention:** Bilingual peer educator was trained in tobacco dependence treatment and ED-based brief MI interventions. Participants received same brochure as the UC group, plus a 10–15-minute brief MI, and a follow-up telephone call from the interventionist 48–72 hours after the ED visit. Also received 6-week course of nicotine patches (14 days 21 mg, 14 days 14 mg, 14 days 7 mg) **Control:** Usual care: brochure (English/Spanish) on health risks of smoking, with contacts for local cessation programs/quitline, with no additional ED intervention	**Abstinence outcomes:** Biochemically verified (CO/cotinine) 7-day PPA at 3 months, preceding follow-up telephone call, was higher for intervention than usual care participants (14.6% vs 0.0%, p=.02). Biochemically verified (CO/cotinine) 30-day PPA at 3 months, preceding follow-up telephone call, was no different between intervention and usual care participants (8.5%% vs 0.0%, p=.12)	**Implications:** Concurrent alcohol or substance use need not be a barrier to initiation of tobacco-dependence treatment in ED patients, and that SBIRT combined with pharmacotherapy may be efficacious in this highly tobacco-dependent group of individuals **Measures** of tobacco use, including quit attempts made, change in daily cigarette consumption, and use of quitline or other services, did

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
						not differ between intervention groups
Smith 2013 (Australia)	RCT	**Inpatients** of specific medical wards (respiratory, cardiology, neurology and vascular medicine) n=392, gender statistics not reported, mean age 53.25yrs	To evaluate the effectiveness of varenicline tartrate plus quitline counselling compared with Quitline counselling alone when initiated in the inpatient setting	**Intervention:** 12 weeks of varenicline tartrate (titrated from 0.5mg daily to 1mg twice daily) plus quitline counselling **Control:** Quitline counselling	Continuous **abstinence** at 12m (52w): significantly greater in varenicline plus counselling arm compared with counselling alone arm (31.1% vs 21.4%; RR 1.45, 95% CI 1.03 to 2.04, p = 0.03, adjusted p = 0.01) **Other:** Continuous abstinence for w2–26: significantly greater in varenicline plus counselling arm compared with counselling alone arm (39.8% vs 27.6%; RR 1.43,	**Barriers:** Inpatient stays offer patients a bedside phone to ensure initial contact with the quitline counselling service, and an observation period for any medication-related adverse effects **Implications:** Demonstrates effectiveness of varenicline in the inpatient setting "Targeting inpatients during the period of hospital confinement where admissions result

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					95% CI 1.07 to 1.90, p = 0.02, adjusted p = 0.006) Continuous abstinence for w2-12 (end of treatment): significantly greater in varenicline plus counselling arm compared with counselling alone arm (48.5% vs 36.2%; RR 1.32, 95% CI 1.04 to 1.67, p = 0.02, adjusted p = 0.01).	from smoking-related diseases, utilises an opportunity for initiation of best practice treatment"
Eisenberg 2013 (Canada)	RCT	**Inpatients** hospitalized for acute myocardial infarction n=392, gender statics not reported, mean age 53.9yrs	To examine smoking cessation rates among smokers with acute myocardial infarction and to determine whether bupropion, begun in hospital, is safe and can improve	**Intervention:** Bupropion was administered as 150 mg daily for 3 days (first dose in hospital), followed by 150 mg twice daily for remaining 9 weeks of treatment. Behavioural counselling used brief advice (2 mins). Additional 20-min brief advice 5As counselling was received at baseline and at all follow-ups (both telephone and clinic visits). Counselling was	**Abstinence outcome:** CO verified PPA ITT (%): 4 weeks 54.8% (I) Vs 47.0(C) p=0.13; 9 weeks 52.7 (I) vs 45.5 (I) p=0.19;	

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
			cessation rates at 1 year	administered to all patients by the research nurses at baseline and follow-up, and patients could receive supplementary counselling if site had cessation clinic **Control:** Matching placebo administered on same schedule	6 months 38.9 (I) vs 32.8 (C) p=0.24; 12 months 37.2 (I) vs 32 (I) p=0.33 **Continuous abstinence** ITT (%) 4 weeks 54.8 (I) vs 47.0 (C) p=0.13 9 weeks 45.7 (I) vs 40.4 (C) p=0.31 6 months 31.9 (I) vs 25.6 (C) p=0.21 12 months 26.8 (I) vs 22.2 (C) p= 0.34 Mean cigarettes per day **(CPD**) ITT (percentages): At the end of 9 week treatment period, 72.3% (I) versus 82% (C) were taking	

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					1 pill, P = 0.05 (n=230)	
Stapleton 2013 (UK)	RCT	**Community-based** smoking cessation clinics n=1071, 53% female, mean age 41yrs	Assess effectiveness difference between bupropion and nicotine replacement therapy (NRT), whether the combination improves effectiveness and whether either treatment might be more beneficial for certain subgroups of smokers	**Intervention:** Bupropion: 150 mg bupropion for the first 6 days and 300 mg for the remainder of the 8-week course, 7 weekly behavioural support sessions Bupropion + NRT: bupropion as above plus 12-week course of single-product NRT; 7 weekly behavioural support sessions **Control:** NRT: 12-week course of single product NRT, dosage and type adjusted as necessary (patient selected NRT type); 7 weekly behavioural support sessions	**Abstinence outcome:** CO-verified sustained 6-month abstinence rates for bupropion (27.9%) and NRT (24.2%) were not significantly different (odds ratio = 1.21, 95% confidence interval = 0.883–1.67), and the combination rate (24.2%) was similar to that for either treatment alone **Other:** Some evidence that bupropion more beneficial than NRT for those with a history of depression	**Barriers:** High attrition 412/1071 by 2nd follow-up. Significantly poorer level of compliance with bupropion than NRT among those abstinent at 4 months **Implications:** There is some evidence that bupropion is more beneficial than nicotine replacement therapy for smokers with a history of depression

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					(29.8% vs 18.5%, x2=2.86, p=0.091)	Adverse effects: 3 cases of allergic reaction, 2 of which resulted in anaphylaxis and required hospital admission. A fourth participant reported tearfulness and transient suicidal thoughts, one case of severe chest pain No SAEs for NRT Non-serious unwanted symptoms: bupropion— disturbed sleep most common; NRT— nasal irritation (nasal spray) and skin irritation (patch) most common

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Lee 2013 (Canada)	RCT	**Outpatient:** Ambulatory and short-stay surgical hospital n=168, gender statistics not reported, mean age 47.5yrs	To determine whether a pragmatic perioperative smoking cessation intervention designed for a busy preadmission clinic (patients undergoing elective surgery) would be successful in reducing smoking rates and intraoperative and immediate postoperative complications. The secondary objectives were to compare intraoperative and immediate postoperative complication rates, length of stay in the post-anaesthetic care unit (PACU),	**Intervention:** Brief behavioural clinical interventions, e.g. AAH—Ask, Advise, Help—model; 5As model; motivational interviewing; NRT / pharmacotherapy **Control:** Received inconsistent perioperative smoking cessation advice from nurses, surgeons or anaesthesiologists; no further study-specific smoking cessation intervention (were not discouraged from using perioperative smoking cessation aids and could still obtain smoking cessation brochures on request)	Self-reported **abstinence** from smoking for 7d before surgery, combined with exhaled CO of 10 ppm on the day of surgery: significantly more frequent in the intervention group (14.3%) vs control (3.6%; RR = 4.0, 95% CI 1.2-13.7. p = 0.027) **Other:** Inaccurately reported preoperative smoking cessation (self-reported 7d abstinence, with exhaled CO >10 ppm): not significantly different between intervention and control groups (7% vs 6%; RR =	**Barriers:** High refusal rates **Enablers:** Unlike previous more time-consuming studies (which required intensive face-to-face counselling), this study relied on pre-existing infrastructure, including preadmission nurses and the Smokers Helpline, to deliver the information and/or counselling. This should make real-world implementation of the intervention more feasible, with no additional personnel costs,

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
			and 30-day abstinence rates		1.2, 95% CI 0.38-3.8, p =1.00) Preoperative smoking reduction (50% or less of baseline): 40.5% in intervention group vs 16.7% control (RR = 2.4, 95% CI 1.4–4.2, p = 0.001) Self-reported smoking cessation 7d before the 30d postoperative phone call (PP abstinence): 28.6% in intervention group vs 11% control (RR = 2.6, 95% CI 1.2-5.5, p = 0.008) Postoperative smoking reduction (by 50% of baseline) at 30d postoperative phone call: 32.5% in intervention group vs 20.6% control (RR =	while still providing more intensive intervention than some other brief interventions. The study also addressed the difficulty in encouraging patients to contact a helpline, by faxing a referral (i.e. actively referring), to then initiate contact with patients **Implications:** Patients receiving brief counselling in the preadmission clinic, brochures, NRT, and a referral to a national telephone counselling hotline are more likely to

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					1.58, 95% CI 0.91-2.8, p = 0.14) **Acceptability:** Participants feeling well supported in quitting about the time of surgery: 83.1% in intervention group vs 49.3% control (RR = 1.69, 95% CI 1.3-2.2, p < 0.0005)	quit and reduce smoking perioperatively compared with those receiving standard care. This intervention, and its straightforward implementation, dispels frequently raised objections to more active participation of anaesthetists in preoperative smoking cessation programs
Stein 2013 (US)	RCT	**Community-based** patients experiencing AOD use n=315, 50% female, mean age 39.9yrs	To test nicotine replacement therapy (NRT) that combines nicotine patch prescription plus ad libitum nicotine rescue, for smoking cessation with methadone-	**Intervention:** Varenicline (0.5 mg) with food the evening of the baseline visit. This dose was continued for three days, then increased to two 0.5 mg pills a day for four days, increasing to 1 mg twice daily after one week. Medication was dispensed at 4-week intervals for up to a 24-week course of therapy. Participants were instructed to take varenicline for 1 week before	Biochemically verified PP, self-report continued **abstinence** Only 30 (9.5%) participants reported 7-day abstinence at 6 months (outcome 1), and we were only	**Barriers:** Methadone itself may lead to increases in smoking due to more intense tobacco craving and withdrawal symptoms and decreases in

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
			maintained smokers	attempting to quit smoking on day 8 of the study NRT: Research staff dispensed the nicotine patch. **Control:** The double-blind varenicline-placebo control condition consisted of 24 weeks of placebo tablets using an identical dosing, dispensing, and interview schedule as the active varenicline group	able to confirm abstinence (outcome 2) for 17 (5.4%) of the participants. Between baseline and 6 months there was an overall mean reduction of 8.3 cigarettes/day (outcome 3). Approximately 70.8% (n = 223) reported a reduction in mean CPD, 176 (55.9%) reported a mean reduction of 5 or more CPD, and 118 (37.5%) reported an absolute mean reduction of 10 or more CPD. Only 4 (1.3%) participants reported continual abstinence (outcome 4) from day 14 through the 6-month assessment	respiratory symptoms such as cough Methadone-maintained persons often have psychiatric comorbidities and high levels of stress, and use smoking as an anxiolytic or antidepressant Methadone-maintained smokers may have low self-efficacy, and with high community norms for smoking, may have more difficulty refusing nicotine **Implications:** Novel medication strategies are needed to achieve

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
						smoking cessation for this difficult to treat population Our findings also suggest that a greater understanding of the physiological and psychological causes of low quit rates among opiate-dependent smokers must be addressed in treatment
Vidrine 2013 (US)	Other: Pair-matched group—randomised trial with two treatment arms	**Community-based** health clinics No sample information reported	Evaluate the efficacy of a new electronic health record (EHR) based approach to connect smokers in healthcare settings with treatment Called Ask, Advise, Connect (ACC)	**Intervention:** In both conditions nurses assessed and recorded smoking status of all patients when vital signs were collected. Provided brief advice to quit In intervention, connected patients with the quitline through clicking an	Reach—number of smokers who talked with quitline Intervention: 23.6% of identified smokers talked with the quitline (1707/7237) Control: 0.5% of identified smokers talked with the	**Enablers:** Directly connecting low-income racially/ethnically diverse smokers to the quitline via an automated link in the EHR resulted in a nearly 30-fold increase in treatment

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
				automated link in electronic health record **Control:** Nurses gave smokers willing to accept assistance a quitline referral card	quitline (56/10,722). The empirical logistic transformation approach indicated that the Reach was significantly greater in AAC (vs AAR), t(4)=18.60, p=0.00005	enrolment compared with providing referral cards and asking smokers to call on their own **Implications:** A strength of the study is that AAC was evaluated in a setting representative of real-world healthcare systems that serve smokers disproportionately burdened by tobacco. Additionally, AAC could be implemented broadly in other healthcare settings

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Prochaska 2014 (US)	RCT	**Inpatient** mental health unit n=224, 38% female, mean age 40yrs	To evaluate the efficacy of a motivational tobacco cessation treatment combined with nicotine replacement relative to usual care initiated in inpatient psychiatry	**Intervention:** A transtheoretical model computer intervention with: individualised reporting and exercises tailored to stage of change, triggers and processes of change; a stage-tailored print manual; a 15–30-minute cessation counselling session; and a letter to the participant's outpatient provider requesting cessation support. Post-hospitalisation intervention contacts at months 3 and 6 repeated the computer intervention, which built on participants' earlier responses with individual feedback and next steps for cessation and abstinence. 10 weeks of patch NRT was available from quit decision to 6-month follow-up **Control:** Usual care	**Abstinence outcome:** CO-verified 7-day PPA at 3, 6, 12 and 18-month follow-up included cigarettes smoked in past week or use of any form of tobacco. 7-day PPA rates were 3.2% for control and 13.9% for intervention at 3 months, 6.5% and 14.4% at 6 months, 10.9% and 19.4% at 12 months, and 7.7% and 20.0% at 18 months, respectively **Other:** Demographic variables, psychiatric diagnoses and baseline measures of mood and substance use did not predict	**Implications:** The treatment condition resulted in a greater percentage of abstinent participants than the usual care condition. This was most pronounced at 3 months. Abstinence status was not associated with rehospitalisation at any follow-up point ($p > .282$)

