Smoking cessation in Secondary Care

Review 3 (Component 1)

Smoking cessation interventions in acute and maternity services:

Review of Barriers and Facilitators

Report to National Institute for Health and Clinical Excellence

Final Draft

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November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209. The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews. See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

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List of abbreviations

AAA	Ask, Advise, Act
AAAAA or 5As	Ask, Advise, Assess, Assist, Arrange
ABC	Ask, Brief Advice, Cessation Support
CABG/S	Coronary Artery Bypass Graft/Surgery
CAD	Coronary Artery Disease
CBT	Cognitive Behavioural Therapy
CCU	Coronary Care Unit
CHD	Coronary Heart Disease
CHF	Congestive Heart Failure
CI	Confidence Interval
CO	Carbon Monoxide
COHb	Carboxyhaemoglobin
COPD	Chronic Obstructive Pulmonary Disease
CVD	Cardiovascular Disease
ED	Emergency Department
EDD	Estimated date of delivery
FTND	Fagerstrom Test for Nicotine Dependence
FU	Follow-up
HCP	Health Care Professionals
HV	Health Visitor

ICU	Intensive Care Unit
ITT	Intention to treat
MI	Myocardial Infarction
MW	Midwife
NRT	Nicotine Replacement Therapy
O&G	Obstetrics and Gynaecology
OR	Odds Ratio
PCT	Primary Care Trust
PP	Point Prevalence
PVD	Peripheral Vascular Disease
RCT	Randomised Controlled Trial
RR	Relative Risk
SC	Smoking cessation
SOC	Stage of Change
SSS	Stop Smoking Services
TQD	Target Quit Date
TTM	Transtheoretical Model

Glossary

Throughout the document, ‘brief advice’ is contrasted with more intensive stop smoking interventions. Brief advice normally involves recommending that the patient stops smoking, with the recommendation supported by information on health risks of smoking. This can be supplemented by written materials and tips and advice on smoking cessation. More intensive interventions involve repeated contacts set up specifically to assist patients with smoking cessation.

Executive Summary

Introduction

Smoking cessation counseling and medications delivered in an acute hospital setting, combined with follow-up support after discharge, increase smoking cessation rates (NICE Review 2). Similarly, extended multi-session interventions aimed at helping pregnant women to stop smoking are effective (NICE Review 2). In contrast with the high intensity interventions, brief one-off interventions which can be delivered with minimal costs and which would be easier to implement on a large scale are of limited or no efficacy (NICE review 2).

Despite strong evidence of the effectiveness of intensive interventions and the availability of NHS specialist stop-smoking services funded to provide them, such interventions are far from universal. There seems to be a number of barriers to providing help to smokers in both acute and maternity care.

This review was set up to answer the following two questions posed by NICE:

1. How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation?
2. What barriers and facilitators affect the delivery of effective interventions?

Methodology

We systematically searched reviews and trials published between 1990 and December 2011 in English, but we also included literature published in early 2012 identified as relevant while work on the review was underway. The search terms and databases searched can be found in the review protocol in Appendix 1.

Search results

Searches of the databases returned 29083 records. A total of 163 papers were identified for full text retrieval.

Classifying papers included in the review

Papers were classified as:

1. **Studies (S)** – papers, which include original data.
2. **Discussions (D)** – papers which do not present any new data but consist of descriptions of current practice, discussions of issues, or reviews of or commentaries on other papers.

Applicability to the UK setting

Each paper was rated 1, 2 and 3 according to their relevance for informing UK practice (1=low relevance; 3=high relevance).

Structure of the review

Chapter 1 addresses barriers and facilitators in acute care and Chapter 2 covers the barriers and facilitators to delivering smoking cessation interventions in maternity care. The Chapters are divided into sections accompanied by comments on the main findings. Summary statements are provided at the end of each chapter.

Results

The review identified several barriers and facilitators of implementing evidence-based stop-smoking interventions in acute care.

1. **Smoking among health care staff is a barrier to engaging with smokers.** Healthcare Professionals (HCPs) who smoke report feeling awkward and guilty when advising smokers, they rate risks of smoking and benefits of quitting as lower than non-smokers, and they are less likely to engage in stop-smoking advice.

2. **Lack of time, knowledge and skills are the most commonly cited barriers to acute care staff intervening with patients who smoke.**
   Smoking cessation interventions that are expected to be provided by frontline healthcare staff need to be brief and easy to deliver. Asking about smoking and making a strong recommendation to seek help from the NHS-SSS tied with a referral, is an example of an approach that would minimise these barriers.

3. **Training healthcare professionals can have a positive effect on their practice.** Acute care staff cannot provide intensive interventions of the type known to be effective, but they can be instructed to identify smokers, make a strong recommendation that patients accept an offer of help from specialist staff, and assist with initiating treatment where need. Training needs to be brief and focus on practical issues and skills (i.e. identifying smokers and motivating them to accept referral for multisession treatment).

4. **Prompts, reminders, automated systems, and audit and feedback can assist HCPs in screening and offering smoking cessation treatment.**
   A range of prompts and reminders, from simple chart stickers to IT system prompts, aid HCPs to provide assistance to patients who smoke. Audit of patient records and patient review that is fed back to HCPs can also have a positive effect on practice.

5. **Organisational support is a key facilitator of stop-smoking activities.** Identification and referral of smokers with options of initiating treatment on wards cannot become a routine institution-wide strategy without the support from management.

6. **Smokers awaiting surgery can be advised to stop at any time.** The concerns that stopping smoking shortly before surgery may worsen surgery outcomes represents a common barrier to interventions with surgery patients. The concern is not warranted. Quitting early provides better health benefits,

but there is no evidence that stopping smoking within 8 weeks of surgery is associated with any adverse effects.

Evidence statements

E.S. 1.0 There is evidence that smoking among HCPs influences their knowledge and attitudes and represents a barrier to engagement with patients who smoke (O'Donovan 2009 [S-2], PEM 2005 [D-2], Slater 2006 [S-2], Xiao 2011 [S-1], Willaing 2004 [S-2], Bialous 2004 [S-1]).

E.S. 1.1 The main barriers to HCPs engagement with smokers include lack of time, knowledge, skills and viewing assisting smokers as being outside their job role (Bickerstaffe 2008 [S-3], May 2008 [S-2], McCarty 2001 [S-2], Thy 2007 [S-2], Warner 2004 [S-2], Warner 2008 [S-2]).

E.S. 1.2 Absence of stop-smoking medications on inpatient formulary, lack of chart reminders, and lack of staff knowledge represent commonly encountered barriers to prescribing stop-smoking medications within acute care (Goldstein 1999 [D-2]; Hawkshaw 2005 [S-2]; May 2008 [S-2]; Rigotti 1999 [S-2]; Vega 2010 [S-3]).

E.S. 1.3 There is evidence that identification of smokers can be improved by training HCPs (Carson 2012 [D-3]), Hill 2008 [S-3], Hodgson 2011 [S-3], Liu 2010 [S-3], Walsh 2007 [S-1], Ward 2003 [S-3]), introduction of prompts and reminders (Chang 1995 [S-3], Garrett-Szymanski 2006 [S-3], McDaniel 1999 [S-3], Nicholson 2000 [S-2]), and use of automated computer systems (Garret-Symanski 2006 [S-3]), Haile 2002 [S-2], Wolfenden 2007 [S-1]).

E.S. 1.4 There is evidence that training has a positive effect on staff practice in addressing smoking (Al-Alawy 2011 [S-3], Ballbe 2008 [S-2], Bryant 2008 [S-1], Freund 2009a [S-3], Gosselin 2011 [S-2], Kloss 2011 [S-3], Liu 2010 [S-3], Montner 1994 [S-1], Naudziunas 2005 [S-2], Vega 2010 [S-3], Walsh 2007 [S-1], Warner 2009 [S-1).

E.S. 1.5 Organisational support seems essential to implement institute-wide provision of stop-smoking support (Al-alawy 2011 [S-3], Bickerstaffe 2008 [S-3], Williams 2005 [S-1], Zhang 2005 [S-1]).

E.S. 1.6 Presentations and stands on wards and intensive involvement with hospital staff can improve awareness of SSS and increase referral rates (Hodgson 2011 [S-3], Hopkinson 2011 [S-3]).

E.S. 1.7 There is no evidence that the concern that stopping smoking only a few weeks prior to surgery might worsen clinical outcomes is justified (Myers 2011 [S-3]).

Chapter 2: Barriers and facilitators of providing effective stop-smoking treatment in maternity care

The review identified several barriers and facilitators of implementing evidence-based stop-smoking interventions in pregnancy.

1. **There are no serious barriers to recording the smoking status of pregnant women and this is done generally well.**

2. **The main barriers to MWs engaging in stop-smoking interventions include perceived lack of time and skills, belief that their advice is ineffective, and fear of damaging relationship with patients**. The existence of UK-SSS has been instrumental in overcoming these barriers, as MWs can be asked just to motivate and refer smokers.

3. **Training all MWs to encourage and refer smokers to stop-smoking advisors is feasible and productive**. MWs are generally not keen to engage in stop-smoking interventions themselves, and training them to do so has not been shown to improve quit rates. In contrast, a number of Primary Care Trusts (PCTs) have been successful in providing routine training to all MWs to motivate and refer smokers to SSS.

4. **The key features of successful NHS pregnancy services include organisational support, brief training of midwives in motivating and referring smokers, and provision of intensive multisession treatment by NHS-SSS specialists**. Dedicated pregnancy services have been funded by the NHS for the past 11 years. Two comprehensive surveys have evaluated their activities and they provide a wealth of data that can inform practical guidelines.

5. **There are two models of care. Referring pregnant smokers to advisors employed to work only with pregnant smokers, and referring to**

'mainstream' SSS. The latter achieves the same success rate at lower cost, but the former generates higher throughput

Evidence statements

E.S. 2.0 Midwives in the UK record smoking status of pregnant women routinely (Bryce 2009 [S-3]; Lee 2006 [S-3]; McGowan 2010 [S-3]; Taylor 2001 [S-3]).