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					abstinence at any follow-up time point (all, p=.156) After hospitalisation, 72% and 50% completed their second and third computer intervention contacts, respectively. About half of intervention participants (49%) accessed study-provided NRT, with a mean of 7 weeks requested (SD = 3 weeks)	
Rohsenow 2014 (US)	RCT	**Community-based** residential AOD treatment program	To compare the effectiveness of brief advice vs motivational interview approaches to motivating smoking	**Intervention:** Procedures applying to both motivational interviewing (MI) and brief advice (BA). Booster sessions (5–15 minutes each) were scheduled for 7 and 30 days after the initial session. All participants were informed of free access to NRT, smoking cessation	**Abstinence outcome:** CO-confirmed 7-day abstinence at 1, 3, 6 and 12 months: Logistic regressions were non-significant	**Enablers:** NRT was used by all who did quit smoking in the first month, so it is probably useful to supply it to any

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
		n=165, 40% female, mean age 33.7yrs	cessation among smokers with alcohol dependence recently admitted to a substance use disorder treatment program	pamphlets, smoking cessation skills groups, and hard candy **MI:** Initial session (45 minutes) and booster sessions **Control:** Brief Advice (BA). Initial session (15 minutes) and booster sessions	for treatment or booster effects The only statistical trends were for booster sessions to result in more abstinence than no boosters at 3 months [model $\chi 2$ (2) = 4.66, univariate $\chi 2$ (1) = 3.09, p<.08, h= .40] and for BA to result in more abstinence than MI at 12-month follow-up [model $\chi 2$ (2) = 4.36, univariate $\chi 2$ (1) = 2.88, p<.09, h= .40] **CPD:** The 2x2 ANOVAs on number of CPD at each follow-up period were non-significant	willing to try it as none were able to quit without it. Booster sessions increased the likelihood of using NRT. BA to quit and MI were attractive to many smokers with AD in SUD treatment. Of the patients with AD in residential treatment who smoked at least 10 cigarettes per day, 72% consented to a study that would give them information about their smoking without requiring cessation Thus, patients with AD in residential

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					NRT use: Used by 50.7% of participants in the first month, by 33.6% in the next 2 months. NRT use did not significantly differ by treatment type or booster condition at 1 month in a logistic regression, but the treatment step was significant for 3-month NRT use, model $\chi 2$ (2) =7.09, p<.03. Within this step, booster condition was significant, Wald(1) = 1.23, B=0.95, p<.02, with 43.8% of those assigned to boosters using NRT compared with 23.9% of those assigned to receive no boosters	SUD treatment may be receptive to low pressure and brief approaches to learning about effects of their smoking and methods of quitting when also offered free nicotine replacement The fact that the program directors supported the smoking interventions also gave an implicit message that smoking cessation would not harm sobriety

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Ebbert 2014 (US)	RCT	**Outpatient** clinical research sites n=506, gender statistics not reported, mean age 42yrs	To determine efficacy and safety of varenicline and bupropion sustained-release (SR; combination therapy) compared with varenicline (monotherapy) in cigarette smokers	**Intervention:** Combination therapy: 12-weeks varenicline + bupropion SR; brief (</= 10mins) behavioural counselling during clinic visits (11 visits) **Control:** Monotherapy: 12-weeks varenicline + placebo pill (matching bupropion SR); brief (</= 10mins) behavioural counselling during clinic visits (11 visits)	CO-verified prolonged **abstinence** (met criteria for 7d PPA + no re/lapses): 53% (intx) vs 43.2% (control), OR 1.49 (95%CI 1.05–2.12), p=.03 CO-verified 7d PPA at week 12: 56.2% (intx) vs 48.6% (control), OR 1.36 (95%CI 0.95–1.93), p=0.09	**Barriers:** We observed a greater attenuation of weight gain at 3 months in participants continuously abstinent from smoking with combination therapy compared with varenicline mono-therapy Anxiety and depressive symptoms were reported more commonly in combination therapy **Implications:** All patients being treated with pharmacotherapy for tobacco

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
						dependence should be monitored for changes in anxiety and mood, an approach consistent with standard clinical practice
Nahvi 2014 (US)	RCT	**Outpatient** AOD treatment programs n=112, gender statistics not reported, mean age 48yrs	To test the efficacy and safety of varenicline for smoking cessation among opioid-dependent methadone maintenance patients	**Intervention:** Varenicline dosing: 0.5 mg/day (days 1–3), 0.5 mg twice daily (days 4–7), then 1 mg twice daily (to week 12) Counselling: brief (less than or equal to 10 minutes), individual, in-person at 0, 2, 4, 8 and 12 week visits + referral to quitline. Delivered by a physician or masters-level tobacco treatment specialist **Control:** Placebo: matching capsules at same dosing schedule as control	CO-verified abstinence at 12 weeks (missing=smoking) INT: 10.5% (n =6) vs CTR: 0% (n=0) p=0.03 Diff(%)=10.5 95%CI=4.4–19.3. 1. CO-verified abstinence at 12 weeks (multiple imputation for missing data)	**Enablers:** The very low cessation rates among our placebo group, despite in-person and telephone counselling, suggest that medication is an important treatment component Because varenicline treatment with brief smoking cessation counselling can be implemented easily

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
				Counselling and quitline referral as intervention	INT: 11.2% (n=6) vs CTR: 0% (n=0) p=0.02 Diff(%)=11.2 95%CI= 4.4–13.6 2. CO-verified abstinence at 24 weeks (missing=smoking). INT: 5.3% (n=3) vs CTL: 0% (n=0) p=0.24 Diff(%)=5.3 95%CI= 0.9–11.8 4. CO-verified abstinence at 24 weeks (multiple imputation for missing data). INT: 6.8% (n=3.9) vs CTL: 0% (n=0) Diff(%)=0.14 95%CI=6.7 0.9–15.4	by medical providers in addiction treatment settings, even a relatively modest treatment effect could have a profound impact because of the high prevalence of smoking in these settings

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Stockings 2014 (Australia)	RCT	**Inpatient** mental health facility n=205, 46.3% female, mean age 37.6yrs		**Intervention:** Usual care + self-help materials; 10–15min motivational interview with project officer; 2-week supply of tailored NRT on discharge; 4 months of fortnightly telephone support with designated counsellor (12-week additional NRT supply, referral to quitline, referral to community-run smoking cessation groups) **Control:** Usual care involved assessment of smoking status and nicotine dependence on admission, provision of brief advice to quit, provision of NRT during admission and for 3 days on discharge, and a post discharge smoking care plan included in the discharge summary	CO-verified continuous abstinence at 6 months: 1.9% (intx) vs 0% (control), p=0.26 CO-verified 7d PPA at 6 months: 7.7% (intx) vs 5.9% (control), OR 1.32, 95%CI 0.47–4.36 NS 4-month follow-up (end of treatment), 7d PPA was significantly higher in the intervention (11.5%) than control (2.0%) condition (OR = 6.46, 95% CI = 1.50–32.77) Use of NRT significantly associated with PPA at 4 months	**Barriers:** The vast majority of participants continued to smoke during admission, and provision of nicotine dependence treatment was inconsistent. **Enablers:** Smoking ban in place and guidelines existing for provision of smoking cessation care **Implications:** The intervention was effective for some, but relapse was high when treatment ended. Additional support

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
						strategies are required to facilitate longer term cessation benefits
Chengappa 2014 (US)	RCT	**Outpatient** mental health services n=60, 41% female, mean age 45.9yrs	To assess the efficacy and safety of varenicline to assist in smoking cessation among patients with bipolar disorder and also assessed whether those patients who ceased smoking in the treatment phase would maintain abstinence during follow-up	**Intervention:** Varenicline tablet of 0.5 mg strength orally at bedtime for days 1–3, increasing to 0.5 mg morning and evening (1 mg/d) for the next 4 days. Starting week 2, the dose was increased to 1 mg twice daily (2 mg/d) for the rest of the 12 weeks Medications for anxiety or insomnia were allowed on an as-needed basis. Medications used to treat bipolar disorder or those being used to treat stable medical conditions were continued. Patients experiencing titration-related side effects were permitted to return to a lower dosage, i.e. 0.5 mg twice/day (1 mg/d). Pill counts and reconciliation from visit to visit served as the measure of adherence, and study medication was stopped at 12 weeks. Smoking	At 3 months (end of treatment), significantly more subjects quit smoking with varenicline (n/n=15/31, 48.4%) than with placebo (n/n=3/29, 10.3%) (OR=8.1; 95% CI, 2.03–32.5; P<.002). At 6 months, 6 of 31 varenicline-treated subjects (19.4%) remained abstinent compared with 2 of 29 (6.90%) assigned to placebo (OR=3.2; 95% CI, 0.60-17.6; P=.17)	**Implications:** This early clinical trial affirms efficacy for varenicline in initiating smoking cessation among clinically stable bipolar subjects motivated to quit smoking; nevertheless, clinical vigilance towards depression and other emergent psychopathology is prudent

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
				cessation counselling at each visit of 15 minutes **Control:** Matched placebo		
Cooper 2014 (UK)	RCT	**Outpatients at** antenatal clinic n=1050, 100% female, mean age 26.3yrs	At delivery, the clinical effectiveness and cost-effectiveness for achieving biochemically validated smoking cessation of NRT patches with placebo patches in pregnancy	**Intervention:** 4-week supply of 15 mg per 16 hours transdermal nicotine patches. Repeated at 4 weeks if abstinence reported Participants set quit dates and research midwives (RMs) provided behavioural support lasting up to 1 hour (standard care SC) plus RMs provided three more telephone behavioural support sessions on participants' quit dates, 3 days afterwards and at 1 month. +/- further smoking cessation services if desired **Control:** 4-week supply of visually identical placebo patches. Repeated after one month if abstinence reported Otherwise, identical to intervention condition	**Primary outcome:** CO-and/or cotinine-verified prolonged abstinence (since quit date) at delivery: 9.4% (intx) vs 7.6% (control) group, OR 1.26, 95% CI 0.82–1.96, NS At 1 month post-randomisation, validated cessation rate 21.3% (intx) vs 11.7% (control), OR 2.05, 95%CI 1.46–2.88	**Barriers:** Adherence to both types of patches was low. Rates of accessing subsequent additional support were similarly low **Implications:** Overall, our findings provide no evidence that NRT should not be used in pregnancy and instead suggest that NRT might be beneficial in this setting

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Zwar 2015 (Australia)	RCT	**Outpatients** of general practices n=2390, gender statistics not reported, mean age 42.3yrs	To evaluate the effectiveness of tailored smoking cessation support, provided primarily by the practice nurse, and compare this with other forms of cessation support	**Intervention:** 1) Quit with practice nurse (PN) initial visit with PN to develop quit plan based on 5As approach; further 3 face-to-face visits to PN encouraged but telephone support from nurse or quitline referral offered to those unable to attend or preferred telephone; + pharmacotherapy [prescribed as assessed on nicotine dependence (8 weeks of patches, or bupropion or varenicline, or other forms of NRT)] 2) Quitline referral: GPs assessed willingness to quit and offered brief advice and quitline referral; + pharmacotherapy **Control:** Usual care: assess willingness to quit and offer assistance	Sustained **abstinence** ≥1 month at the 3-month follow-up [13.1% (Quit with PN) vs 10.8% (quitline referral) vs 11.4% (control), chi sq=2.47, p=0.29] and ≥10 months at the 12-month follow-up [5.4% (Quit with PN) vs 4.4% (quitline referral) vs 2.9% (control), chi sq=5.37, p=0.068] **Other: 7d PPA** at 3-month follow-up [16.3% (Quit with PN) vs 14.2% (quitline referral) vs 15% (control), chi sq = 1.47, p=0.48] and 12-month follow-up [17.1% (Quit with PN) vs 18.8%	**Barriers:** Low uptake of PN and quitline referral interventions; may be due to referrals not being made by GPs **Enablers:** There was a suggestion that PN-led support may be effective if patients can be engaged and maintained in treatment

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
				as usual (could include advice within practice, referral to Quitline or both); + pharmacotherapy	(quitline referral) vs 16.4% (control), chi sq = 1.63, p=0.44] **Uptake** of support: Quit with PN group 57.3% received no support from the PN (no visits); quitline referral group 70% no support from quitline (no calls); usual care group 45.7% no support (no follow-up visits where smoking discussed)	
Lee 2015 (Canada)	RCT	**Outpatient** preadmission surgery clinic n=168, gender statistics not	To determine whether a perioperative smoking cessation intervention to minimise nursing and physician time commitment would reduce long-term	**Intervention:** Intervention group received brief counselling by the preadmission nurse, smoking cessation brochures, referral to a quitline, which proactively made counselling calls as agreed by the patient, and a free 6-week supply of patch NRT. Follow-up call made 12	**Smoking cessation** (7-day PPA) occurred in 5/60 (8%) control patients compared with 17/67 (25%) patients in the intervention group (RR=3.0; 95% CI, 1.2–7.8; p = 0.018)	**Enablers:** Minimised patient/client burden and clinician contact time

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
		reported, mean age 47.5yrs.	smoking abstinence rates, and to explore preoperative factors associated with successful long-term abstinence	months after first preadmission encounter **Control:** Usual care	12 months postoperative. Intervention participants were 2.7 times (95% CI, 1.1-6.7; p = 0.028) more likely to achieve long-term cessation than control participants, controlling for nicotine dependence **Other:** Additional to the intervention (aOR, 3.5; 95% CI, 1.02-3.9; p = 0.046), lower baseline nicotine dependence (Fagerstrom <4) predicted cessation success at 1 year (aOR, 6.3; 95% CI, 1.9-24.8; p = 0.001)	**Implications:** This study supports ease of implementation of the intervention and long duration follow-up given minimal patient time spent in clinic, and no required visits beyond the preadmission appointment, simplifying clinical implementation of similar interventions

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Bernstein 2015 (US)	RCT	**Outpatient** hospital emergency department n=778, 47.6% female, mean age 40.5yrs	To study the efficacy of a 6-week intervention incorporating motivational interviewing, nicotine replacement and quitline referral for adult smokers in an ED	**Intervention:** Intervention subjects received a motivational interview by a trained research assistant, 6 weeks' worth of nicotine patches and gum initiated in the ED, a faxed referral to the state smokers' quitline, a booster call and a brochure **Control:** Control subjects received the brochure, which provided quitline information	The primary endpoint was biochemically confirmed 7-day **abstinence** from tobacco at 3 months INT 12.2%(47/386) vs CTL 4.9% (19/388)—difference in quit rates of 7.3% (95% CI 3.2%–11.5%) Secondary endpoints at 3 months: - 24h quit attempt since ED visit: INT 68.4% (264/388) vs CTL 55.9% (217/390) Diff = 12.5% (95%CI 5.6–19.1) - 7d abstinence, self-rep: INT 16.6% (64/388) vs CTL 8.5% (33/390) Diff =	**Enablers:** - although medication and counselling are each effective, combination treatment offers greater efficacy - initiated medication management in the ED. This allowed us to demonstrate to the subject their ease of use, ability to alleviate nicotine withdrawal, and excellent tolerability - we provided 2 forms of NRT: long acting and short acting **Implications:** ED-based tobacco

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					8.1% (95%CI 3.4–12.8) - change in daily cigarette consumption, mean (95% CI): INT -9.1 (-10.0 to -8.2) vs CTL -5.9 (-6.9 to -4.9) Diff = 3.2 (95%CI 1.9 to 4.5)	interventions represent an important opportunity to increase national rates of tobacco abstinence
Eisenberg 2016 (Canada)	RCT	**Inpatients**, hospital n=302, gender statistics not reported, mean age 55yrs	Whether varenicline, begun in-hospital, is efficacious for smoking cessation following acute coronary syndrome (ACS)	Treatment commenced in hospital **Intervention:** Varenicline while hospitalised with first dose prior to discharge. 12 weeks. Low-intensity counselling (advice to stop smoking and importance of smoking abstinence following ACS). Before discharge and during follow-up (telephone contact and clinic visits)—12 weeks **Control:** Placebo. Plus low-intensity counselling as in intervention	CO-verified point prevalence smoking **abstinence** at 24 weeks: 32.5% point prevalence abstinence (control) v 47.3% (intervention); (% difference 14.8%; 95% CI 3.9, 25.8%; number needed to treat = 6.8) **Other:** CO-verified continuous	**Barriers**: None identified. **Enablers:** Low-intensity counselling easy to administer

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					abstinence: significantly different at 4 (control 32.5%, intervention 52%, p<0.001) and 12 weeks (control 29.8%, intervention 44.3%, p=0.013) but not at 24 weeks: absolute rates 35.8% and 25.8%, respectively (% difference 10.0%; 95% CI -0.4, 20.4%; number needed to treat = 10.0) Reduction <=50% in CPD significantly different at 4, 12 and 24 weeks—absolute rates 67.4% and 55.6%, respectively at week 24 (% difference 11.8%; 95% CI 0.75, 22.7%;	

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					number needed to treat = 8.5)	
Thomas 2016 (Australia)	RCT	**Inpatients** in 3 hospitals n=600, 36% female, mean age 51yrs	To evaluate the effectiveness of a pharmacist-led multi-component smoking cessation program (GIVE UP FOR GOOD) compared with usual care in hospitalised smokers	**Intervention:** Multi-component hospital pharmacist-led intervention: behavioural counselling (5As; =>3 sessions: during stay, on discharge, 1 month post-discharge); pharmacotherapy encouraged and freely available during stay + 1 week's free supply on discharge (those eligible for government subsidy received 28-day free supply; nicotine patch, bupropion or varenicline); self-help resources provided; referral to quitline offered; interested patients had smoking treatment summaries and discharge plans sent to their GP and community pharmacists for further support post discharge **Control:** Usual care: free smoking cessation medications (NRT, varenicline, bupropion) available during hospital stay (not always systematically offered); brief counselling provided at staff discretion; subsidised 28d supply	**Primary outcome:** CO-verified sustained **abstinence** rates for intervention and control groups were not significantly different at 6 months [11.6% (34 of 294) vs 12.6% (37 of 294) OR=0.91, 95%CI = 0.55–1.50] and 12 months [11.6% (34 of 292) vs 11.2% (33 of 294); OR = 1.04, 95% CI = 0.63–1.73] **Uptake:** Use of pharmacotherapy was higher in the intervention group,	**Barriers:** Only a minority reported receiving any help from their GP or community pharmacist and using quitline. A better system to link discharged patients with primary healthcare providers may improve the follow-up support and cessation outcomes. Even though pharmacotherapy was offered to all our intervention participants, half of them did not take up the offer and those who did used

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
				of pharmacotherapy available to those eligible	both during hospital stay [52.3% (157 of 300) vs 42.7% (128 of 300); P = 0.016] and after discharge [59.6% (174 of 292) vs 43.5% (128 of 294); P < 0.001]	it for only a short period. This suggests that longer-term abstinence requires more intensive pharmacological assistance and a longer duration of follow-up support than was provided **Enablers:** All participating hospitals had a smoke-free policy and all in-patients had free access to smoking cessation medications during their hospital stay
Lindson-Hawley 2016 (UK)	RCT	**Outpatients** in primary care clinics	To test whether an initial gradual reduction in smoking results in non-inferior quit rates compared	**Intervention:** Participants set a quit day 2 weeks after enrolment by a nurse, and the intervention differed between groups only during these weeks. Both groups received withdrawal-oriented therapy support,	4-week abstinence (biochemically validated), was achieved by 39.2% (CI, 34.0%–44.4%) for gradual cessation	**Implications:** Study showed clear evidence that quitting abruptly was superior in the short and longer

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
		n=697, 50% female, mean age 49yrs	with abrupt cessation	and used the same NRT after quit date, to 8 weeks post quit date Gradual cessation: NRT was provided during reduction (patch 21 mg/d, and a short-acting NRT option (gum, lozenges, nasal spray, sublingual tablets, inhalator or spray) **Control:** none reported	and 49.0% (CI, 43.8%–54.2%) for abrupt cessation. Non-inferiority was not shown (unadjusted RR, 0.80 [90% CI, 0.68–0.96]). At 4 weeks, abstinence was significantly less likely for gradual cessation than for abrupt cessation (adjusted RR, 0.80 [95% CI, 0.66–0.93]) **Other:** 7-day CO-verified PPA in gradual vs abrupt cessation groups at 4 weeks (42.7% vs 53.8%, RR=0.83, 95%CI=0.72,Äì0.98), 8 weeks (31.0% vs 38.3%, RR=0.81, 95%CI=0.68,Äì1.04), and 6 months	term. Adherence to behavioural instructions and pre-quit NRT was good, and medication was well tolerated. Participants who preferred to quit gradually were less likely to achieve abstinence, regardless of allocated condition. In clinical practice, patients should be encouraged to stop smoking abruptly and not gradually

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					(18.4% vs 26.5%, RR=0.70, 95%CI=0.51,Äì0.97)	
Warner 2016 (US)	RCT	**Inpatients** in hospital n=600, gender statistics not reported, mean age 46.3yrs	To test the hypothesis that a brief intervention to facilitate the use of telephone quitline services for both initial and follow-up counselling is effective in helping patients achieve sustained abstinence	**Intervention:** A single brief (5 minute) quitline facilitation intervention was delivered. This included advice to quit and quitline information. Brochure provided, quit-card provided; study personnel facilitated contact with quitline provider (warm handoff via direct phone call or else fax referral). All participants offered NRT while hospitalised (routine care) and a free 2-week supply of nicotine patches at discharge **Control:** Brief counselling session (5 mins) including the first four of the 5As (ask, advise, assess, assist and arrange), brochure provided included quitline number + NRT	Primary outcome: **Self-reported 7d PPA** (urine anabasine levels verified at 6-month follow-up only): 7d PPA rates were not significantly different between quitline and control groups at any assessment (33% vs 36%, p=0.49 at 7days; 31% vs 31%, p=1.0 at 30days; 24% vs 24%, p=1.0 at 6 months (non-verified); 11% vs 7%, p=0.07 at 6 months verified) NRT initiated in hospital: 46% (intx)	**Barriers:** A minority of patients in the quitline group actually received any quitline counselling and only 57 (19%) received the multiple counselling sessions that prior work suggests is necessary for efficacy There were logistic challenges in connecting patients to counsellors (e.g. short lengths of stay and interruptions for treatments and diagnostic testing)

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					vs 40% control, p=0.12 NRT ordered for use at discharge: 77% (intx) vs. 77% (control), p=1.0	**Enablers:** The authors noted patients were most likely to connect with counsellors at the time of the intake call. Thus, the authors worked with the quitline provider to maximise the immediate availability of counsellors, and study personnel facilitated the calls **Implications:** Although a relatively high proportion of smokers self-reported abstinence from smoking at 6 months after hospital discharge,

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
						the quitline facilitation intervention did not improve abstinence rates compared with a standard brief stop-smoking intervention
Anthenelli 2016 (16 countries across five continents)	RCT	**Outpatients** mental health clinics n=8058, 56% female, mean age 46.5yrs	To compare the relative neuropsychiatric safety risk and efficacy of varenicline and bupropion with nicotine patch and placebo in smokers with and without psychiatric disorders	**Intervention:** Participants in all four conditions required to take study medications as masked tablets (dispensed in separate varenicline and bupropion pill bottles each with matching placebo) along with either applying active or placebo patches on a daily basis + Smoking cessation counselling (<=10mins) at each clinic visit (up to 15) Intx group 1) Varenicline: 12 weeks (1 mg twice a day); placebo patch	CO-verified continuous abstinence weeks 9–12: [OR (95%CI)] Varenicline vs placebo 2.74 (2.28–3.30), p<0.0001; bupropion vs placebo 1.89 (1.56–2.29), p<0.0001; NRT patch vs placebo 1.81 (1.49–2.19), p<0.0001; varenicline vs patch 1.52 (1.29–1.78), p<0.0001; bupropion vs patch 1.04 (0.88–1.24), p<0.0002;	**Implications:** Trial provides further evidence that varenicline and bupropion can be used safely by psychiatrically stable smokers. No significant increase in neuropsychiatric AEs attributable to varenicline or bupropion relative to nicotine patch or placebo

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
				Control: Active control (NRT): 12-weeks' supply 21mg patch with taper. Placebo pills and placebo patch	varenicline vs bupropion 1.45 (1.24–1.70), p<0.0001	
Sherman 2016 (US)	Other: Randomised comparative effectiveness trial	Hospitalised **inpatients** n=1618, gender statistics not reported, mean age 48.5yrs	To compare the effectiveness of two post-discharge cessation interventions	**Intervention:** 6–7 (within 2w of discharge, then follow-up at day 1, 3, 7, 14, 30, 42) x approximately 10–15 min intensive telephone counselling from study staff in English, Spanish, or Mandarin (masters-level counsellors with mental health training, with structured counselling protocol based on MI and Problem Solving Therapy) +/- NRT (8w, if they had not received an NRT prescription at discharge) **Control:** Usual care: fax/online referral to the state quitline for proactive outreach and counselling (with some variation between state-based services), approximately 1x 15–20m counselling session with a follow-up call +/- NRT (counsellors assured any requested NRT was received)	Self-reported (30-day PP) abstinence at 6m follow-up. The rate of abstinence was higher in the intensive counselling arm than the quitline arm at 6 months (37.4% vs 31.5%; relative risk=1.19; 95% CI=1.01, 1.40) **Other:** At follow-up, the rate of abstinence (30-day point prevalence) was higher in the intensive counselling arm than the quitline arm at 2 months (29.0% vs 20.7%;	**Barriers:** Variability in counselling Expense: Mean costs per patient were $17.84 in the quitline arm and $76.62 in the intensive counselling arm. Cost per quit for intensive counselling, relative to quitline referral, was $1015 per patient quitting smoking (95% CI=$516, $43,013) **Enablers:** "Although the

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					relative risk=1.40; 95%CI=1.13, 1.73)	intensive counselling arm was more effective, even electronic transfer to the state quitline yielded a very good abstinence rate. These two interventions were selected because both could readily be adopted by any hospital." **Implications:** Hospitalisation presents an important opportunity for reaching smokers and initiating a cessation intervention; post-discharge interventions are effective and should become

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
						routine care for all hospitals
Cummins 2016 (US)	RCT	**Inpatients**, hospital n=1270, gender statistics not reported, mean age 49.5yrs	Test the effectiveness of telephone counselling vs nicotine patches for maintaining abstinence post hospital discharge	**Intervention:** Patches: given 8 weeks' worth of patches at discharge + encouraged to put patch on at discharge. Patch strength varied per smoking history Counselling: Proactive quitline counselling calls to patients post discharge Patches + counselling: both above **Control:** Usual care: included supply of quitline number from ward/hospital staff	**2 month quit 30 days+** No patches: 19% n=633 Patches: 23% n=637 No counselling: 20% n=636 Counselling: 21.8% n=634 **6 month quit 30 days+** No patches: 18% n=633 (cotinine 6.0) Patches: 23% n=637 (cotinine 6.9) No counselling: 21% n=636 (cotinine 8.0)	**Barriers:** Addresses and phone numbers were not always accurate and patients were not always released back to their homes (p.584). Only 2/3 of participants meant to receive patches actually did receive them. Patches were mailed but sometimes didn't arrive **Enablers:** Low uptake, no real effect. Participants often did not answer counselling calls (10+ attempts), or refused counselling