E.S. 2.1 The main barriers to MWs engaging with smokers include perceived lack of time and skills, belief that their advice is ineffective, and fear of damaging relationship with patients (Abatemarco 2007 [S-3], Aquilino 2003 [S-2], Beenstock 2012 [S-1], Bishop 1998 [S-2]), Cooke 1996 [S-3], Cooke 1998 [S-3], Cooke 2000 [S-2], Hartmann 2007 [S-2], Herberts 2012 [S-3], Jordan 2006 [S-2], Valanis 2003 [S-3]).

E.S. 2.2 Regarding the perception by MWs that discussing smoking can be perceived by pregnant smokers as 'nagging', smoking women generally accept that smoking should be discussed as part of maternity care in both the pre- and post-natal periods (Groner 2005 [S-3], Wall 1995 [S-3], Winickoff 2010 [S-3], Herberts 2012 [S-3]).

E.S. 2.3 Monitoring and feedback on performance help to initiate and maintain desirable practice (Hyndman 2005 [S-3], Valanis 2003 [S-3]).

E.S. 2.4 Simple referral systems that involve minimal time and effort from midwives, are conducive to improved rates of advice and referral (Hartmann 2007 [S-2], Valanis 2003 [S-3], Windsor 2000 [S-2]).

E.S. 2.5 Training midwives in providing stop smoking interventions themselves (as opposed to referrals to specialist treatment) has limited impact on quit rates. (Albrecht 2011 [S-1], Bakker 2003 [S-1], Hyndman 2005 [S-3], Lin 2003 [S-NA], Wisborg 1998 [S-1]).

E.S. 2.6 Within the UK NHS, the best results are associated with PCTs which provide the following: Organisational support; brief but compulsory training of all

midwives to motivate smokers and refer them to SSS; specialist advisors offering multisession treatments accompanied by NRT; and provision of home visits where required (Bryce 2009 [S-3]; Lee 2006 [S-3]; McGowan 2010 [S-3]; Taylor 2001 [S-3]).

E.S. 2.7 There are two models of care. Referring pregnant smokers to advisors employed to work only with pregnant smokers, and referring to 'mainstream' SSS. The latter achieves the same success rate at lower cost, but the former generates higher throughput (Taylor 2001 [S-3]).

Conclusion

Most of the existing literature concerns health services with limited or no referral pathways to intensive treatments and it focuses on training front-line staff in brief routine interventions which are known to be ineffective. UK hospitals and maternity services have the option to refer smokers to specialist services and can in theory engage all staff in motivating and referring smokers. Such provision is currently in place in most maternity services. Within acute care however, this is not provided at all or provided inconsistently. The main barriers amenable to change include lack of organisational support, lack of clear referral pathways, and unrealistic training objectives.

Smoking cessation interventions in acute and maternity services:

Review of Barriers and Facilitators

Background to the review

Hospitalisation provides an opportunity for people to stop smoking. Smokers who are admitted to hospital are often highly motivated to quit and the hospital setting provides a potentially supportive environment to do so. Hospitals are smoke-free environments and admission brings people into direct contact with healthcare professionals who can advise on giving up smoking and offer evidence-based treatment. Similar considerations apply to pregnant smokers who use maternity services. Such smokers are usually motivated to stop smoking and their interaction with the maternity service offers ample opportunity to provide smoking cessation advice and treatment.

Smoking cessation counseling and medications delivered in an acute hospital setting, combined with follow-up support after discharge, increase smoking cessation rates. Smoking cessation interventions delivered to people awaiting surgery, which include follow-up care over several weeks, are also effective (NICE Review 2). Similarly, high intensity interventions aimed at helping pregnant women to stop smoking are effective (NICE Review 2). In contrast with the high intensity interventions, brief one-off interventions which can be delivered with minimal costs and which would be easier to implement on a large scale are of limited or no efficacy (NICE Review 2).

Despite strong evidence of the effectiveness of intensive interventions and the availability of NHS specialist stop-smoking services funded to provide them, such interventions are far from universal. There seems to be a number of barriers to providing help to smokers in both acute and maternity care. There is a need to systematically review not just the literature on the efficacy of stop smoking interventions, which are usually evaluated in a somewhat rarified research setting, but also the barriers and facilitators of stop smoking activities in real-life acute and maternity settings.

Aim of the review

This review addresses the barriers and facilitators of smoking cessation interventions in acute and maternity services. It considers the following two questions:

1. How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation?

2. What barriers and facilitators affect the delivery of effective interventions?

Methodology

The review used a systematic approach to identify literature that provides information on the two questions above. The search also covered literature with information on the views (knowledge, attitude, beliefs) of service providers and service users, and any considerations of effects that the deliverer, setting, timing, frequency, duration of the intervention, as well as severity of dependence may have on the acceptability of the intervention.

The review does not cover literature relating to primary care unless acute care is involved, e.g. in referring patients. The review also does not cover mental health services.

Search strategy

The search strategy for Medline is shown in the review protocol (see Appendix 1). The review protocol also shows the list of electronic databases and websites that were searched. Other relevant references were identified from articles generated by the search and from our previous work in this area.

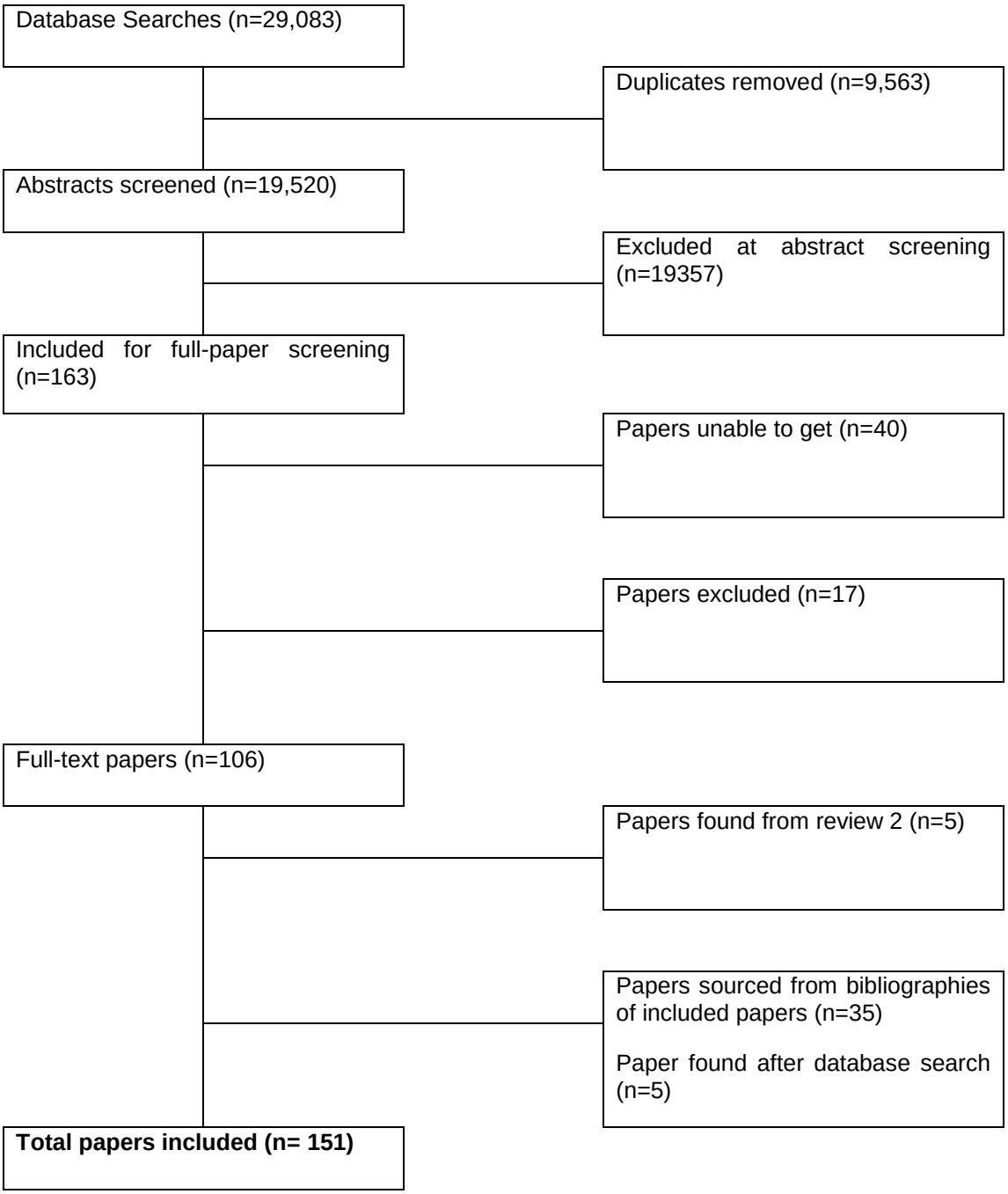
Inclusion Criteria

We included all relevant experimental, observational and qualitative studies, discussions, and descriptive reports published in English.

Search results

Searches of the databases returned 29,083 records. After duplicates were removed a total of 19,520 titles and abstracts were screened. Full papers were also obtained where there was no abstract and the relevance could not be assessed by the title alone. A total of 163 papers were identified for full text retrieval and 150 papers were included. A flow diagram illustrating the screening procedure is included in figure 1 below. Studies excluded at the full-paper screening stage are listed in appendix 4, along with a brief reason for exclusion.

Figure 1: Flow diagram of publications included in the review



Classifying papers included in the review

Papers were classified as:

Studies (S) – papers that include original data. These may be trials, surveys, meta-analyses, service audits or qualitative studies. S papers may be cited for their data, but also for issues flagged up in the discussion of the findings or implementation.