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					Counselling: 20% n=634 (cotinine 4.9)	when reached (20%)
Richter 2016 (US)	RCT	Hospital **inpatient** setting n=1054, 55% female, mean age 50yrs	To determine the relative effectiveness, and cost effectiveness, of warm handoff vs fax referral for transitioning inpatient smokers to post-discharge care	**Intervention:** Warm handoff: Individualised NRT + initial counselling session + arranging for prescriptions on discharge + first quitline call organised during hospital stay, on the line, for transfer to patients' mobile/bedside phone, then counsellor follow-up after quitline session (includes written info and up to 5 calls after discharge) **Control:** Fax referral: Individualised NRT + initial counselling session + arranging for prescriptions on discharge + referral to quitline on day of discharge (includes written info and up to 5 calls after discharge)	**Abstinence** at 6 months verified by salivary cotinine (≤15 ng/mL), CO (≤11 ppm), or proxy (staff contacted proxies to verify abstinence among participants who did not provide cotinine or CO) Int 25.4% vs Ctl 25.3% (AOR=1.02, 95% CI=0.77, 1.35; p=0.88; RR=1.02, 95% CI=0.82, 1.24) **Uptake:** Significantly more warm handoff participants than fax participants enrolled in quitline services	**Enablers:** The costs for both interventions were the same; hospitals, however, bore less of the costs for the warm handoff. Integrating quitlines into health services such as hospital care can help care providers to provide high-quality tobacco treatment by providing a reliable and accessible referral option **Implications:** Warm handoff was more effective than fax referral at enrolling

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					(99.6% vs 59.6%; AOR=177.18, 95% CI=43.70, 718.41; p<0.001; RR=1.67, 95% CI=1.65, 1.68) Comparing only received post-discharge counselling calls, there were no significant differences between study arms: Int patients averaged 1.30 (SD=1.39) calls, and control patients received 1.25 (SD=1.71) calls (p=0.61)	hospitalised smokers in quitline services. This, however, did not translate into any advantage in quitting
Fellows 2016 (US)	RCT	Acute **inpatient** care services n=898, 54% female, mean age 53yrs	The study tested the hypothesis that adding an assisted referral to outpatient quit services and interactive voice	**Assisted referral (AR) plus interactive voice recognition (IVR) intervention:** In addition to usual care, assistance in enrolling in outpatient cessation programs (e.g. quitline), arranging for quit medications (e.g. NRT, varenicline, bupropion) to be	**Abstinence:** Self-reported 30d abstinence (at 6mo post-randomisation): unadjusted mean predicted probabilities of	**Barriers:** The AR process **Enablers:** ARs pragmatic strategy

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
			recognition follow-up to a bedside smoking-cessation consultation would significantly increase self-reported 30-day abstinence at 6-month follow-up compared with the bedside consult service only	included in discharge medication orders; post-discharge treatment recommendations sent to patients' primary source of healthcare; **IVR intervention:** provided via a standard automated calling system for participants. After discharge: four IVR follow-up calls over a 7-week period, at days 4, 14, 28 and 49 **Control:** (usual care) trained cessation specialist conducted ~15-minute consults at bedside. Provision of self-help materials. Access to quit programs and medications differed across sites and insurance coverage	quitting were 18% for intervention group and 17% for control group (OR = 1.10, 95%CI = 0.78, 1.53, p = 0.569) Self-reported **continuous abstinence** (at 6mo post-randomisation): 13% for intervention group and 14% for control group. Biochemically confirmed **7d abstinence** (salivary cotinine and exhaled CO): unadjusted 10% for both intervention and control groups (n = 453 with in-person follow-up assessment)	for busy clinicians. Hospitals supported the use of dedicated staff to deliver bedside consultations (removes responsibility from busy nursing staff) **Implications:** AR program had little effect on patient-reported counselling and a small effect on medication use compared with usual care

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Nanovskaya 2017 (US)	RCT	**Outpatient** clinics Pregnant patients of obstetrics and gynaecology clinics n=65; 100% females; mean age 28yrs	To determine whether bupropion SR reduces nicotine withdrawal symptoms on the quit date and during medication treatment and whether it increases 7-day PPA at the end of medication treatment and at the end of pregnancy compared with placebo	**Intervention:** 10 visits including 35-minute counselling sessions at each of the first 2 visits and 10-minute nurse-led MI cessation counselling at subsequent visits Bupropion SR for 12 wks **Control:** Matched counselling sessions plus placebo medication.	**Abstinence: 7day** biochemically-verified PPA (CO/cotinine) **During the treatment** assessment period (visits 2–6): control (2%) intervention (19%) (p=.003) **End of medication treatment** (visit 6): control (3%) vs intervention (17%) (p=.087) NS **End of pregnancy** (visit 7): control (3%) vs intervention (10%)(p=.328) NS During post-partum period (visits 8–10). NS	**Barriers:** Unknown cause of high dropout (30% of subjects in intervention group vs 11% in the control group, p=.12) **Implications:** Bupropion SR reduced nicotine cravings and withdrawal symptoms compared with placebo and increased overall cessation rates during medication treatment

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Goodney 2017 (US)	RCT	**Outpatient** clinics Patients of vascular surgery practices n=156; overall gender split not reported; mean age 60.9yrs	Determine the feasibility and potential efficacy of a standardised smoking cessation intervention (brief advice, NRT, quitline referral) delivered by vascular surgeons to smokers with peripheral arterial disease	Standardised brief smoking cessation **intervention**: 1) physician-delivered "very brief advice" about smoking cessation, 2) provision of a prescription for NRT, 3) active fax-based referral to quitline **Control**: Usual care for smoking cessation	Primary outcome: self-reported 7d PPA at 3-month post intervention follow-up: 40.3% (intx) vs 30.9% (control), p=0.250	**Barriers:** Populations that include smokers who are not ready to quit smoking. 30% reported being not motivated to quit, and many of these patients were difficult to reach in follow-up **Enablers:** Surgeons at the intervention sites were able to deliver the smoking cessation intervention successfully, including the quitline referral and medication components, with little disruption of their clinical

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
						workflow and without substantive changes in existing clinical support staff **Implications:** The most important aspects of this intervention appear to be the advice from the surgeon as well as encouraging the patient facing surgical treatment to use NRT as a tool to assist smoking cessation
Farley 2017 (UK)	MM	**Community-based**, in pharmacies n=68; overall gender split not reported; mean age 44yrs	To investigate the feasibility of implementing a reduction program in community pharmacies	2x2 factorial (short vs standard length program X behavioural support vs self-help): 1) Randomised either to receive behavioural support (pharmacist counselled participant and provided support to reduce consumption over 8x10min sessions) or provided with	Biochemically verified prolonged **abstinence** at 6mo, self-reported abstinence at 4wks or 6mo, and sustained smoking reduction	**Barriers:** Training pharmacists in methodology **Enablers:** Participants saw this as a means of

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
				self-help resources (resource explained same process in a written booklet) to guide them to achieve the same reduction 2) Randomised to reduce consumption rapidly, halving consumption by two weeks, compared with the standard reduction schedule, halving consumption by six weeks All received NRT (patch + short acting) and advised to replace each 'missing' cigarette with a short-acting dose	No significant cessation outcomes: There was no difference in the rate of self-report 4wk abstinence in the short program compared with standard length (RR 95%CI 1.00 (0.24, 4.10)) and a non-significant 56% reduction in floating 4wk abstinence with behavioural support compared with self-help(RR 95%CI 0.44 (0.10, 1.95)). The corresponding odds ratios (95%CIs) from the generalised linear mixed model were 1.05 (0.20, 6.00) and 0.48 (0.09, 2.69)	achieving abstinence or a brief reduction

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Wong 2017 (Canada)	RCT	**Outpatient** setting with patients of a preoperative clinic n=296; 63% males and 37% females; mean age 51.8yrs	To determine effectiveness of a multifaceted smoking cessation program compared with brief intervention in preoperative clinics to increase short-term and long-term abstinence in surgical patients	**Intervention:** A 12-week smoking cessation program comprising a 10–15-minute preoperative counselling session (delivered by a smoking cessation counsellor, anaesthesiologist or pharmacist); 3-month supply of varenicline; educational pamphlet; and referral to quitline for proactive telephone counselling (within 48hrs after first visit) **Control:** Brief advice on cessation and quitline information for self-referral. Brief advice was delivered by a smoking cessation counsellor anaesthesiologist or pharmacist	**Quit rate:** Biochemically verified (cotinine) 7-day ITT PPA rate 12 months after the start of treatment. Higher for smoking cessation program compared with the brief advice: 42.4% vs 26.2% (RR, 1.62; 95% CI, 1.16–2.25; P = .003) Secondary outcomes biochemically verified (cotinine**) 7-day ITT PPA** higher in smoking cessation program compared with brief advice at 1 (45.7% vs 25.5% (RR, 1.79; 95% CI, 1.29–2.49; P < .001), 3 (46.4% vs 26.9% (RR, 1.72; 95% CI,	**Barriers:** Patients infrequently place calls to quitlines when they are asked to self-refer **Enablers:** Many patients participating in the study desired the free 3-month supply of varenicline **Implications:** A smoking cessation program with brief counselling, pharmacotherapy, educational materials and proactive quitline referral can increase long-term abstinence above brief counselling

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					1.25–2.37; P≤ .001), and 6 (45.0% vs 26.2% (RR, 1.72; 95% CI, 1.24–2.38; P < .001) months after the initial quit date Continuous **abstinence** was higher in smoking cessation group than brief advice group at 1 (31.8% vs 16.6% (RR, 1.92; 95% CI, 1.25–2.96; P = .002), 3 (33.8% vs 18.6% (RR, 1.72; 95% CI, 1.25–2.37; P = .003), 6 (34.4% vs 18.6% (RR, 1.72; 95% CI, 1.24–2.38; P = .002) and 12 (31.8% vs 16.6 (RR, 1.62; 95% CI, 1.16–2.25; P = .002) months	and quitline self-referral

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Kumar 2017 (Ireland)	Two-arm parallel group RCT	Hospital **inpatients** n=67; overall gender split not reported; mean age 58.3yrs	To determine if brief student-led counselling could enhance motivation to quit and smoking cessation behaviours among hospitalised patients	**Intervention:** Medical students delivered a brief (~15 min) consultation with the patient that was based on principles of social cognitive theory and motivational interviewing **Control:** Usual care (e.g. a visit from the smoking cessation officer). If patients request cessation services, physicians may prescribe pharmacotherapy and/or refer them to the hospital cessation officer or the national quitline	Quit rate: **7-day PP abstinence** rates 3 months: Intervention: PP = 22.7% (n = 22) ITT = 27.3%; Control: PP = 4.4% (n = 23) ITT = 5.9%; Per protocol - OR = 6.47 (.69 to 60.7), p = .102 ITT - OR = 6.0 (1.18 to 30.3), p = 0.030* **6 months:** Intervention: PP = 58.8% (n = 17) ITT = 30.3%; Control: PP = 20.8% (n = 24) ITT = 14.7%; Per protocol - OR = 5.43 (1.37 to 21.6), p = .016* ITT - OR = 2.52 (0.76 to 8.41), p = 0.132 **Quit attempts** (any = 1, none = 0) **3 months:** Intervention: PP =	**Enablers:** It appears feasible for medical students to be cessation interventionists during their training, and this training and intervention practice was appreciated by students

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					50% (n = 22) ITT = 42.4%; Control: PP = 39.1% (n = 23) ITT = 29.4% **6 months:** Intervention: PP = 70.6% (n = 17) ITT = 36.4%; Control: PP = 41.7% (n = 24) ITT = 29.4% **Per protocol analysis 3 months**- OR = 1.56 (.48 to 5.08), p = .464 ITT at 3 months - OR = 1.77 (.64 to 4.86), p = .269 **Per protocol 6 months** OR = 3.36 (.90 to 12.6), p = .072 ITT 6 months - OR = 1.37 (.49 to 3.81), p = .545 **Repeated measures** (random	

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					effect analyses) OR = 2.1 (.89 to 5.0), p= .089 **Receipt of professional quit advice** 3 months Intervention: PP = 40% (n = 20) ITT = 24.4%; Control: PP = 27.3% (n = 22) ITT = 17.7%. 6 months Intervention: PP = 46.7% (n = 15) ITT = 21.2%. Control: PP = 42.1% (n = 19) ITT = 23.5%; Per protocol 3 months OR = 1.78 (.48 to 6.5), p = .384 ITT 3 months - OR = 1.49 (.46 to 4.9), p = 0.508; Per protocol 6 months OR = 1.2 (.31 to 4.7), p = .790 ITT 6 months OR = 0.875 (0.28 to 2.77), p = .820 Repeated measures (random effects analysis) OR	

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					= 1.56 (.52 to 4.7), p=.429	
Cheung 2018 (Canada)	RCT	**Outpatient** setting. Medically stable patients presenting to ED n=1295; 38% females; 62% males; mean age 40.5yrs	To determine whether brief ED-initiated counselling followed by referral to our provincial counselling service would increase 12-month 30-day quit rates in medically stable adult smokers	**Intervention:** Brief (30 seconds) ED intervention including a pamphlet and an offer for a community counselling service referral by emergency physician (offered quitline, text-based program and web-based program). Patients were contacted by the community service within a week after referral to confirm counselling access **Control** arm received usual care (no information about community counselling service)	12-month, 30-day smoking **cessation rate**. Intervention (20.8%) vs control (18.1%) (p>.05) NS **30-day PPA**. Intervention vs control: 1 month (7.7% vs 9.6% aOR=0.86), 3 months (13.2% vs 13.6%, aOR=1.31), 6 months (15.9% vs 14.7%, aOR=1.58), 12 months (20.8% vs 18.1%, aOR=1.60) **7-day PPA.** Intervention vs control: 1 month (13.0% vs 15.7% aOR=0.85), 3 months (18.4% vs 19.1%, aOR=1.25), 6	**Barriers:** Results may not be generalisable to other EDs with different patient demographics (only one academic ED included) **Enablers:** As part of the screening process, patients were asked whether they had used tobacco in the last 30 days. Therefore, all enrolled patients essentially received the first step of the three-step 'ask, advise, refer' intervention... the 1-, 3-, 6- and 12-

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					months (19.5% vs 19.4%, aOR=1.28), 12 months (24.9% vs 21.7%, aOR=1.63)	month follow-up phone calls may have also increased quit rates among both the intervention and control groups **Implications:** Though best ED referral practices are still unclear, the extensive reach of emergency physicians, may have a significant public health impact
Brown 2019 (UK)	RCT	**Community-based** patients of smoking-cessation clinics n=159; overall gender split not	To test whether, compared with a control group, prompting smokers explicitly to self-incentivise if they abstain from smoking for a week	Weekly self-incentivising implementation intention: if participant abstained after one week, they selected one self-incentive from a list of 10 self-incentives with monetary costs (e.g. going out for a meal) and 10 self-incentives without monetary costs (e.g. a walk)	**28-day CO-verified ITT PPA** at 3 and 6 months post intervention. At 3 months, significantly more participants abstained for at least	**Enablers:** Self-incentives could be easily incorporated into future treatment manuals, as this is a quick, easy to explain technique that is

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
		reported; mean age 38.6yrs	or a month encouraged sustained abstinence	Monthly self-incentivising implementation intention: if participants abstained after a month, they selected a self-incentive from the same list for the weekly condition Active **controls** were asked to form a simple quit smoking plan without requiring implementation intentions	28 days in the weekly (15/44; 34.1%), χ2 (1, n=109)=5.20, p<.05, d=0.45 and monthly (18/50; 36.0%), χ2 (1, n=115)=6.52, p<.05, d=0.49, self-incentivising conditions than in the active control (10/65; 15.38%) At 6 months, significantly more participants abstained for at least 28 days in the weekly (13/44; 29.6%), χ2 (1, n=109)=3.16, p<.05, d=0.35, and monthly (17/50; 34.0%), χ2 (1, n=115)=5.45, p<.05, d=0.45, self-incentivising conditions compared with the active	self-completed by the smoker **Implications:** Self-incentivising is an effective technique for smoking abstinence. Implementation intentions encourage use and administration of self-incentives contingent on achieved smoking abstinence

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					controls (10/65; 15.38%)	
Schnoll 2019 (US)	RCT	**Outpatients** of cancer treatment clinics 50% males; 50% females; mean age 58.5yrs	Assess the efficacy and safety of extended varenicline treatment for tobacco use among cancer patients	**Intervention:** 24 weeks of varenicline; 7 guideline-based smoking cessation counselling sessions over 24wks (4 in person; 3 by phone) **Control:** Usual care; 12 weeks of varenicline followed by 12 weeks of placebo; 7 guideline-based smoking cessation counselling sessions over 24wks (4 in person; 3 by phone)	**CO-verified 7d PPA at 24 weeks** [30.5% (intx) vs 27.5% (control), OR=0.71, 95%CI 0.38–1.34, p=0.29] and 52 weeks [16.2% (intx) vs 15.7% (control), OR=0.92, 95%CI 0.43–1.96, p=0.83] CO-verified **continuous abstinence** 9–24weeks [21% (intx) vs 18.6% (control), OR = 0.78; 95% CI, 0.39,-1.57; p=0.39] and 9–52weeks [15.7% (intx) vs 10.5% (control); OR = 1.61; 95% CI, 0.70,-3.70; p = 0.26]	**Barriers:** based on pill count, less than 50% of the sample were adherent to varenicline

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Rajaee 2019 (US)	RCT	**Inpatient/ outpatient** of a vascular surgery clinic n=59; overall gender split not reported; mean age 59.8yrs	To evaluate the efficacy of a smoking cessation intervention delivered by vascular surgeons in the perioperative period (provider-based, standardised, and focused smoking-cessation counselling session), compared with current smoking cessation practice, on smoking behaviour for smokers with peripheral arterial disease	**Intervention**: standardised (consequences of smoking) 5min PowerPoint presentation shown on a portable electronic notebook. Delivered by one vascular surgery resident provider. Delivered in the same setting as the management for the patients' vascular disease (i.e. clinic or perioperative setting as relevant) NRT: 2 weeks' supply (patches) All patients were referred to a separate smoking-cessation program already established at the hospital **Control:** Usual care at discretion of the vascular surgeon seeing the patient) NRT: 2 weeks' supply (patches) All patients were referred to a separate smoking cessation program already established at the hospital	CO-verified **smoking cessation** or self-reported smoking **reduction** by >50% of baseline **1mo** after the initial encounter: Intervention (59.3%) vs control (39.3%) p = 0.18. NS **>6mo** after the initial encounter: Intervention (88%) vs control (68%) p = 0.1. NS **Other outcomes:** **Change in nicotine dependence: At 1mo** follow-up: Intervention (1.6 point significant decrease, p = 0.011); control (1 point decrease, p = 0.059, NS)	**Barriers:** Suggested that (to explain low enrolment) vascular patients may be in the pre-contemplative phase of change in the process of smoking cessation, meaning that they are not thinking about changing their smoking habits, and that may reflect an overall lack of motivation for medical follow-up and lifestyle modification **Enablers:** A brief PowerPoint presentation, delivered by only one surgical

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					At longer-term (>6mo) follow-up: intervention (3.7 point significant decrease, p = 0.0001); control (2.4 point decrease, p = 0.018, NS) **Uptake after brief int:** 10.2% attended the smoking-cessation program established at the hospital (3 participants in each treatment arm)	provider, there was little to no variation in counselling, which allowed for better validation of the effect of the counselling session and is easily reproducible **Implications:** A large proportion of patients with vascular disease who received smoking-cessation counselling delivered by a vascular surgery provider reduced their smoking consumption after 6 months
Reid 2020	RCT	**Outpatient** hepatology clinic	To compare the effectiveness of an NRT and telephone	Both intervention and control groups received telephone counselling: 1 contact; support, encouragement and	**Changes in cigarettes smoked** at 6 weeks: no	**Implications:** Nicotine replacement

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
(Australia)		n=92; 73% males; 27% females; mean age 47yrs	counselling intervention with a control (telephone counselling alone) in reducing smoking rates in people with chronic hepatitis C	resources, assessing nicotine dependence, determining habits and routines for smoking, discussing motivations for and barriers to smoking cessation, and individually tailoring a quit plan Intervention group also received NRT for 8 weeks provided by nurse practitioner	difference between treatment groups, with patients in the control group reporting a reduction of 5.0 (CI: 1.6, 8.3) cigarettes per day, while the intervention group reported a reduction of 5.4 (CI: 2.4, 8.4) cigarettes per day (t=0.212, p= .828) **Other outcomes**: Changes in cigarettes smoked at 12 weeks: the control group reported a reduction of 1.7 (CI:-1.6, 5.0) cigarettes per day, compared with the intervention group, who reported a reduction of 6.7 (CI: 3.0,10.4) cigarettes per day, statistically significant reduction	therapy (preferably at no cost to the patient) and referral for an individualised telephone counselling intervention such as quitline by nurse practitioners are recommended for this population

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					of cigarettes (t= 2.022, p=.048)	
Guillaumier 2020 (Australia)	RCT	Community-based patients of AOD services n=896; 58% males; 42% females; mean age 37yrs	To test the effectiveness of an organisational change intervention integrating smoking cessation treatment into usual alcohol and other drug (AOD) treatment, compared with usual care	12-week intervention phase: - 6 weeks pre-client recruitment - 6 weeks during client recruitment First 6 weeks: Services received an organisational change intervention, including assistance in developing smoke-free policies, nomination of champions, staff training and educational client and service resources, and free NRT in order to integrate smoking cessation support as part of usual client care Second 6 weeks: Smoking cessation treatment for participants included NRT (patches, lozenges, gum, nasal spray and inhalers); written materials; referral slips for telephone quitline, quit kits and quit plans; and information about other resources such as online programs and smartphone applications	Individual client smoking cessation at 8-week follow-up using CO-verified 7-day PPA and at 6mo using self-reporting 8 weeks: Verified 7-day PPA : Usual care (UC) 8 (1.8%). Intervention (Int.) 12 (2.6%) p=0.622 6.5 mo: Verified 7-day PPA : UC 0. Int. 1 (0.2%) p=0.622 **Other outcomes:** **Prolonged abstinence:** Self-reported 7-day-PPA; nicotine dependence; number of cigarettes	**Barriers:** Changing providers' practices is a lengthy process **Enablers:** Repeated opportunities for quit engagement with participants **Implications:** Study showed that with support from their treatment service, smokers in the intervention group significantly reduced the number of cigarettes smoked.

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					smoked per day; self-reported quit attempts in the last 6 weeks/6 months; and self-reported offer and use of NRT were collected at client 8-week and 6.5-month follow-ups Significantly lower mean CPD were observed in the intervention participants at 8 weeks, although this lost significance at 6.5 months CPD UC: 16 (11) Int.:15 (11) Crude 95%CI 0.89 (0.8, 1.0) p-value 0.036	These findings indicate that smoking cessation care can be successfully integrated into routine AOD service provision through an organisational change approach The findings were inconclusive regarding whether or not treatment effects were observed for number of quit attempts at either follow-up time-point
Carpenter 2020	RCT	**Outpatients** of primary care clinics	To compare the effects of NRT sampling (provision of NRT starter kits)	**Intervention:** Usual care + NRT: standard care plus take-home bag included 2-week supply of patches and	Primary outcome 7d PPA at 6 months: 12% (intx) vs 8%	**Enablers:** Pragmatic and minimalist approach: sampling

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
(US)		n=1245; overall gender split not reported; mean age 50.7yrs	plus standard care (SC), relative to SC alone, provided by primary care providers during routine clinic visits	lozenges, and handouts with minimal information on use. **Control:** Usual care; self-help materials in take-home bag (included brochure referral to quitline); Providers encouraged (not required) to provide explicit cessation advice	(control), aOR 1.7 (95%CI 1.1-2.6) **Uptake after brief int.:** use of any cessation medication in 6-month study period: 65% (intx) vs 25% (control), aOR 5.9 (95%CI 4.3-7.9)	intervention took only a few minutes to deliver, required no complicated instructions to either the patient or the provider and was easily embedded within the context of busy primary care practices
Zawertailo 2020 (Canada)	RCT	Inpatient and outpatients of addiction treatment centres n=31; 73% males; 27% females; mean age 44.6yrs	Assess safety and efficacy of varenicline compared with placebo in smokers undergoing treatment for alcohol dependence	**Intervention:** 12 weeks of varenicline in combination with weekly in-person individual cessation counselling (brief, manualised) *Varenicline treatment used standard dose escalation paradigm (0.5 mg once a day for the first 3 days; 0.5 mg twice a day for the next 4 days; then 1 mg twice a day for the next 11 weeks) **Control:** 12 weeks of placebo in combination with weekly in-person	Primary outcome: 4-week **prolonged abstinence** at end of treatment assessed via CO-verified 7d PPA at last four weekly visits: 43.8% (intx) vs 6.7% (control), x2=5.56, p=0.037 Secondary outcome: **abstinence** from smoking (zero CPD	**Implications:** Findings provide further evidence to support the use of varenicline as a safe and effective treatment option for smoking cessation in individuals with concurrent alcohol use disorder

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
				individual cessation counselling (brief, manualised)	or week) at 26 weeks post program enrolment: 12.5% (intx) vs 20% (control), x2=0.32, p=0.65	
Carson-Chahhoud 2020 (Australia)	RCT	Inpatient in hospital setting n=392; 67% males; 33% females; mean age 53.2yrs	To evaluate the long-term (104 week) efficacy following a standard course of inpatient-initiated varenicline tartrate plus quitline-counselling compared with quitline-counselling alone for inpatients admitted to hospital following an acute smoking-related illness	**Intervention:** 12 weeks of varenicline tartrate (administered orally at 0.5mg per day for the first three days, 0.5mg twice daily for 4 days, then 1mg twice daily thereafter) PLUS quitline counselling + self-help resource pack (same as control group) **Control:** Proactive quitline referral (or project officer made initial quitline contact at patient bedside) for counselling (5As approach; 8 x 5-10min calls over 12wks); plus self-help quit assistance resource pack	Primary outcome: Self-reported **continuous abstinence** (<=5 cigs) between weeks 2 and 104 (i.e. 2yr f/up): 29.2% (intx) vs 18.8% (control), OR 1.78 (95%CI 1.10–2.86), p=0.02	**Enablers:** Participants required to pay for varenicline; superior quit attempts in intervention group may be due to financial commitment made when purchasing the quit medication (economic principal of loss aversion) **Implications:** Authors suggest varenicline tartrate plus counselling be considered for