Discussions (D) – papers which do not present any new data but consist of descriptions of current practice, discussions of issues, or reviews of or commentaries on other papers

Applicability to the UK setting

Each paper was rated 1, 2 or 3 according to their relevance for informing UK practice (1=low relevance; 3=high relevance). This rating is not related to the quality of the papers. E.g. a paper from the 1980s reporting on smoking among staff in a Spanish hospital may be methodologically strong, but would be rated as 1 because it does not contain information useful in the current context. On the other hand, a news item in a UK nursing journal including an interview with a nurse describing problems with a local consultant who does not allow prescribing of NRT may be just an anecdotal report, but would be rated 3 as it flags up an issue relevant for the current NHS environment.

Data extraction

Due to the heterogeneous nature of the studies and the focus on qualitative issues concerning barriers and facilitators applicable to the UK health service, we only present one meta-analysis, concerning the impact of stopping smoking shortly before surgery on surgery outcomes.

Summary and evidence statements

Given the mostly qualitative and anecdotal nature of the reviewed material, a commentary is provided at the end of each section to discuss the findings.

We attempted to provide evidence statements where possible, but it is important to note that these are sometimes based on consensus and anecdotal observations rather than on robust data. Summary statements are provided at the end of each chapter.

Structure of the review

The results of the review are presented in two Chapters addressing the two settings of interest; acute care and maternity services.

Chapter 1 includes a separate section on smoking cessation interventions with patients awaiting elective and semi-elective surgery. This is because in this area a specific barrier was identified, i.e. a concern that stopping smoking within eight weeks of surgery increases risk surgery complications.

As in the area of smoking cessation help provided within health care systems, the UK is ahead of much of the international literature; both Chapters include separate sections on literature concerning current UK practice.

The Chapters are divided into sections accompanied by comments on the main findings. Summary and evidence statements are provided at the end of each chapter.

CHAPTER 1: BARRIERS AND FACILITATORS OF PROVIDING EFFECTIVE STOP-SMOKING TREATMENT IN ACUTE CARE

Introduction

While helping smokers is an important task for the health service in general, it is particularly relevant in acute care. Many patients access specialists and hospitals due to smoking related illness. Most of those who carry on smoking are highly dependent as otherwise, given their illness and the usual strong motivation to stop smoking; they would have quit by now. Smoking–related illness and hospitalisation are important windows of opportunity for smoking cessation interventions, and the close involvement with health care systems should make provision of such interventions relatively easy. Helping such smokers should be an important priority for health care staff, because in many cases stopping smoking facilitates recovery from illness and reduces the need for further demands on health service resources.

The UK health service is much more conducive to a successful adoption of the best practice by all staff than is the case in any other country. This is because the NHS established a Stop-Smoking Service (SSS) in 1999, and stop-smoking treatment is now widely available. This makes the task of the front line NHS staff much simpler than that of their counterparts in other countries. Staff need only advise smokers to quit and refer those who need help to the SSS. Even in such a simplified scenario however, there are a number of practical considerations, which influence practice. Our review focuses on issues identified in the UK and on international literature, which are relevant for NHS practice.

Identified literature

We found 112 studies that contained data relevant for this Chapter. These are summarised in Appendix 2.

Section 1: Smoking among hospital staff

Several studies highlight the relevance of staff smoking status. In the UK and Ireland, smoking among doctors is now rare, but smoking among nurses is similar to the smoking rate in the general population (Malek 2007, S-survey [1]; O'Donovan 2009, S-qualitative [2]) and smoking prevalence among psychiatric nurses can be as high as 47% (O'Donovan 2009, S-qualitative [2]). It is possible that smoking among health care staff is under-reported.

Healthcare Professionals (HCPs) who smoke report feeling awkward and guilty when advising smokers (Bialous 2004, S-qualitative [1]; PEM 2005, D [2]), they differ in their knowledge and attitudes regarding smoking from non-smokers (e.g. they rate risks of smoking and benefits of quitting as lower), and they are less likely to engage in stop-smoking advice (O'Donovan 2009, S-qualitative [2]; PEM 2005, D [2]; Slater 2006, S-survey [2]; Xiao 2011, S-service audit [1]; Willaing 2004, S-survey [2]). Ex-smokers have higher self-rated qualifications for counselling patients on smoking than current and never-smokers, but fall in between the two groups in the frequency of providing smoking cessation advice (Willaing 2004, S-survey [2]). Apart from lowering the likelihood of intervening with smokers, it is also possible that smoking among HCPs may reduce the impact of general anti-smoking messages.

Smoking prevalence in pre-registration UK nurses is similar to their registered counterparts (Blake 2011, S-survey [2]). As many nurses start smoking at nursing school, prevention and cessation efforts should be focused there (Slater 2006, S-survey [2]).

Six studies reported that when acute health services were becoming smoke-free, the prevalence of smoking among staff decreased (Olive 1996, S-survey [1]; Longo 2001, S-service audit [2]; Becker 1989, S-survey [1]; Stillman 1990, S-survey [1]; Batlle 1991, S-survey [1]; Xiao 2011, S-service audit [2]). The findings are mostly based on a comparison of pre- and post-ban surveys and need to be interpreted with caution because the policy implementation process may have made smokers more likely to avoid the second survey, or increase the incidence of misreporting. Such

concerns of course affect all cross-sectional findings of lowering of smoking prevalence at a time of increasing social stigmatisation of smoking.

Comment

Smoking among HCPs presents a barrier to engagement with patients who smoke. In the UK, there are stop smoking interventions available, which have proven efficacy with health care staff (NICE Review 2). Regarding the effects of a transition to smoke-free health service on staff smoking, the NHS is now smoke-free and whatever effects the transition to the new norm may have had on smoking among staff, this has already happened.

E.S. 1.0 There is evidence that smoking among health care professionals (HCPs) influences their knowledge and attitudes and represents a barrier to engagement with patients who smoke (O'Donovan 2009 [S-2], PEM 2005 [D-2], Slater 2006 [S-2], Xiao 2011 [S-1], Willaing 2004 [S-2], Bialous 2004 [S-1]).

Section 2: Other barriers to staff engaging in stop-smoking interventions

Lack of time, knowledge and skills are among the most commonly cited barriers for intervening at any level (Bickerstaffe 2008, S-service audit [3]; Thy 2007, S-survey [2]; Warner 2004, S-survey [2]; Warner 2008, S-qualitative [2]).

Other barriers include short hospital stays; and patients leaving wards for investigations and interventions, which make on-ward stop-smoking sessions difficult to deliver (Goldstein 1999, D-Commentary [2]; Rigotti 1999, S-prospective [2]; Thompson 2006, S-RCT [2]; Vaughn 2002, S-survey [2]).

Three papers reported that HCPs felt it was not their role to provide stop smoking interventions (May 2008, S-qualitative [2]; Thy 2007, S-survey [2]; McCarty 2001, S-survey [2]). Staff who have a speciality related to smoking (e.g. cardiology), were more likely to report offering advice that those who did not (McCarty 2001, S-survey

[2]). However, as reported earlier the number of HCPs discussing options for quitting is low across specialties (Segaar 2007, S-survey [3]).

Barriers to providing stop-smoking intervention in parents of hospitalised children

Barriers to providing parents with smoking cessation support were identified by Geller 2011 (S-survey [2]). These included parents' resistance to discussions about their smoking, short hospital stays, and non-standardised care. Fifty seven per cent of respondents indicated that they were not trained to discuss smoking cessation with adults. Nurses working in hospitals with smoking cessation plans or cessation counselling services for parents had much higher rates of assessing willingness to quit and assisting with a quit plan.

Barriers to initiating stop-smoking medications

Absence of NRT on inpatient formulary, lack of chart reminders, and lack of staff knowledge about stop smoking medications have been identified as the common barriers in this area (Goldstein 1999, D-commentary [2]; Hawkshaw 2005, S-service audit [2]; May 2008, S-qualitative [2]; Rigotti 1999, S-prospective [2]; Vega 2010, S-service audit [3]).

May 2008 (S-qualitative [2]) interviewed 13 members of staff from an acute cardiac care unit in the Australia where NRT was not used at all. The key barriers included the fact that NRT was not on the formulary and staff lacked relevant knowledge. Related to the latter, there were concerns about NRT cost and its safety. Several of the doctors surveyed felt that the decision to commence NRT lay with the patient's general practitioner or other health care advisor (e.g. pharmacist) as it was felt that they had a greater knowledge concerning the indication of NRT and contraindications for its use.

E.S. 1.2 Absence of stop-smoking medications on inpatient formulary, lack of chart reminders, and lack of staff knowledge represent commonly encountered barriers to prescribing stop-smoking medications within acute care (Goldstein 1999 [D-2]; Hawkshaw 2005 [S-2]; May 2008 [S-2]; Rigotti 1999 [S-2]; Vega 2010 [S-3]).

Section 3: Identifying patients who smoke

The first necessary pre-requisite of any stop smoking intervention is identifying whether a patient smokes. Hospitals that are more likely to record smoking status have been shown to perform better on indices of smoking cessation counselling (Williams 2005, S-service audit [1]).

Several interventions have been shown effective in increasing the rates of identification of patients who smoke. These are summarised below.

Staff training

Staff training can increase the rate at which HCPs screen for tobacco use (Carson 2012, D-systematic review [3]; Hill 2008 S-pre-post [3]; Hodgson 2011, S-service audit [3]; Liu 2010, S-service audit [3]; Walsh 2007, S-survey [1]; Ward 2003, S-survey [3]).

Prompts and reminders

Introducing chart reminders can increase substantially the identification of patients who smoke (Chang 1995, S-pre-post [3]; Garrett-Szymanski 2006, S-service audit [3]; McDaniel 1999, S-service audit [3]; Nicholson 2000, S-survey [2]).

Removing such prompts have led to a return to poor practice (McDaniel 1999, S-service audit [3]).

Lack of prompts to remind staff to routinely check smoking status is one explanation for low delivery of smoking cessation interventions by physicians in the US (Goldstein 1999, D-commentary [2]; Wolfenden 2009, D-commentary [1]).