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
						standard practice among hospitalised smokers
Matuszewski 2021 (US)	RCT	**Inpatients** requiring orthopaedic surgery n=228; overall gender statistics not reported; mean age 42.6yrs	Assess the effectiveness of 2 smoking cessation interventions in the orthopaedic trauma population compared with usual standard of care: (1) brief inpatient counselling and (2) extended counselling defined as brief inpatient counselling coupled with frequent follow-up or sustained care	Brief counselling: brief (approx 10 minutes) inpatient smoking counselling (motivational strategies; 5As, 5Rs) within 24–72 hours of discharge and referral to a nationally based quitline Extended counselling: same as 'brief counselling' PLUS repeat follow-up (sustained care) by smoking counsellor at standard follow-up time points (2 weeks, 6 weeks, 3 months and 6 months) **Control:** Standard care; no dedicated counselling	CO-verified 7d PPA showed no differences for brief counselling vs control, or extended counselling vs control at 3 months [17% (control) vs 11% (brief counselling) vs 10% (extended counselling), (p=0.45, 0.37)] and 6 months [15% vs 10% vs 5%, (p = 0.45, 0.10)] **Uptake after brief int.** Extended counselling patients were 3 times more likely to accept referral to a quitline [OR, 3.1; 95%CI,	**Enablers:** (explanations for why control did so well) The potential influence of trauma as a life-changing event for orthopaedic patients. Simple education seems to be sufficient, producing a short-term effect in smoking cessation. Hawthorne effect, described as the change of behaviour of subjects based on the knowledge that they are being

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					1.4–6.9], and brief counselling patients were more than twice as likely to accept referral (OR, 2.3; 95% CI, 1.0–5.1) than the control group. Extended counselling (OR, 8.2; 95% CI, 1.0-68.5) and brief counselling (OR, 5.3; 95% CI, 0.6-44.9) patients were more likely to use quitline services than the control group	observed for that said behaviour **Implications:** Despite overall high rates of cessation in all groups, counselling did not seem to improve quit rates. There was a difference in successful quitline referral with a significant increase in successful acceptance of quitline. The referral and follow-up techniques used can be learnt and implemented by any healthcare providers

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
Brown 2021 (US)	RCT	Inpatients of psychiatric hospitals n=353; overall gender split not reported; mean age 35.8yrs	Examine the effectiveness of a multi-component sustained care (SusC) smoking cessation intervention in smokers with SMI receiving inpatient psychiatric care. We hypothesised that (1) SusC compared with usual care (UC) would result in significantly higher rates of validated 7-day point-prevalence abstinence (PPA) from tobacco at 6-month follow-up, and (2) a higher proportion of patients in the SusC vs the UC group would use evidence-based	**Intervention:** Usual care + 1) inpatient motivational counselling (40mins); 2) free transdermal nicotine patches on discharge; 3) an offer of free post-discharge telephone quitline, text-based, and/or web-based smoking cessation counselling, and 4) post-discharge automated interactive voice response calls or text messages **Control:** Usual care: brief (5–10mins) smoking cessation info and advice from admitting nurse; self-help materials; offer of NRT to use during stay	Primary outcome: **CO-verified 7-d PPA** at 6m: 8.9% (intx) v 3.5% (control); AOR 2.95 (95%CI 1.24-6.99); p=0.01 **Uptake after brief int.** Intx group more likely to report having used any smoking cessation treatment over the 6 months (cumulative) after discharge (74.6%vs 40.5%; RR, 1.8 [95% CI, 1.51–2.25];P< .001), including both counselling (37.3% vs 11.1%; RR, 3.39 [95% CI, 2.13–5.42];P< .001) and pharmacotherapy (71.0% vs 37.0%; RR, 1.92 [95%CI, 1.54–2.38];P< .001)	**Enablers:** Combining this inpatient MI session that promotes continued abstinence and acceptance of resources offered with automated, proactive resources, such as IVR, text messaging and other technology-assisted interventions, increases the likelihood of successful attempts at quitting

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
			smoking cessation treatment in the months after hospital discharge			
Buttery 2022 (UK)	RCT	**Outpatients** of a lung screening clinic n=412; 51.4% males; 48.6% females; mean age 62.1yrs	To determine if immediate smoking cessation support, including pharmacotherapy, offered as part of a lung cancer screening program, increases quit rates compared with usual care (very brief advice to quit and signposting to smoking cessation services)	**Intervention:** Those attending the TLHC were seen immediately by the smoking cessation service, with immediate access to pharmacological options to support quit attempts and 6 sessions of one-to-one cessation support. The sessions were informed by the National Centre for Smoking Cessation and Training (NCSCT) and KickIT programs. Each session would include a combination of motivational interviewing, behavioural support, and information about nicotine withdrawal alongside pharmacotherapy counselling and prescriptions. The prescriptions were provided free of charge. All sessions were conducted by a specialist research nurse and smoking cessation practitioner who was embedded into the HLP team	Self-reported 7-day point prevalence smoking abstinence at 3-months post enrolment INT: 14 (29.2%) vs CTL: 4 (11%) $\chi 2$ 3.98, p=0.04 Note: No ITT analysis, only one statement: A sensitivity analysis, assuming that all participants that we had been unable to follow up were still smoking, produced a similar result ($\chi 2$ 3.92, p=0.04)	

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
				Control: Those attending on UC days received very brief advice (VBA) to quit ("Stopping smoking is the most important thing that you can do to improve your health now and reduce the risk of health problems in the future.") The VBA approach was as outlined by the NCSCT. Participants were also directed to the London Stop Smoking Portal https://london.stopsmokingportal.com/ which provides information to smokers about how to engage with local stop smoking services and a telephone quitline service. Nurses administering the TLHC appointments provided both signposting and VBA		
King 2022 (US)	RCT	**Outpatients** of AOD services n=122; 55% males; 45% females; mean age 44yrs	To determine whether combined treatment with varenicline tartrate and nicotine patch improves continuous abstinence from cigarette smoking	**Intervention:** Varenicline and matching placebo tablets were provided by Pfizer. Participants were randomly assigned (1:1 via a random number generator) to receive either varenicline and nicotine patch (varenicline group) or placebo and nicotine patch (placebo group). Plus	**Smoking cessation** rates during weeks 9–12 were higher in the varenicline group than the placebo group (27 participants [44.3%] vs 17 participants [27.9%]; OR, 2.20;	**Implications:** Smokers who drink heavily can be enrolled and retained in smoking cessation clinical trials with good retention rates and

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
			among smokers who drink heavily	brief behavioural therapy during first 2 visits. **Control:** Placebo tablets and nicotine patch	95% CI, 1.01–4.80; p=.047) **Other outcomes:** Survival analysis of continuous abstinence during 12-week treatment confirmed lower likelihood of smoking relapse among those in the varenicline group compared with those in the placebo group (HR=0.62; 95% CI, 0.40–0.96;p= .03)	cessation outcomes
Webb 2022 (Australia)	RCT	Outpatients on elective surgery waitlists n=748; overall gender statistics not	To examine whether offering free mailed NRT and quitline referral to smokers on elective surgery waiting lists increased the proportion who quit	Both intervention and control groups were provided standard care (a brochure on smoking and surgery) **Intervention** group smokers also received a printed offer of free mailed NRT and quitline support, and a study-specific brochure on the risks of low-frequency smoking (fewer than 10	**Quit rate:** CO-confirmed proportion of smokers who quit at least 24 hours before surgery: more likely for intervention group participants (18%) than control	

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
		reported; mean age 49.8yrs	smoking before surgery	cigarettes per day) was mailed to light or intermittent smokers **Control:** No further intervention	(9%) ;(OR, 2.05; 95% CI, 1.32–3.17) **Other outcomes:** CO-confirmed quitting four or more weeks prior to surgery: more likely for intervention participants (9%) than control (4%); (OR, 2.20; 95% CI, 1.08–4.50) Successful quit attempts during waiting period: more likely for intervention participants (34%) than control participants (22%); (R, 1.56; 95% CI 1.17–2.09) Abstinence three months after surgery: 9 of the 83	

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					participants who had quit at least 24 hours before surgery (47%) reported they had not smoked in the preceding seven days (intervention, 27 of 58 [47%]; control, 12 of 25 [48%]). **Uptake after brief int.** Cessation medication use during the waiting period: 29 people in the control group (12%) and 95 in the intervention group (35%)	
Bernstein 2023 (US)	RCT	**Outpatients** of hospital trauma centres/ED	To identify components of an ED-initiated intervention that are optimally effective	**Intervention:** -Brief negotiation interview (brief adaption of motivational interviewing): manual-guided, delivered by trained staff member -NRT: provision of 6w of patches (42	Biochemically verified 7d **cessation** (at 3 months; assessed by self-report and confirmatory exhaled	**Implications:** The brief negotiation interview and provision of NRT were individually efficacious. These

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
		n=1056; 49% males; median age 43.3yrs	for treating adult smokers	counts) and gum (300 pieces of 2mg) to participant, with the application of the first patch by an ED nurse at the ED index visit. Dosing was tailored to participants' cigarette consumption and a research assistant conducted a brief educational session with the participant on using both the patch and the gum -Quitline: active referral to the state quitline. Participants who enrolled in multiple call or web-based program also eligible for 2w of NRT from quitline -Texting: enrolment in the SmokefreeTXT short-messaging service texting program for mobile phones, (provides 24/7 encouragement, advice, and tips to quit and stay quit) **Control:** All participants received a state-produced smoking cessation brochure that reviewed the health hazards of smoking and included the quitline phone number. Full factorial design.	CO): brief negotiation interview (13.5% vs 8.9%: aOR, 95% CI = 1.8 [1.1, 2.8]) and NRT (14.4% vs 8.0%: aOR, 95% CI = 2.1 [1.3, 3.2]) were associated with increased abstinence. Quitline (12.4% vs 10.1%: aOR, 95% CI = 1.4 [0.9, 2.2]) and texting (11.6% vs 10.8%: aOR, 95% CI = 1.1 [0.7, 1.7]) were not significantly associated with increased abstinence **Other outcomes**; Self-reported abstinence at 1 month: NRT (17.8% vs 9.3%: OR, 95% CI = 2.1 [1.5, 3.1]) and texting (18.4%	two interventions were identified as effective and reaffirmed the ability of ED-initiated tobacco dependence treatment to help low-income smokers achieve abstinence

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					vs 8.7%: OR, 95% CI = 2.4 [1.6, 3.4]) associated with an increased odds of abstinence. Brief negotiation interview (12.3% vs 14.8%: OR, 95% CI = 0.8 [0.6, 1.2]) and quitline (14.0% vs 13.1%: OR, 95% CI = 1.1 [0.8, 1.5]) were not significantly associated. Self-reported abstinence at 3 months: NRT (22.0% vs 15.8%: OR, 95% CI = 1.5 [1.1, 2.1]) and texting (21.4% vs 16.4%: OR, 95% CI = 1.5 [1.1, 2.1]) associated with an increased odds of abstinence. Brief negotiation interview (20.1% vs 17.7%: OR, 95% CI = 1.2	

Author, year (Country)	Study design Level of Evidence	Setting Population Sample	Aim	Intervention	Results	Barriers Enablers Implications
					[0.9, 1.7]) and quitline (20.2% vs 17.7%: OR, 95% CI = 1.2 [0.9, 1.7]) were not significantly associated	

Appendix 6—Overview of evidence from systematic reviews

Twenty-seven systematic reviews were included in this Evidence Check, 25 of them Cochrane reviews. Here we provide a high-level summary of the evidence from 17 systematic reviews covering interventions relevant to both parts of Question 1. The other 10 reviews are referred to where relevant to specific areas throughout the results section. It should be noted that while Cochrane reviews published from 2013 onwards have been included, the reviews themselves contain studies published prior to 2013. Further to this the Cochrane reviews included are not limited to the healthcare setting but rather provide the best available evidence about the interventions.

Combined pharmacotherapy and behavioural interventions

Two Cochrane reviews (Stead 2016; Hartmann-Boyce 2021) assessed the evidence for combining pharmacotherapy with behavioural support to help people stop tobacco smoking. Stead et al. compared interventions combining any type of NRT, bupropion, nortriptyline or varencline with behavioural support for tobacco smoking cessation to a usual care or brief advice or less intensive behavioural support control. Fifty-three studies with more than 25,000 participants were identified overall, most recruited in healthcare settings, and provided NRT and behavioural support consisting of cessation counselling offered by specialists over 4–8 contact sessions. Combining pharmacotherapy and behavioural support increases tobacco smoking cessation success compared with a minimal intervention or usual care. Hartmann-Boyce et al. (2021) evaluated the effect of adding or increasing the intensity of behavioural support for people using cessation medications. There is high-certainty evidence that adding behavioural support (in person or via telephone) to pharmacotherapy use increases quit rates, and that increasing the amount of behavioural support is likely to increase the chance of success by 10%–20% (based on a pooled estimate from 65 trials).

Pharmacotherapy

One non-Cochrane systematic review (with network meta-analyses) analysed the effectiveness of tobacco smoking cessation medications (Shang 2022). The review concluded most monotherapies and combination treatments are more effective than placebo at achieving abstinence.

The evidence for specific pharmacotherapies outlined below is based on Cochrane review findings.

Varenicline. In the Cochrane review (Livingstone-Banks, 2023) that assessed the effectiveness of varenicline vs placebo on quit rates, varenicline was shown to increase the odds of successful long-term cessation between two- and three-fold (the most recent reporting this as high-certainty evidence**).** More participants quit successfully with varenicline than with bupropion or NRT (again, the most recent review reported this as high-certainty evidence**)**, and it may also assist in relapse prevention. More research is needed to address whether varenicline increases cardiovascular events in people already at increased risk of those illnesses.

NRT. (Hartmann-Boyce, 2018; Lindson 2019**)** Hartmann-Boyce (2018) identified 133 studies (64,640 participants overall) contributing data to the primary comparison between any type of NRT (gum, transdermal patch, intranasal spray and inhaled and oral preparations) and a placebo or non-NRT

group to determine effectiveness and safety. There is high-certainty evidence that all the licensed forms of NRT can help increase chances of success for a quit attempt by a rate of 50%–60% regardless of setting. Further to these conclusions, Lindson (2019) assessed different forms, deliveries, doses, durations and schedules of NRT for achieving long-term cessation. From 63 trials (41,509 participants), there is high-certainty evidence that cNRT vs single-form NRT increases quit success. People using higher doses of patches and gum are also more likely to quit successfully than those using lower doses. Using NRT before quit day shows promise, and people have the same chance of quitting successfully when using a patch as any of the other fast-acting types of NRT. More research is required to provide recommendations on duration and schedules of use.

Bupropion. Hajizadeh et al. assessed 1234 studies (48,832 participants overall) and concluded there was no clear justification for pursuing bupropion for tobacco smoking cessation over other licensed tobacco smoking cessation treatment, namely NRT and varenicline. Although bupropion can support long-term tobacco smoking cessation it may result in increased SAEs and people are more likely to discontinue treatment due to unpleasant side effects compared with placebo or pharmacological treatment. While bupropion may be as successful as single-form NRT, it is less effective than cNRT and varenicline in helping people to quit tobacco smoking.

Cytisine. A Cochrane review found moderate-certainty evidence (limited by heterogeneity) that cytisine helps more people to quit smoking than placebo (Livingstone-Banks 2023). Further research on regimens and supplementary behavioural support are required.

Opioid antagonists (e.g. naltrexone). Based on data from eight trials and more than 1200 individuals, there was no evidence of an effect of naltrexone alone or as an adjunct to NRT on long-term tobacco smoking abstinence, with a point estimate strongly suggesting no effect and confidence intervals that make a clinically important effect of treatment unlikely (David et al. 2013).

Behavioural interventions

In an overview of reviews, Hartmann-Boyce et al. (2021) summarised the evidence from 33 Cochrane reviews, concluding behavioural support for tobacco smoking cessation can increase quit rates at six months or longer, with no evidence that support increases harms. The effect remains whether or not pharmacotherapy is also provided.

Individual behavioural counselling. (Lancaster 2017**)** There is high-certainty evidence that individual counselling is more effective than a minimal contact control (brief advice, usual care or provision of self-help materials) to assist smokers to quit. There is moderate-certainty evidence of a benefit when counselling is used in addition to pharmacotherapy (NRT).

Motivational interviewing. (Lindson 2019**)** Based on data from 37 studies (15,000 participants) there is insufficient evidence to determine whether or not motivational interviewing (MI) helps people to stop tobacco smoking compared with no intervention, as an addition to other types of behavioural tobacco smoking cessation support, or compared with other types of behavioural support for cessation.

Medical practitioner advice. (Stead 2013**)** Simple advice (brief intervention) from a healthcare practitioner has a small effect on cessation rates (i.e. assuming unassisted quit rate of 2%–3%, medical practitioner advice can increase quitting by further 1%–3%). There is some evidence of a small additional benefit of more intensive interventions vs very brief ones. It should be noted this review is based on evidence from 42 trials conducted between 1972 and 2012.

Telephone counselling. (Matkin 2019**)** There is moderate-certainty evidence that proactive telephone counselling aids smokers who seek help from quitlines and increases quit rates in smokers in other settings. More evidence is needed to draw conclusions about differences in number of contacts, type or timing of telephone counselling, or when it is provided as an adjunct to other cessation therapies.

Print-based self-help materials. (Livingstone-Banks 2019**)** Moderate-certainty evidence shows that when no other support is available, written self-help materials help more people to stop tobacco smoking than no intervention. Although further small benefits cannot be excluded, the review did not find evidence to show that when people receive advice from a health professional or are using NRT, that self-help materials add to their effect.

Mobile text messaging and app-based interventions. (Whittaker 2019**)** The review included 26 studies (33,849 participants). There is moderate-certainty evidence that automated text message-based tobacco smoking cessation interventions result in greater quit rates than minimal tobacco smoking cessation support, and evidence of benefit when added to other tobacco smoking cessation supports. More evidence is needed on use of smartphone apps.

Table A6.1—Data extraction table: summary of included systematic reviews

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
Apollonio et al. 2016 **Interventions for tobacco use cessation in people in treatment for or recovery from substance use disorders** (Cochrane review)	To evaluate whether interventions for tobacco cessation are associated with tobacco abstinence for people in concurrent treatment for or in recovery from alcohol and other drug dependence	Tobacco cessation therapy that includes pharmacotherapy appears to be associated with increased tobacco abstinence for participants diagnosed with alcohol and other drug dependence, although the quality of evidence supporting these findings was low Participation in tobacco cessation therapy does not appear to influence the success of treatments for alcohol and other drug dependence Further research on the effects of tobacco cessation interventions should focus on comparing specific interventions associated with tobacco abstinence Further study of counselling as tobacco cessation strategy needed, given the clinical heterogeneity of the interventions assessed in this review, which may have contributed to the finding that counselling was not associated with tobacco abstinence
Livingstone-Banks 2023 (Cochrane review; updated from 2007 review) **Nicotine receptor partial agonists for smoking cessation**	To review the efficacy of nicotine receptor partial agonists, including varenicline and cytisine, for smoking cessation	Cytisine increases the chances of quitting, although absolute quit rates were modest in two recent trials Varenicline at standard dose increased the chances of successful long-term smoking cessation between two- and three-fold compared with pharmacologically unassisted quit attempts. Lower dose regimens also conferred benefits for cessation, while reducing the incidence of adverse events More participants quit successfully with varenicline than with bupropion or nicotine replacement therapy (NRT)

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
		Limited evidence suggests varenicline may have a role to play in relapse prevention. The most frequently recorded adverse effect of varenicline is nausea, but mostly at mild to moderate levels and tending to subside over time. Early reports of possible links to suicidal ideation and behaviour have not been confirmed by current research Future trials of cytisine may test extended regimens and more intensive behavioural support
Carson-Chahhoud et al. 2019 (Cochrane review; updated from 2008 review) **Community pharmacy personnel interventions for smoking cessation**	To assess the effectiveness of interventions delivered by community pharmacy personnel to assist people to stop smoking, with or without concurrent use of pharmacotherapy	Community pharmacists can provide effective behavioural support to people trying to stop smoking. However, this conclusion is based on low-certainty evidence, limited by risk of bias and imprecision. Further research could change this conclusion
Chamberlain et al. 2017 (Cochrane review; updated from 2013 review) **Psychosocial interventions for supporting women to**	Evaluated the effect of psychosocial interventions designed to support women to stop smoking in pregnancy and address the following (primary) objectives: • To identify whether psychosocial interventions can support women to stop smoking in pregnancy	Psychosocial interventions to support women to stop smoking in pregnancy can increase the proportion of women who stop smoking in late pregnancy and the proportion of infants born low birthweight Counselling, feedback and incentives appear to be effective; however the characteristics and context of the interventions should be carefully considered

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
stop smoking in pregnancy	• To compare the effectiveness of the main psychosocial intervention strategies in supporting women to stop smoking in pregnancy (i.e. counselling, health education, feedback, social support, incentives, exercise)	The effect of health education and social support is less clear. New trials have been published during the preparation of this review and will be included in the next update
Claire et al. 2020 (Cochrane review; updated from 2015 review) **Pharmacological interventions for promoting smoking cessation during pregnancy**	To determine the efficacy and safety of smoking cessation pharmacotherapies and electronic cigarettes (ECs) used during pregnancy for smoking cessation in later pregnancy and after childbirth, and to determine adherence to smoking cessation pharmacotherapies and ECs for smoking cessation during pregnancy	NRT used for smoking cessation in pregnancy may increase smoking cessation rates in late pregnancy. However, this evidence is of low certainty, as the effect was not evident when potentially biased, non-placebo-controlled RCTs were excluded from the analysis. Future studies may therefore change this conclusion No evidence that NRT has either positive or negative impacts on birth outcomes; however, the evidence for some of these outcomes was also judged to be of low certainty due to imprecision and inconsistency No evidence that bupropion may be an effective aid for smoking cessation during pregnancy, and there was little evidence evaluating its safety in this population Further research evidence on the efficacy and safety of pharmacotherapy and EC use for smoking cessation in pregnancy is needed, ideally from placebo-controlled RCTs that achieve higher adherence rates and that monitor infants' outcomes into childhood. Future RCTs of NRT should investigate higher doses than those tested in the studies included in this review
Hartmann-Boyce et al. 2019 (Cochrane review; updated from 2012 review)	To evaluate the effect of adding or increasing the intensity of behavioural support for people using smoking cessation medications, and to assess whether there are different effects	There is high-certainty evidence that providing behavioural support in person or via telephone for people using pharmacotherapy to stop smoking increases quit rates Increasing the amount of behavioural support is likely to increase the chance of success by about 10%–20%, based on a pooled estimate from 65 trials. Subgroup

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
Additional behavioural support as an adjunct to pharmacotherapy for smoking cessation	depending on the type of pharmacotherapy, or the amount of support in each condition. Examine studies that directly compare behavioural interventions matched for contact time, where pharmacotherapy is provided to both groups (e.g. tests of different components or approaches to behavioural support as an adjunct to pharmacotherapy)	analysis suggests the incremental benefit from more support is similar over a range of levels of baseline support. More research is needed to assess the effectiveness of specific components that comprise behavioural support
Hartmann-Boyce et al. 2021 **Behavioural interventions for smoking cessation: an overview and network meta-analysis** (Cochrane review)	To summarise the evidence from Cochrane reviews that assessed the effect of behavioural interventions designed to support smoking cessation attempts and to conduct a network meta-analysis to determine how modes of delivery; person delivering the intervention; and the nature, focus and intensity of behavioural interventions for smoking cessation influence the likelihood of achieving abstinence six months after attempting to stop smoking; and whether the effects of behavioural interventions depend on other characteristics, including population, setting and the provision of pharmacotherapy To summarise the availability and principal findings of economic evaluations of behavioural interventions for smoking cessation, in terms of	Behavioural support for smoking cessation can increase quit rates at six months or longer, with no evidence that support increases harms. This is the case with or without provision of smoking cessation pharmacotherapy, but the effect is slightly more pronounced in the absence of pharmacotherapy Evidence of benefit is strongest for the provision of any form of counselling and guaranteed financial incentives Evidence suggested possible benefit but the need for further studies to evaluate: individual tailoring; delivery via text message, email and audio recording; delivery by lay health adviser; and intervention content with motivational components and a focus on how to quit 23 economic evaluations were identified: the evidence did not consistently suggest one type of behavioural intervention for smoking cessation was more cost-effective than another Future reviews should fully consider publication bias. Tools to investigate publication bias and to evaluate certainty in CNMA are needed

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
	comparative costs and cost-effectiveness, in the form of a brief economic commentary	
Holliday et al. 2021 (Cochrane review; updated from 2006 review) **Interventions for tobacco cessation delivered by dental professionals**	To assess the effectiveness, adverse events and oral health effects of tobacco cessation interventions offered by dental professionals	There is very low-certainty evidence that quit rates increase when dental professionals offer behavioural support to promote tobacco cessation. There is moderate-certainty evidence that tobacco abstinence rates increase in cigarette smokers if dental professionals offer behavioural support combined with pharmacotherapy Further evidence is required to be certain of the size of the benefit and whether adding pharmacological interventions is more effective than behavioural support alone. Future studies should use biochemical validation of abstinence to preclude the risk of detection bias There is insufficient evidence as to whether these interventions lead to adverse effects, but no reasons to suspect that these effects would be specific to interventions delivered by dental professionals There was insufficient evidence that interventions affected oral health
Lancaster et al. 2017 (Cochrane review; updated from 1999 review) **Individual behavioural counselling for smoking cessation**	The review addresses the following hypotheses: 1. Individual counselling is more effective than no treatment or brief advice in promoting smoking cessation 2. Individual counselling is more effective than self-help materials in promoting smoking cessation	There is high-quality evidence that individually delivered smoking cessation counselling can assist smokers to quit There is moderate-quality evidence of a smaller relative benefit when counselling is used in addition to pharmacotherapy, and of more intensive counselling compared with a brief counselling intervention

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
	3. A more intensive counselling intervention is more effective than a less intensive intervention	
Lindson-Hawley et al. 2019 (Cochrane review; updated from 2010 review) **Motivational interviewing for smoking cessation**	To evaluate the efficacy of MI for smoking cessation compared with no treatment, in addition to another form of smoking cessation treatment, and compared with other types of smoking cessation treatment Investigated whether more intensive MI is more effective than less intensive MI for smoking cessation Explored whether motivational interviewing for smoking cessation could enhance wellbeing	There is insufficient evidence to show whether MI helps people to stop smoking compared with no intervention, as an addition to other types of behavioural support for smoking cessation or compared with other types of behavioural support for smoking cessation It is also unclear whether more intensive MI is more effective than less intensive MI. All estimates of treatment effect were of low certainty because of concerns about bias in the trials, imprecision and inconsistency. Consequently, future trials are likely to change these conclusions There is almost no evidence as to whether MI for smoking cessation improves mental wellbeing
Lindson et al. 2019 **Different doses, durations and modes of delivery of nicotine replacement therapy for smoking cessation** (Cochrane review)	To determine the effectiveness and safety of different forms, deliveries, doses, durations and schedules of nicotine replacement therapy (NRT) for achieving long-term smoking cessation, compared with one another	There is high-certainty evidence that using combination NRT vs single-form NRT, and 4 mg vs 2 mg nicotine gum, can increase the chances of successfully stopping smoking For patch dose comparisons, evidence was of moderate certainty, due to imprecision. Twenty-one mg patches resulted in higher quit rates than 14 mg (24-hour) patches and using 25 mg patches resulted in higher quit rates than using 15 mg (16-hour) patches, although in the latter case the CI included one. There was no clear evidence of superiority for 42/44 mg over 21/22 mg (24-hour) patches Using a fast-acting form of NRT, such as gum or lozenge, resulted in similar quit rates to nicotine patches