Automated systems

Three studies examined the effect of systematic screening tools (Garrett-Szymanski 2006, S-service audit [3]; Haile 2002, S-pilot [2]; Wolfenden 2007, S-survey [1]).

Garret-Symanski 2006 (S-service audit [3]) showed that daily lists compiled by nurses caught only a quarter of smokers, compared to room-by-room assessment by nursing students. However the implementation of a mandatory field on hospitals electronic admission screen got 90%. A list of smokers and their location within the hospital could be generated daily.

Haile 2002 (S-pilot [2]) examined a computerised screening and counselling tool in patients attending a surgical preadmission clinic. The intervention was acceptable to both staff and patients. The majority of patients reported that the preadmission clinic was an appropriate place to help them stop smoking. Similarly Wolfenden 2007 (S-survey [1]) reported that a self-assessment of smoking status via touch-screen computer at a pre-admission appointment was acceptable to both staff and patients.

Screening for tobacco use in parents of hospitalised children

Whilst it is common for HCPs to ask their patients about smoking, parents of sick children appear to be less frequently asked about their smoking status.

Hymowitz 2005 (S-survey [2]) surveyed parents/caregivers of sick children who were taking part in a doctor training intervention study. Only half of smokers reported that the doctor offered them help to quit, and 25% were offered advice on protecting their children from second hand smoke. A barrier to discussing parent's smoking seems to exist across health care systems. Chan 2011 (S-survey [1]) surveyed paediatric ward nurses in Malaysia and found that two thirds did not document parent's

smoking status. The ward nurses reported identification of smoking parents was dependent on the child's diagnosis (e.g. smoking related) on admission.

Who should screen for tobacco use?

Administration staff usually have contact with all patients admitted to hospital, making them a potential workforce to screen for tobacco use. Schofield 1999 (S-service audit [3]) reported that only 63% of patients with urinary cotinine indicative of current smoking were actually recorded as a smoker by admin staff. However in most cases, clinical staff corrected the inaccuracy.

Although it may seem useful for administration staff to screen for tobacco use, it may be more clinically relevant for clinical staff to do this and to tie the screening question with the advice to quit and referral for treatment. Within the NHS, clinical staff could in theory initiate automated referrals to specialist advisors if the hospital systems allowed this.

Comment

Training staff in recording smoking status can be effective, but in practice it can also be demanding in terms of management, staff time, maintenance over staff changes, and monitoring. The most efficient and effective approach in health services where smokers can be referred for specialist treatment seems to be the use of automated systems, which can link smoker identification with triggering a referral.

E.S. 1.3 There is evidence that identification of smokers can be improved by training HCPs (Carson 2012 [D-3]), Hill 2008 [S-3], Hodgson 2011 [S-3], Liu 2010 [S-3], Walsh 2007 [S-1], Ward 2003 [S-3]), introduction of prompts and reminders (Chang 1995 [S-3], Garrett-Szymanski 2006 [S-3], McDaniel 1999 [S-3], Nicholson 2000 [S-2]), and use of automated computer systems (Garret-Symanski 2006 [S-3]), Haile 2002 [S-2], Wolfenden 2007 [S-1]).

Section 3: Provision of stop-smoking interventions

Staff training

A number of studies evaluated the impact of training staff in smoking cessation treatments on staff practices. Most of these studies were from health care systems with limited or no referral options and the focus was on getting doctors (and sometimes nurses) to treat smokers. Because hospital staff cannot provide multisession intensive interventions, the training typically focused on brief procedures, mostly of Intensity 1 and 2 (i.e. one or two sessions with no post-TQD follow-up). This poses a serious problem in that such interventions are known to have limited or no effect (NICE Review 2).

A number of papers reported on evaluations of such programmes (Al-alawy 2011, S-service audit [3]; Ballbe 2008, S-pre-post [2]; Bryant 2008, S-pre-post [1]; Freund 2009a, S-RCT [3]; Gosselin 2011, S-RCT [2]; Kloss 2011, S-service audit [3]; Liu 2010, S-service audit [3]; Montner 1994, S-pre-post [1]; Naudziunas 2005, S-survey [2]; Vega 2010, S-service audit [3]; Walsh 2007, S-survey [1]; Warner 2009, S-survey [1. This was usually done by testing knowledge and attitudes pre- and post-training (Ballbe 2008, S-pre-post [2]; Bryant 2008, S-pre-post [1]; Montner 1994, S-pre-post [1]; Vega 2010, S-service audit [3]; Walsh 2007, S-survey [1]; Warner 2009, S-survey [1]) by monitoring patient records for information on provision of interventions (Al-Alawy 2011, S-service audit [3]; Ballbe 2008, S-pre-post [2]; Kloss 2011, S-service audit [3]; Liu 2010, S-service audit [3]) and by interviewing patients (Freund 2009a, S-RCT [3]; Gosselin 2011, S-RCT [2]; Naudziunas 2005, S-Survey [2]). In most studies, training had an effect on staff practice, at least in a short term.

Interestingly, while staff self-appraisal can exaggerate their real activities (Palonen 2006, S-survey [2]), the opposite was also reported, i.e. staff reported knowing smoking status of 61% of patients, whereas 86% of patients reported being asked; staff said they advised 47% of patients to quit, whereas 55% of patients report receiving advice; and staff reported offering/providing NRT to 37% of patients, whilst 51% of patients said they were offered it; although only 23% reported receiving it (Freund 2009a, S-RCT [3]).

Regarding the question of what is a realistic duration of routine staff training, a survey of HCPs by Warner 2008 (S-qualitative [2]) found that US surgeons were willing to refer patients to local Quit lines and were amenable to receiving training, but this would need to be no more than 30 minutes long.

Bickerstaffe 2008 (S-service audit [3]) showed that using a work action group to champion smoking cessation training helped to promote it to staff.

Effects of prompts and reminders

Prompts such as stickers and chart reminders tend to increase the rate at which clinicians provide advice (Chang 1995, S-pre-post [3]; Cohen 1989, S-RCT [3]; Nicholson 2000, S-survey [2]). These findings are likely to be relevant in the UK setting where prompts and reminders could be used to increase rates of referrals.

Effects of feedback

Naudziunas 2005 (S-survey [2]) interviewed 56 CVD patients regarding the advice they received from their doctors on diet, monitoring, and relevant health behaviours including smoking. The results were then discussed with the doctors. This had a significant effect on doctors' practice. The following cohort of patients were much more likely to have their doctors discuss diet, cholesterol, smoking and relevant health behaviours with them.

Zhang 2005 (S-service audit [1]) tried to improve post-MI care in 38 hospitals by providing computerised data feedback to staff. This improved use of aspirin, beta-blockers etc. as well as delivery of stop-smoking advice.

Effects of automated systems

Koplan 2008 (S-service audit [3]) assessed the impact of adding a tobacco use template to a US hospital admission system. Coding a patient as 'smoker' prompted a drop-down menu of smoking cessation treatment and referral options for the physician to use. An audit of hospital records 4-months pre and post implementation of the template tool showed that it was used in 42% of all admissions and resulted in a small but significant increase in the proportion of patients that were referred for counselling (0.8 – 2.1%) and had NRT charted (1.6 – 2.5%).

Haile 2002 (S-pilot [2]) examined a computerised screening and counselling tool in patients attending a surgical preadmission clinic. The tool detected 56 smokers who went on to complete the interactive tailored (based on stage of change) cessation component. At follow-up 39% reported stopping smoking prior to surgery and the programme was rated as highly acceptable.

Wolfenden 2007 (S-survey [1]) reported that all the nurses and anaesthetists involved in a study using a patient self-assessment computer, found that the care prompts for smoking cessation that were automatically generated, very helpful. Staff found the system appropriate in offering pre-surgery patients stop smoking advice. The majority of the patients reported that the computerised counselling was easy to use and helpful alongside the provision of brief clinical advice and NRT.

How much can front-line staff do?

A consistent finding in the literature identified in this review is that the more HCPs are asked to do, the less likely they are to do it. HCPs are relatively good at screening for tobacco use and giving brief advice to quit, but are much less likely to provide further assistance (Schofield 1995, S-prospective [3]; Segaar 2007, S-survey [3]); Vaughn 2002, S-survey [2]; Vokes 2006, S-qualitative [3]; Von Garnier 2008, S-survey [3]; Von Garnier 2010, S-survey [3]; Warner 2009, S-survey [1]; Whyte 2006, S-qualitative [1]; Wilber 2011, S-service audit [2]).

Vokes 2006 (S-qualitative [3]) analysed audiotapes from doctor-patient interactions in an emergency department. Just over half were screened for smoking, with 56% of smokers given advice to quit, and 13% offered further help. Similarly in a survey of outpatients (Von Garnier 2008, S-survey [3]) contacted by phone within 24 hours after their hospital appointment, 81% were asked about smoking, 28% received advice on risks, 10% received advice to quit, and 9% were offered help to quit. Even in environments where HCPs may be more likely to act (e.g. cardiology nurses), although most (80%) assessed smoking status, less (60%) discussed options for quitting (Segaar 2007, S-survey [3]).

An obvious solution is to have dedicated staff providing treatment. Liu 2010 (S-service audit [3]) describes a dramatic improvement in a US hospital with poor record of addressing smoking. Each ward was allocated a stop-smoking advisor. Admission nurses only recorded smoking status and the advisors did the rest. Recording of smoking status and the provision of the intervention improved to some 90%.

Comment

The UK is now well ahead of the existing research in this area from countries where front line staff cannot refer smokers to specialists and so are trained to provide treatment themselves. Referral for smoking cessation treatment to carry on providing support after discharge from the hospital seems essential for the initial treatment to be effective. The meta-analyses undertaken in Review 2 demonstrated that hospital-based smoking cessation interventions are ineffective unless they include multi-session follow-up of 4-weeks or more post-discharge. Routine front line staff cannot take on the role of specialist advisors and organise extended support over a number of consultations set up just for this purpose. Even if they did, and such activities were given priority over their primary purpose, training tens of thousands of doctors and nurses in specialist interventions and supervising and monitoring them would be impracticable.

Since the establishment of the NHS Specialist Stop-Smoking Service (SSS), the task of front line staff in the UK is to motivate smokers to quit and refer them to SSS, rather than to take on the role of stop-smoking advisors.

The UK training or automated prompts can thus focus exclusively on motivating and referring smokers. There is evidence that a brief training (40 minutes) is effective in increasing referrals from UK GPs (McRobbie 2008). There is no reason to expect that the same approach would not work in acute care. Automated systems however should be much more cost effective and easier to implement. Such systems could also allow for easier and more consistent prescribing of smoking cessation medications for patients who need them. They would also allow performance management and timely feedback to staff. If a systematic approach to charting NRT is taken then it should be prescribed on an 'as required' (*pro re nata*; PRN) basis. Nursing staff may require some basic training in how to instruct patients to use these products.

Apart from organisational, financial, and time issues, we are aware of two other barriers to a routine implementation of training within acute care, which are not captured in the current literature. The notes below are only anecdotal, but they may be informative.

As a legacy from past initiatives, many PCTs continue to try to train front line staff in staging smokers using the trans-theoretical model and in smoking cessation interventions they are asked to provide themselves. Some others try to focus on the core tasks of motivating smokers and referring them on, but cannot resist including a host of marginal topics and making the training events unnecessarily long and demanding (e.g. half-day long). This makes such events expensive and poorly attended, without improving the chance that they will increase key activities more than a simple instruction. The key elements of effective training seems to be a briefing on encouraging patients to accept an offer of SSS treatment (backed by understanding of what SSS offers and of its efficacy), and arranging treatment at bedside or a post-discharge referral. We estimate that less than 30-minutes of training should be sufficient, especially if the hospital organisation is willing to include this as a part of compulsory induction of all new staff, and monitor the rates of

referrals for smoking cessation treatment and provide feedback to staff who under-perform. Some approaches tried in the UK so far are described in the section on Referral and collaboration with SSS below.

Another barrier to implementing such a pragmatic approach is that there exists no clear template for what such training should involve. Perhaps the UK Centre for Tobacco Control Studies (UKCTCS) which includes specialists with direct experience of smoking cessation interventions in acute care can be commissioned to develop a simple and straightforward training content which would be easy to disseminate. One possible hurdle to such a plan is the lack of consistency in the way different SSS operate.

E.S. 1.4 There is evidence that training has a positive effect on staff practice in addressing smoking (Al-Alawy 2011 [S-3], Ballbe 2008 [S-2], Bryant 2008 [S-1], Freund 2009a [S-3], Gosselin 2011 [S-2], Kloss 2011 [S-3], Liu 2010 [S-3], Montner 1994 [S-1], Naudziunas 2005 [S-2], Vega 2010 [S-3], Walsh 2007 [S-1], Warner 2009 [S-1).

Section 4: Organisational factors

Several reports point out the importance of organisational support in facilitating staff involvement. This includes primarily the involvement of senior hospital management, so that recording of smoking status and referring smokers to treatment, establishment of routine referral pathways, and access to stop smoking medications do not rely on individual HCPs good will, but form a part of their official duties.

Leadership

Hospitals with a good track record of implementing smoking cessation strategies rely on a network of senior management and clinicians to develop and monitor

adherence to the relevant protocols (Al-Alawy 2011, S-service audit [3]; Williams 2005, S-service audit [1]; Zhang 2005, S-service audit [1]).

In the UK, an example of organisational effort spanning acute and primary care has been published describing an initiative at Rotherham Foundation Hospital Trust (Al-alawy 2011 (S-service audit [3]). A steering group was set up comprising senior medical staff and PCT representatives. The main goals were setting up a new smokers' clinic, training front line staff in referral to the new clinic, setting up a patient group direction (PGD) to enable 'non-prescribers' to supply NRT, and review progress. There was some initial resistance from staff, due primarily to time constraints. Over 13 months, 269 front-line staff were trained (via professional development days or during staff handover), resulting in 890 referrals to the in-house stop smoking service, 414 quit dates, and 143 four-week quitters.

Having agreement from departmental leads to train all staff has been seen to increase the uptake of training in a pre-operative setting (Bickerstaffe 2008 (S-service audit [3]).

Changeover in management positions, particularly senior medical officers, have been reported to hamper implementation of such programmes (Freund 2009a, S-RCT [3]).

Performance management

Automated feedback on performance at departmental level can play an important role in maintaining good rates of identification and referral (Zhang 2005, S-service audit [1]). The creation of a dedicated tobacco control group (comprised of front-line and senior physicians and nurses, and executive management) transformed the practices of one large US hospital, increasing recording of smoking status to 90% (Liu 2010, S-service audit [3]). Wards were allocated dedicated smoking cessation advisors, leaving recording of smoking status as the only task for admission nurses.

Comment

The organisational task in the current NHS environment seems simple. When patients are admitted on the ward, the computer system could prompt clinical staff to ask whether the patient smokes, and if so, whether they would be interested in receiving help in quitting. A mouse click could trigger a visit by a smoking cessation advisor at bedside to initiate treatment if the hospital has such a service in place, or charting of smoking cessation medications and automated referral to local SSS on discharge.

Our own experience at the Royal London Hospital illustrates some of the barriers encountered in the NHS. The hospital computer system there was commissioned from a private company which charges tens to hundreds of thousands of pounds for including any new item. Questions regarding smoking status, and an option to refer were eventually included, but they had to conform to an unsuitable and clumsy format, and had to be hidden in an area several screens away from the front screen. Staff needed training in how to use the system, which proved impracticable. Despite a series of meetings of senior management, PCT and SSS, computerized referrals to the specialist working in the hospital remain at a negligible trickle. The bulk of referrals is by phone and e-mail from a few keen members of staff.

E.S. 1.5 Organisational support seems essential to implement institute-wide provision of stop-smoking support (Al-alawy 2011 [S-3], Bickerstaffe 2008 [S-3], Williams 2005 [S-1], Zhang 2005 [S-1]).

Section 5: Referral and collaboration with NHS SSS

We identified several reports referring specifically to the NHS SSS.

Hodgson 2011 (S-service audit [3]) reported a positive result of a simple intervention. An audit at an acute medical unit in Brighton showed that only 4% of smokers received any cessation advice. From the respiratory wards, only seven patients were referred to SSS over 6 months. Presentations were made to ward nursing staff by

the smoking cessation specialist nurse, and foundation trainees were nominated as ‘smoking champions’ to raise awareness among their peers. The respiratory wards referred 77 patients to the service over the next 6 months. Four-week cessation rate in these patients was reported to be remarkably high (82%).

A shared learning database page on NICE website includes a document describing hospital-based smoking cessation practice in Bolton Hospitals NHS Trust (Bickerstaffe 2008, S-service audit [3]). Hospital staff are receiving two types of training – Level 1, a brief intervention to motivate quit attempts (training takes 3 hours) and Level 2, an intermediate level assessment protocol to dispense NRT (training takes 6 hours). Patients need to be screened at both levels before receiving NRT. The training is being modified to include advice on diet, physicial activity and alcohol as well. Over a 6-year period, there were over 5,000 Level 1 referrals to SSS from some 1,000 staff who were trained to Level 1. Data are not available on how many of these referrals resulted in treatment attendance and successful quits. Over 4.5 years, there were 558 Level 2 assessments from 158 members of staff trained to Level 2. The document notes the concerns within the health service that quitting within 8 weeks of surgery may be detrimental to surgery outcomes due to increased mucus production (a common belief not supported by evidence – see Section 6). Training has been labour-intensive because staff finds it difficult to free the necessary amount of time and they are attending in only small batches. The document illustrates how enthusiastic individuals can drive desirable practice, but it also documents the common observation that local training programmes tend to be unnecessarily long.

Hopkinson 2011 (S-service audit [3]) designed a ‘care bundle’ for COPD patients discharged from a respiratory ward at a London hospital. This covered information on pulmonary rehabilitation, inhalers, follow-up appointments, COPD information and support resources, and referrals of smokers to community or clinic treatment. It was difficult for the staff to attend teaching sessions without impeding clinical work. Members of the team manned a stand on the ward providing teaching in a ‘drop in’ way. During the course of a shift all the nurses on the ward could be briefed with minimal disruption. Pharmacists involved in the project also taught staff daily. Regarding the smoking element of the Bundle, 25 smokers seen over 2 months were

all offered a referral for treatment (11 declined). The authors warn that educational efforts must be maintained because of staff turnover.

Comment

As discussed in the previous section, despite the potential simplicity of the UK system (staff can simply refer smokers to the NHS-SSS), many smokers are not offered such a referral. Presentations/stands on individual wards were successful. Some SSS employ advisors that can see patients on wards, but referring patients on discharge or from outpatient clinics to local SSS seems also a good option.

Under the pressure of local targets, some services have now dissolved specialist treatment provision, employ no dedicated stop-smoking clinicians, and rely instead on a large network of advisors such as pharmacists, health trainers, dentists, etc. The impact of this for acute care is that such services may have no specialists to whom acute care patients can be referred for multisession intensive treatment.

E.S. 1.6 Presentations and stands on wards and intensive involvement with hospital staff can improve awareness of SSS and increase referral rates (Hodgson 2011 [S-3], Hopkinson 2011 [S-3]).

Section 6: Smoking cessation interventions with patients awaiting surgery

A concern that has been circulating over the past two decades is that stopping smoking within a few weeks of surgery may not just be ineffective in reducing post-operative complications, but that it can contribute to them. It would appear that this concern originated from a 1989 paper that found postoperative pulmonary complications in 6 of 18 continuing smokers, compared to 12 of 21 ex-smokers who quit for less than 8 weeks prior to surgery (Warner 1989, S-retrospective [3]). The report did not include statistical analysis, but the authors suggested that losing the cough-promoting effect of cigarettes before any improvement in sputum clearance might predispose to retention of secretions and postoperative pulmonary

complications. Although the difference between the two groups is not statistically significant (chi-square=2.2; *p*=0.2), the warning has in some instances become accepted as a proven fact.