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
		There is moderate-certainty evidence that using NRT prior to quitting may improve quit rates vs using it from quit date only; however, further research is needed to ensure the robustness of this finding Evidence for the comparative safety and tolerability of different types of NRT use is of low and very low certainty. New studies should ensure that AEs, SAEs and withdrawals due to treatment are both measured and reported
Lindson et al. 2021 **Strategies to improve smoking cessation rates in primary care**	To assess the effectiveness of strategies intended to increase the success of smoking cessation interventions in primary care settings. To assess whether any effect that these interventions have on smoking cessation may be due to increased implementation by healthcare providers	There is moderate-certainty evidence that providing adjunctive counselling by an allied health professional, cost-free smoking cessation medications and tailored printed materials as part of smoking cessation support in primary care can increase the number of people who achieve smoking cessation There is no clear evidence that providing participants with biomedical risk feedback, or primary care providers with training or incentives to provide smoking cessation support enhance quit rates. However, the evidence was rated as of low or very low certainty, and so conclusions are likely to change as further evidence becomes available Most of the studies in this review evaluated smoking cessation interventions that had already been extensively tested in the general population. Further studies should assess strategies designed to optimise the delivery of those interventions already known to be effective within the primary care setting. Such studies should be cluster-randomised to account for the implications of implementation in this particular setting Due to substantial variation among studies in this review, identifying optimal characteristics of multi-component interventions to improve the delivery of smoking

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
		cessation treatment was challenging. Future research could use component network meta-analysis to investigate this further
Matkin et al, 2019 (Cochrane review; updated from 2013 review) **Telephone counselling for smoking cessation**	To evaluate the effect of telephone support to help smokers quit, including proactive or reactive counselling, or the provision of other information to smokers calling a helpline	There is moderate-certainty evidence that proactive telephone counselling aids smokers who seek help from quitlines, and moderate-certainty evidence that proactive telephone counselling increases quit rates in smokers in other settings There is currently insufficient evidence to assess potential variations in effect from differences in the number of contacts, type or timing of telephone counselling, or when telephone counselling is provided as an adjunct to other smoking cessation therapies Evidence was inconclusive as to the effect of reactive telephone counselling, due to a limited number of studies, which reflects the difficulty of studying this intervention
Shang et al. 2022 **Pharmacological interventions for smoking cessation: A systematic review and network meta-analysis** (systematic review, network meta-analysis; *Frontiers in Pharmacology*)	To investigate the effects of pharmacological interventions on smoking cessation In this network meta-analysis, the purpose is to include all randomised controlled trials of pharmacotherapy for smoking cessation, comprehensively compare the differences in abstinence effects of different pharmacological interventions and seek the best intervention, to provide reference for clinical smoking cessation practice	Network meta-analysis showed varenicline was more helpful for smoking cessation than other monotherapies, such as nicotine replacement therapy (NRT) and bupropion Combined interventions were superior to monotherapy in achieving smoking cessation, such as varenicline plus bupropion over bupropion, varenicline plus NRT over NRT, and NRT plus mecamylamine over naltrexone NRT plus mecamylamine had the greatest probability of becoming the best intervention

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
Stead et al. 2016 (Cochrane review; updated from 2012 review.) **Combined pharmacotherapy and behavioural interventions for smoking cessation**	To assess the effect of combining behavioural support and medication to aid smoking cessation, compared with a minimal intervention or usual care, and to identify whether there are different effects depending on characteristics of the treatment setting, intervention, population treated or take-up of treatment	Interventions that combine pharmacotherapy and behavioural support increase smoking cessation success compared with a minimal intervention or usual care Updating this review with an additional 12 studies (5000 participants) did not materially change the effect estimate Although trials differed in the details of their populations and interventions, recruitment setting was the only factor that modified treatment effects No evidence from indirect comparisons that offering more intensive behavioural support was associated with larger treatment effects
Thomas et al. 2017 **System change interventions for smoking cessation** (Cochrane review)	To assess the effectiveness of system change interventions within healthcare settings for increasing smoking cessation or the provision of smoking cessation care, or both	Available evidence suggests system change interventions for smoking cessation may not be effective in achieving increased cessation rates, but have been shown to improve process outcomes, such as documentation of smoking status, provision of cessation counselling and referral to smoking cessation services Limited available research, hence unable to draw strong conclusions. Indicates a need for additional high-quality research to explore the impact of system change interventions on both cessation and system-level outcomes “As yet there is also no evidence for hospital-based system change interventions for inpatient smokers, which is a deficit to be addressed by future research”
Thomsen et al. 2014 (Cochrane review; updated from 2010 review)	The objectives of this review are to assess the effect of preoperative smoking intervention on smoking cessation at the time of surgery and 12	Evidence that preoperative smoking interventions providing behavioural support and offering NRT increase short-term smoking cessation and may reduce postoperative morbidity. One trial of varenicline begun shortly before surgery has

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
Interventions for preoperative smoking cessation	months postoperatively, and on the incidence of postoperative complications	shown a benefit for long-term cessation but did not detect an effect on early abstinence or on postoperative complications The optimal preoperative intervention intensity remains unknown. Based on indirect comparisons and evidence from two small trials, interventions that begin 4–8 weeks before surgery, include weekly counselling and use NRT are more likely to have an impact on complications and on long-term smoking cessation
Cahill et al. 2013 *(*Cochrane review; *2022 protocol available, update due soon)* **Pharmacological interventions for smoking cessation: an overview and network meta-analysis**	How do NRT, bupropion and varenicline compare with placebo and with each other in achieving long-term abstinence (six months or longer)? How do the remaining treatments compare with placebo in achieving long-term abstinence? How do the risks of adverse and serious adverse events (SAEs) compare between the treatments, and are there instances where the harms may outweigh the benefits?	NRT, bupropion, varenicline and cytisine have been shown to improve the chances of quitting. Combination NRT and varenicline are equally effective as quitting aids. Nortriptyline also improves the chances of quitting On current evidence, none of the treatments appear to have an incidence of adverse events that would mitigate their use Further research is warranted into the safety of varenicline and into cytisine's potential as an effective and affordable treatment, but not into the efficacy and safety of NRT
David et al. 2013 (Cochrane review)	To evaluate the efficacy of opioid antagonists in promoting long-term smoking cessation. The	Based on data from eight trials and more than 1200 individuals, there was no evidence of an effect of naltrexone alone or as an adjunct to NRT on long-term

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
Opioid antagonists for smoking cessation	drugs include naloxone and the longer-acting opioid antagonist naltrexone	smoking abstinence, with a point estimate strongly suggesting no effect and confidence intervals that make a clinically important effect of treatment unlikely Although further trials might narrow the confidence intervals they are unlikely to be a good use of resources
Hartmann-Boyce et al. 2018 **Nicotine replacement therapy vs control for smoking cessation**	To determine the effectiveness and safety of nicotine replacement therapy (NRT), including gum, transdermal patch, intranasal spray and inhaled and oral preparations, for achieving long-term smoking cessation, compared with placebo or 'no NRT' interventions	There is high-quality evidence that all the licensed forms of NRT (gum, transdermal patch, nasal spray, inhalator and sublingual tablets/lozenges) can help people who make a quit attempt to increase their chances of successfully stopping smoking. NRTs increase the rate of quitting by 50%–60%, regardless of setting, and further research is very unlikely to change our confidence in the estimate of the effect The relative effectiveness of NRT appears to be largely independent of the intensity of additional support provided to the individual Provision of more intense levels of support, although beneficial in facilitating the likelihood of quitting, is not essential to the success of NRT NRT often causes minor irritation of the site through which it is administered, and in rare cases can cause non-ischaemic chest pain and palpitations
Hajizadeh et al. 2023 (Cochrane review; updated from Howes et al. 2020 review) **Antidepressants for smoking cessation**	To assess the evidence for the efficacy, harms and tolerability of medications with antidepressant properties in assisting long-term tobacco smoking cessation in people who smoke cigarettes	There is high-certainty evidence that bupropion can aid long-term smoking cessation. However, bupropion may increase SAEs (moderate-certainty evidence when compared with placebo/no pharmacological treatment) There is high-certainty evidence that people taking bupropion are more likely to discontinue treatment compared with people receiving placebo or no pharmacological treatment.

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
		Nortriptyline also appears to have a beneficial effect on smoking quit rates relative to placebo, although bupropion may be more effective Evidence also suggests that bupropion may be as successful as single-form NRT in helping people to quit smoking, but less effective than combination NRT and varenicline In most cases, a paucity of data made it difficult to draw conclusions regarding harms and tolerability Further studies investigating the efficacy of bupropion vs placebo are unlikely to change our interpretation of the effect, providing no clear justification for pursuing bupropion for smoking cessation over other licensed smoking cessation treatments, namely NRT and varenicline. However, it is important that future studies of antidepressants for smoking cessation measure and report on harms and tolerability
Livingstone-Banks et al. 2019 (Cochrane review) **Print-based self-help interventions for smoking cessation**	To determine the effectiveness of different forms of print-based self-help materials that provide a structured program for smokers to follow, compared with no treatment and with other minimal contact strategies, and to determine the comparative effectiveness of different components and characteristics of print-based self-help, such as computer-generated feedback, additional materials, tailoring of materials to individuals and targeting of materials to specific groups	Moderate-certainty evidence shows that when no other support is available, written self-help materials help more people to stop smoking than no intervention When people receive advice from a health professional or are using nicotine replacement therapy, there is no evidence that self-help materials add to their effect. However, small benefits cannot be excluded Moderate-certainty evidence shows self-help materials that use data from participants to tailor the nature of the advice or support given are more effective than no intervention

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
		However, when tailored self-help materials, which typically involve repeated assessment and mailing, were compared with untailored materials delivered similarly, there was no evidence of benefit Available evidence tested self-help interventions in high-income countries, where more intensive support is often available. Further research is needed to investigate effects of these interventions in low- and middle-income countries, where more intensive support may not be available
Stead et al. 2013 **Physician advice for smoking cessation**	To assess the effectiveness of advice from physicians in promoting smoking cessation To compare minimal interventions by physicians with more intensive interventions To assess the effectiveness of various aids to advice in promoting smoking cessation To determine the effect of anti-smoking advice on disease-specific and all-cause mortality	Simple advice has a small effect on cessation rates Assuming an unassisted quit rate of 2%–3%, a brief advice intervention can increase quitting by a further 1%–3% Additional components appear to have only a small effect, though there is a small additional benefit of more intensive interventions compared with very brief interventions Only one study determined the effect of smoking advice on mortality. This study found no statistically significant differences in death rates at 20 years follow-up
Tsoi et al. 2013 **Interventions for smoking cessation and reduction in individuals with schizophrenia**	The objectives of the review were: To evaluate the benefits and harms of different treatments for nicotine dependence in schizophrenia	Bupropion increases smoking abstinence rates in smokers with schizophrenia, without jeopardising their mental state Varenicline may also improve smoking cessation rates in schizophrenia, but possible psychiatric adverse effects cannot be ruled out Contingent reinforcement (CR) may help this group of patients to quit and reduce smoking in the short term

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
		We failed to find convincing evidence that other interventions have a beneficial effect on smoking in schizophrenia
van der Meer et al. 2013 **Smoking cessation interventions for smokers with current or past depression** (Cochrane review)	The objectives of the review were: To evaluate the effectiveness of smoking cessation interventions, with and without specific mood management components, in smokers with current or past depression	Evidence suggests adding a psychosocial mood management component to a standard smoking cessation intervention increases long-term cessation rates in smokers with both current and past depression when compared with the standard intervention alone Pooled results from four trials suggest use of bupropion may increase long-term cessation in smokers with past depression. There was no evidence found for the use of bupropion in smokers with current depression There was not enough evidence to evaluate the effectiveness of the other antidepressants in smokers with current or past depression. There was also not enough evidence to evaluate the group of trials that investigated interventions without specific mood management components for depression, including NRT and psychosocial interventions
Whittaker et al. 2019 **Mobile phone text messaging and app-based interventions for smoking cessation** (Cochrane review)	The objectives of the review were: To determine whether mobile phone-based smoking cessation interventions increase smoking cessation rates in people who smoke	There is moderate-certainty evidence that automated text message-based smoking cessation interventions result in greater quit rates than minimal smoking cessation support There is moderate-certainty evidence of the benefit of text messaging interventions in addition to other smoking cessation support in comparison with that smoking cessation support alone

Author, year (Cochrane review)	Aim(s) of the review	Major finding(s)
		The evidence comparing smartphone apps with less intensive support was of very low certainty, and more randomised controlled trials are needed to test these interventions
Shoesmith et al. 2021 **Supporting smoking cessation and preventing relapse following a stay in a smoke-free setting: a meta-analysis and investigation of effective behaviour change techniques**	To identify the interventions that maintain abstinence following a smoke-free stay and determine their effectiveness as well as the probable effectiveness of behavioural change techniques (BCT) used	12 BCTs identified as promising for probable effectiveness of continued abstinence; however, due to insufficient information of BCTs in the studies, the most effective could not be identified There is promising evidence (i.e. continued abstinence) supporting probable effectiveness and feasibility when BCT interventions included social support and/or intention/goal setting and action planning Evidence also supported education, counselling and pharmacological support including remote delivery for effective continued abstinence

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