For example, an influential guidance document from the London Health Observatory states that 'Cessation should occur at least 8 weeks prior to surgery to minimise the increase in pulmonary complications in recent quitters' (Furlong 2005). The eight-week cut off point has also been recommended by other sources (Bluman 1998; Khan 2005). Patients are often scheduled for operations at relatively short notice, and an opportunity to discuss smoking may arise fairly late. Clinicians faced with smoking patients, or even with patients who pro-actively ask for help with stopping smoking, are often unsure whether they should provide smoking cessation treatment shortly before an operation.

Our preparatory examination of the existing literature on this topic identified two important methodological issues. Firstly, most existing studies focus on comparisons of early quitters (usually those smoke-free for more than two months before their surgery) and recent quitters (those smoke-free for only a few weeks or up to two months before their surgery), with never smokers. Of these three groups, recent quitters often have the poorest outcomes. This seems to form one of the sources of warnings about recent quitting. However, showing that recent quitters have more complications than early quitters and/or never smokers may simply mean that recent quitting is less beneficial than early quitting. Only a comparison with continuing smokers can show whether recent quitting poses a risk.

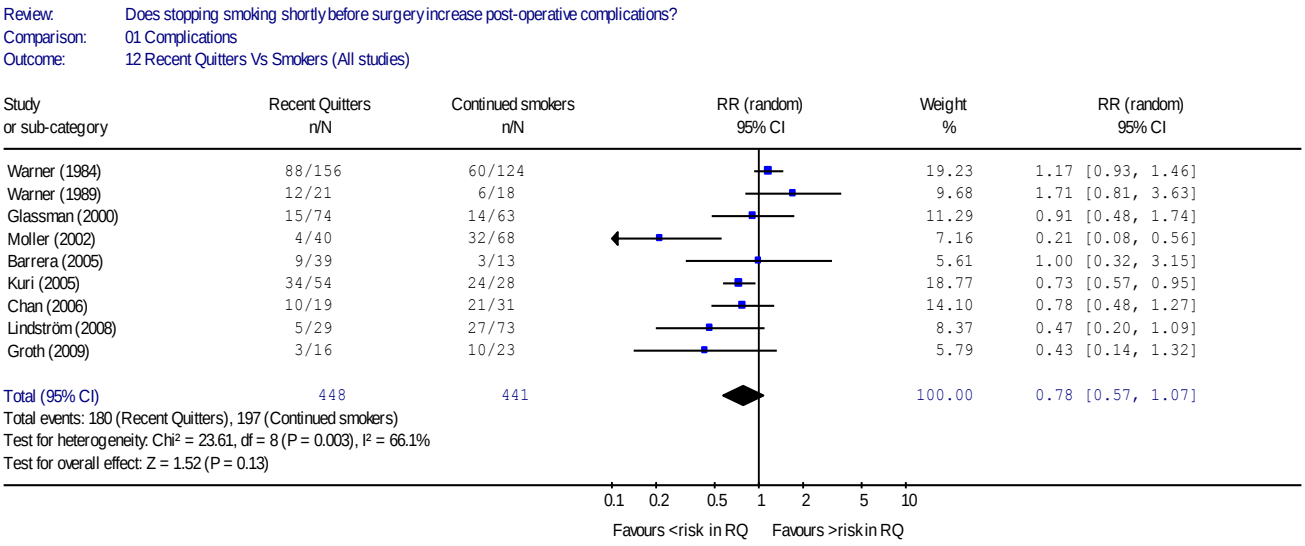
The second issue concerns biochemical validation of self-reported abstinence. Hospital patients are often acutely aware of the fact that smoking may have contributed to their illness, worry about the disapproval of clinical staff, and tend to misreport their smoking status (Woodward 1992; Bittoun 1991). If the sample of patients classified as recent ex-smokers contains a proportion who are in fact still smoking, this is likely to dilute any potential risks or benefits of recent quitting. Compared to studies based on self-reported smoking status, studies which

objectively validate self-reported abstinence of smoking provide more reliable evidence.

We addressed this issue in an earlier report to NICE and published our analysis (Myers 2011, S-meta analysis [3]).

A search of electronic databases identified nine studies that allowed comparisons of post-operative complications rates in patients who stopped smoking shortly before surgery and those who continued to smoke. Only one study found a beneficial effect of stopping smoking compared with continuing to smoke, but none of the studies identified any detrimental effects.

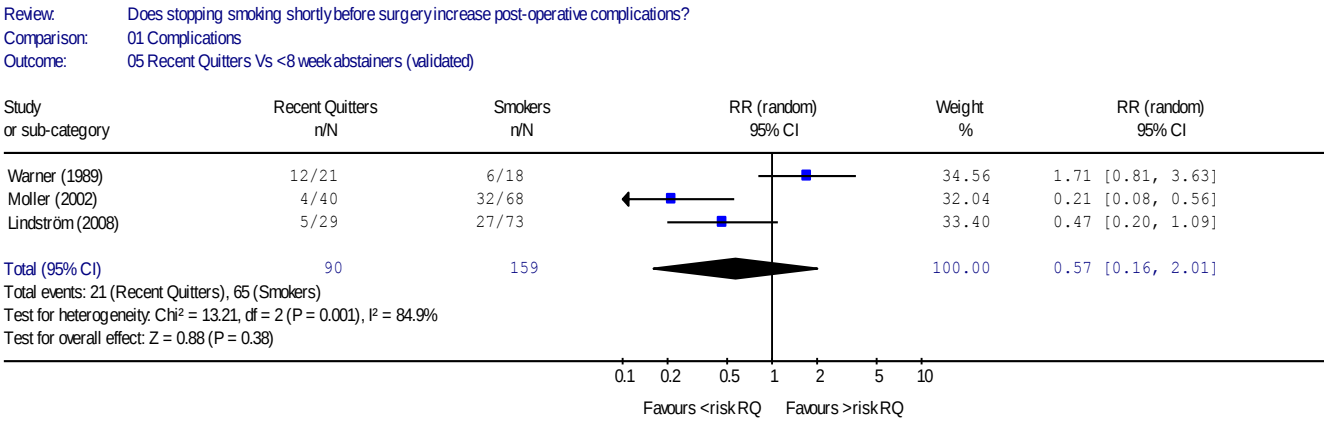
Figure 2: All nine available studies (RQ= recent quitters)



When all nine studies are combined there is no detrimental or beneficial effect of quitting shortly before surgery (RR, 0.78; 95% CI; 0.57-1.07).

Three studies, which had high quality scores and included validation of smoking status were combined.

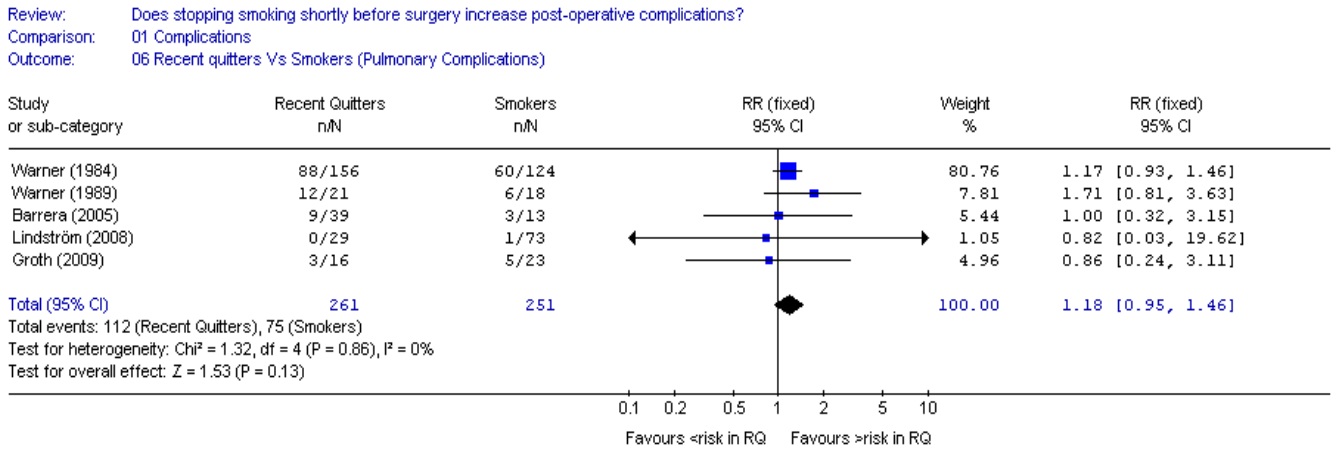
Figure 2: Studies with biochemical validation of self-reported abstinence



The results show no increase or decrease in overall postoperative complications (RR, 0.57; 95% CI; 0.16-2.01).

Four studies looked specifically at pulmonary complications.

Figure 3: Studies of pulmonary complications



Note: Groth 2009 (S-retrospective) [3]) lists number of complications rather than number of patients affected.

The results again show no increase or decrease in overall postoperative complications (RR, 1.18; 95% CI; 0.95-1.46).

Comment

Existing data indicate that the concern that stopping smoking only a few weeks prior to surgery might worsen clinical outcomes is unfounded. Patients should be advised to stop smoking as early as possible, but there is no evidence to suggest that health professionals should not be advising smokers to quit at any time prior to surgery.

E.S. 1.7 There is no evidence that the concern that stopping smoking only a few weeks prior to surgery might worsen clinical outcomes is justified (Myers 2011 [S-3]).

Summary Statements

The review identified several barriers and facilitators of implementing evidence-based stop-smoking interventions in acute care.

1. **Smoking among health care staff is a barrier to engaging with smokers.** Healthcare Professionals who smoke report feeling awkward and guilty when advising smokers, they rate risks of smoking and benefits of quitting as lower than non-smokers, and they are less likely to engage in stop-smoking advice.

2. **Lack of time, knowledge and skills are the most commonly cited barriers to acute care staff intervening with patients who smoke.** Smoking cessation interventions that are expected to be provided by frontline healthcare staff need to be brief and easy to deliver. Asking about smoking and making a strong recommendation to seek help from the NHS-SSS tied with a referral, is an example of an approach that would minimise these barriers.

3. **Training healthcare professionals can have a positive effect on their practice.** Acute care staff cannot provide intensive interventions of the type known to be effective, but they can be instructed to identify smokers, make a strong recommendation that patients accept an offer of help from specialist staff, and assist with initiating treatment where need. Training needs to be brief and focus on practical issues and skills (i.e. identifying smokers and motivating them to accept referral for multisession treatment).

4. **Prompts, reminders, automated systems, and audit and feedback can assist HCPs in screening and offering smoking cessation treatment.** A range of prompts and reminders, from simple chart stickers to IT system prompts, aid HCPs to provide assistance to patients who smoke. Audit of patient records and patient review that is fed back to HCPs can also have a positive effect on practice.

5. **Organisational support is a key facilitator of stop-smoking activities.** Identification and referral of smokers with options of initiating treatment on wards cannot become a routine institution-wide strategy without the support from management.

6. **Smokers awaiting surgery can be advised to stop at any time.** The concerns that stopping smoking shortly before surgery may worsen surgery outcomes represents a common barrier to interventions with surgery patients. The concern is not warranted, Quitting early provides better health benefits, but there is no evidence that stopping smoking within 8 weeks of surgery is associated with any adverse effects.

CHAPTER 2: BARRIERS AND FACILITATORS OF PROVIDING EFFECTIVE STOP-SMOKING TREATMENT IN MATERNITY SERVICES

Smoking by pregnant women has a range of potential negative consequences for the unborn child. As with users of acute service, users of maternity services are mostly aware of the potential benefits of stopping smoking, find stopping smoking on their own difficult, and can benefit from specialist help. Assisting them would appear to be an important priority for all maternity service staff.

We found 39 studies relevant to this section. A summary of these studies can be found in appendix 3.

The chapter is divided into 3 sections: Identification of pregnant women who smoke, Provision of interventions, and UK services for pregnant smokers

Section 1: Identification of pregnant women who smoke

Most midwives (MWs) screen for smoking routinely (Abatemarco 2007, S-survey [3]; Hartmann 2007, S-survey [2]; McGowan 2010, S-survey [3]). Almost all MWs who responded to a survey in an American study reported that they routinely ask about smoking and give advice to quit (Abatemarco 2007, S-survey [3]). Over 60% of O&G consultants in an American study said that they ask about smoking status at each visit (Jordan 2006, S-survey [2]). In a survey of 844 US maternity care providers 98% report that they routinely ask about smoking (Hartman 2007, S-survey [2]). In the UK, the recording of smoking status of pregnant women is a part of normal antenatal care and is done routinely across the country (Bryce 2009, S-prospective [3]; Lee 2006, S-survey [3]; McGowan 2010, S-survey [3]; Taylor 2001, S-survey [3]).

Pregnant smokers are sometimes reluctant to admit smoking to health professionals. Among a random sample of 3,475 pregnant Scottish women, 839 declared that they were smokers. The analysis of serum cotinine showed that 1,046 women were in

fact smokers, i.e. 19.8% of smokers did not admit that they smoke (Shipton 2009, S-retrospective [3]).

Where women are aware that a test of their smoke intake will be performed, the concordance of self-reported smoking and biochemical verification can be relatively high as participants are trying to avoid the potential embarrassment of a discrepancy between the two measures. E.g. in a UK study (Owen 2001, S-survey [3]), 161 pregnant women self-reported smoking and another 17 of those who reported to be non-smokers had salivary cotinine levels indicating smoking (i.e. 10% misreport rate). Some UK maternity services require all midwives to routinely monitor all pregnant women with CO monitors. This is likely to improve identification of smokers, although it is not clear whether this improves willingness to accept treatment. Having all midwives monitoring CO levels is expensive and it can be difficult to implement (McGowan 2010 S-survey [3]).

E.S. 2.0 Midwives in the UK record smoking status of pregnant women routinely (Bryce 2009 [S-3]; Lee 2006 [S-3]; McGowan 2010 [S-3]; Taylor 2001 [S-3]).

Section 2: Provision of stop-smoking interventions

NICE review 2 describes in detail the efficacy of different types of smoking cessation interventions with pregnant smokers. In brief, low intensity interventions (advice and written materials without follow-up support), have no effect, whereas high intensity interventions (interventions with regular contacts over several weeks) do increase abstinence rates. The rest of this section focuses on the barriers in implementing effective smoking cessation interventions, and what might be done to improve current practice.

While most maternity workers are good at identifying smokers and many give brief advice, they less often provide stop-smoking treatment (in health care systems which expect them to do so) or, in the UK, refer smokers to specialist services (Abatemarco

2007, S-survey [3]; Cooke 1996, S-survey [3]; Cooke 1998, S-survey [3]; Hartmann 2007,S-survey [2]; Jordan 2006, S-survey [2]). The reasons maternity care workers cite for not routinely providing assistance or referring patients have been well documented. The same barriers emerge from each study.

The standard barriers include lack of time; lack of knowledge and skills; belief that midwife-delivered treatments are ineffective; lack of staff and physical resources; and, as with monitoring smoking status, fear of damaging relationship with patients (e.g. a belief that patients may not be receptive to advice and attempts to offer it will be perceived as 'nagging') (Abatemarco 2007, S-survey [3]; Aquilino 2003, S-qualitative [2]); Beenstock 2012, S-survey [1]; Bishop 1998, S-qualitative [2]; Cooke 1996, S-survey [3]; Cooke 1998, S-survey [3]; Cooke 2000, S-RCT [2]; Hartman 2007, S-survey [2]; Herberts 2012 S-qualitative [3]; Jordan 2006, S-survey [2]; Valanis 2003, S-prospective [3]).

Another potential barrier to engaging with smokers is staff smoking. This has not been explored in this setting, but has been shown to influence acute care staff (see Chapter 1). It is likely that smoking among Midwives has a similar impact on practice. Fortunately, the issue is less urgent here because smoking prevalence among UK midwives is only 3% (Beenstock 2012, S-survey [1]).

Midwives who see smoking cessation as part of their role are more likely to be positive about smoking cessation advice (Bakker 2005, S-survey [1]).

A recent focus group study found that most of the 15 interviewed London-based midwives assumed that women who continue smoking when pregnant would not want to quit. The patients, on the other hand, wanted to know the facts about smoking effects on the foetus, with half feeling that they received inconsistent and insufficient information from midwives (Herberts 2012 S-qualitative [3]).

As with interventions in acute care, it seems that the more complex an intervention or set of guidance and the more steps are involved, the less likely it is to be successfully implemented in routine care (Windsor 2000, S-survey [2]). It is therefore not surprising that having a simple system to refer smokers, with minimal time and effort needed from midwives, is associated with better adherence (Hartmann 2007,

S-survey [2]). Simple questions about smoking status and interest in referral included in routine evaluation forms can increase rates of advice and referral. The shorter and less cumbersome such documentation is, the better (Valanis 2003, S-prospective [3]).

McGowan (2010 S-survey [3]) describes a successful 'opt-out' model provided to all pregnant smokers in Glasgow. The 'opt-out' system means that all smokers are referred to one of two trained specialist advisors and receive a phone call. They can opt-out then.

Monitoring and feedback on performance help to initiate and maintain desirable practice (Hyndman 2005, S-RCT [3], Valanis 2003, S-prospective [3]). This has been achieved through survey and interviews with staff and using team meetings to discuss progress of services, give feedback and to allow problem solving among the providers. Permitting individual sites and departments to alter processes to meet with differing needs across different settings was also reported to be useful, so long as key personnel are kept abreast of such changes (Valanis 2003, S-prospective [3]).

Many UK services operate a system, which seems optimal given the current evidence. They train all midwives to provide brief advice and refer smokers for specialist treatment, provided mostly by dedicated advisors employed specifically to work with pregnant smokers (Battersby 2003, S-service audit [3]). Another more economical option is a referral to local 'mainstream' service (Taylor 2001, S-survey [3]).

The standard barriers to implementing smoking cessation systems in prenatal care (e.g. time constraints, lack of training, etc.) are equally applicable to the postnatal setting. On the topic of healthcare workers' fear of mothers' resistance to receiving advice, and the potential damage to their relationship, studies of postpartum interventions found that the majority of patients were receptive to advice and agreed it should be discussed (Groner 2005, S-service audit [3]; Wall 1995, S-RCT [3]; Winickoff 2010, S-RCT [3]). This is important because health visitors, MWs and

paediatricians might believe that women who did not manage to quit despite the motivation of pregnancy may be either 'untreatable' or simply unwilling to quit. In fact, such patients could be highly dependent and in need of specialist treatment. The addition of a single question about smoking status on mothers' post-partum medical records increased substantially referral rates to a quitline in the US. The effect lasted beyond the duration of study (Winickoff 2010, S-RCT [3]). The same study also found an increased referral of fathers to the quitline in response to including a question on paternal smoking status.

E.S. 2.1 The main barriers to MWs engaging with smokers include perceived lack of time and skills, belief that their advice is ineffective, and fear of damaging relationship with patients (Abatemarco 2007 [S-3], Aquilino 2003 [S-2], Beenstock 2012 [S-1], Bishop 1998 [S-2]), Cooke 1996 [S-3], Cooke 1998 [S-3], Cooke 2000 [S-2], Hartmann 2007 [S-2], Herberts 2012 [S-3], Jordan 2006 [S-2], Valanis 2003 [S-3]).

E.S. 2.2 Regarding the perception by MWs that discussing smoking can be perceived by pregnant smokers as 'nagging', smoking women generally accept that smoking should be discussed as part of maternity care in both the pre- and post-natal periods (Groner 2005 [S-3], Wall 1995 [S-3], Winickoff 2010 [S-3], Herberts 2012 [S-3]).

E.S. 2.3 Monitoring and feedback on performance help to initiate and maintain desirable practice (Hyndman 2005 [S-3], Valanis 2003 [S-3]).

E.S. 2.4 Simple referral systems that involve minimal time and effort from midwives, are conducive to improved rates of advice and referral (Hartmann 2007 [S-2], Valanis 2003 [S-3], Windsor 2000 [S-2]).

Training staff in stop-smoking interventions

Several studies evaluated staff training programmes. There is little evidence that such training improves cessation rate among patients. This is most likely because the training programmes focus on brief interventions which lack efficacy.

Albrecht (2011, S-retrospective [1]) trained staff in a US clinic in the 5As approach. A total of 144 smokers were recruited and 22 were 'able to abstain for at least part of the evaluation period'.

In a Dutch study, midwives were given an intervention manual, a prompt card, videos for clients, and either received training or not (this was not randomised). Midwives and clients were then asked to fill in questionnaires about practice. The trained midwives reported they provided interventions more frequently. Clients however did not corroborate this (Bakker 2003, S-survey [1]).

One study randomised hospitals to an intervention that aimed to increase adherence to clinical guidelines (academic detailing visits plus self-study package) or usual care. The intervention enhanced adherence to guidelines. It is not known if this had an effect on smoking cessation outcomes (Hyndman 2005, S-RCT [3]).

Lin (2003, S-service audit [NA]) reported on an intervention that trained staff in brief counselling. Pre-post analyses showed that training led to better records, but had no effect on smoking cessation rates among patients.

Wisborg (1998, S-RCT [1]) assessed the effect of training midwives on cessation using a quasi-random design. Training had no impact on cessation compared to non-trained midwives.

E.S. 2.5 Training midwives in providing stop smoking interventions themselves (as opposed to referrals to specialist treatment) has limited impact on quit rates. (Albrecht 2011 [S-1], Bakker 2003 [S-1], Hyndman 2005 [S-3], Lin 2003 [S-NA], Wisborg 1998 [S-1]).

Section 3: UK services for pregnant smokers

This is the key section of the present Chapter, because it covers the literature addressing specifically the provision of stop-smoking treatments in the UK setting.

From the year 2000, NHS-SSS received £3,000,000 per year to target pregnant smokers (Lee 2006). Two separate studies evaluated these dedicated pregnancy services. They generated a series of findings relevant for clinical guidelines.

Study 1 - Taylor (2001, S-survey [3])
When the initial funding was allocated to treat pregnant smokers, no guidelines or recommendations as to how this should be done were provided.

In 2001, the Health Development Agency commissioned a survey to examine how Health Authorities (HA) were using the funds, and to identify approaches which appear the most effective. At the time of the survey, England was divided into 99 HAs. All HAs responded to the initial short questionnaire. Thirty services that reported that they have been functioning for at least three months were visited and interviewed.

Staff: 25 services employed dedicated staff, the remaining 5 tried to include stop-smoking counselling in routine duties of all MWs.

Recruitment: Self-referrals via advertisements and GP referrals were unsuccessful. Asking MWs to verbally pass on client details to the advisors, and advisors waiting in antenatal clinics to pick up referrals opportunistically did not work either. The only approach which generated referrals consisted of midwives sending referral cards to advisors.

Treatment: 8 services were offering 1-3 sessions, 22 services offered 6+ sessions. Eleven services used ‘Stages of Change’ approach, 10 services used Withdrawal-Oriented Treatment, others used less common approaches generated by local enthusiasts including visualisation exercises, practicing stopping before the quit date, self-help books, and a computer-assisted package (purchased by the service for £25,000). 10 services gave pregnant smokers priority access to their mainstream clinics, rather than employing a separate advisor.

18 services used CO monitors, the rest felt that this implied mistrust in women, or did all sessions over the phone and had no face-to-face contact with smokers.

6 services did not use NRT, the others used it at least occasionally. They had to ask doctors to prescribe and this was sometimes refused. Interviewees felt that guidelines on NRT use in pregnancy are urgently needed.

Throughput and outcome: To calculate throughput and outcome, services data were scaled to the equivalent of one full-time staff member working for one year. Data problems were encountered which still persist. These included different definitions of outcome, inclusion of smokers who intended to quit or only smokers who actually made a quit attempt, 5 services reported as service successes all women who reported at the first contact with MW that they used to smoke but do not smoke any more (these 5 services were not included in figures below). One service did not ask smokers to set a quit date and only recorded a quit date if clients actually quit, resulting in 100% success rate. Another service had no figures at all.

Services with dedicated staff scaled to one full time advisor per year would treat 70 smokers per year (range 5-207) with 19 self-reported and 16 validated quitters at 4 weeks.

Two services were run by routine midwives expected to offer intermediate or intensive interventions (as opposed to brief one-off intervention). One could not provide interpretable data, in the other 21 women set a quit date and one managed self-reported abstinence at 4 weeks.

Intensive services set more quit dates (73 vs. 39) and generated more quitters (20 vs 9) than services using brief approaches.

Services run by advisors with other than MW background generated the same number of validated quitters as those where advisors were MWs (17 vs. 16).

The 10 services using mainstream clinics had lower throughput (17 vs. 42 women setting a quit date, with 6 vs. 11 self-reported 4-week quitters) but generated no extra cost.

Costs: The average staff salary cost per 4-week quitter was £3,309 (range £611 to £13,978), i.e. some £10,000+ per one-year quitter. This does not include management, medications, and running costs. It is not known how many of the women would quit smoking without SSS help.

Study 2 - Lee (2006, S-survey [3])

In 2004, the Health Development Agency commissioned another survey to identify examples of best practice in the by now fully developed field, with a view of developing guidance for practitioners.

As service reports were shown to have inconsistent reliability, the study involved a researcher familiar with both stop-smoking practices and with data collection and reporting methodology visiting the key sites to assess the quality of reported data and to describe practice details. Data were obtained from 245 PCTs. There were large differences in their reported throughput and outcome, suggesting differences not just in clinical practice but also in data reporting.

Two types of services were approached: Three services that reported the highest numbers of treatment successes in the DoH returns; and three services known in the field as examples of best practice, e.g. presenting at conferences and contributing to training initiatives ('beacon services').

Highest ranking services: The three highest scorers were marked by a combination of exceptionally high throughput (169 to 235 pregnant smokers treated per year) and success rates close to 100%. On closer examination it transpired that all three services counted women who reported at delivery to be smoking in the past but not now, as service successes. No useful lessons were derived from this other than a question mark about the accuracy of national data monitoring. One of these PCTs had a genuine dedicated service, with results similar to national average from the previous survey (51 smokers treated, 33% self-reported success rate at 4 weeks).

The beacon services: All three of these services provided genuinely exceptional output considerably above the national average found in the previous survey. They treated 120 – 267 smokers per year with 37% to 48% CO validated quit rates. The services differed in size (two of them covered 3 PCTs), staffing levels and other aspects of their activities, but they all shared several key elements, which were probably related to their success.

Recruitment: All three services received their referrals from local MWs. They all provided brief training sessions for MWs on how to refer pregnant smokers, rather than how to treat them. Two of them managed to make such training compulsory. All emphasized the crucial importance of having the full support of heads of midwifery. This corresponds with previous findings that relying on advertising to general public, self-referrals, and on trying to recruit smokers directly from surgeries is not productive.

Use of medications: All three services offered NRT to almost all pregnant smokers, and had an efficient system of providing the prescriptions. Although the evidence of NRT efficacy in pregnant smokers is lacking (see Review 2), it is possible that the efficacy is higher with intensive support. It is also likely that the presence of medication makes the service more attractive and stimulates confidence among both staff and patients.

Flexible home visits: All three services offered this. Although such provision is labour intensive, it was felt that it makes the services more attractive to users, and that it improves recruitment, patients' retention, and outcome. Inviting pregnant women to attend clinics generated a lower response.

Treatment format: All three services provided intensive multi-session treatment delivered by a small number of full-time staff. This tallies with previous findings that relying on brief advice by all primary care staff or training a large cohort of midwives to deliver interventions with their own patients is not productive.

The three services also differed in several aspects, as can be expected in an area where no practical guidance existed. Their data collection procedures and data quality differed, and there were large differences in costs. Scaled to common denominator, two full time advisors in one service were achieving the same results as four full time staff in another.

Other UK reports

We identified several other reports, which refer specifically to SSS.

McGowan (2010 S-survey [3]) describes a model service at 3 maternity units in Glasgow, which among them see some 12,000 pregnant women a year. The paper provides information about one reasonably successful model of the service. At maternity booking all women are expected to be asked by MWs to provide a CO reading. Smokers receive an 'opt-out' referral to one of two trained specialist advisors who provide NRT under PGD. The 'opt-out' system means that all smokers are referred and receive a phone call. They can opt-out then. Most other smoking cessation services for pregnant women are 'opt-in', i.e. women are asked if they want to be referred. One report suggests that about half accept the offer (Bryce 2009 S-prospective [3]). In the Glasgow service, the opt-out system generated a high rate of referrals. The added benefit of the system is the opportunity it provides for encouragement and motivation during the first telephone contact by a specialist. There were concerns that women may resent the phone calls, but the calls were generally well received and generated no complaints. The system is labour intensive – 2,500 telephone contacts were required for 370 women to join the treatment programme.

MWs had difficulty with including routine CO monitoring into their schedule. Compliance with CO monitoring was only 35%. However, in a hospital where this task was given to auxiliary nurses, 89% of women provided a breath sample.

Overall, of women referred, 19% (370) set a quit date and 117 (32%) were self-reported 4-week quitters. Treatment consisted of one face-to-face session followed by weekly phone calls. There was a concern that providing home visits is expensive and exposes midwives to at least the fear of assault from partners of pregnant smokers, particularly in areas of high deprivation.

A briefing paper by Jones (2012, Discussion [3]) provides an overview of the current service delivery in Wales. Core SSS is used rather than dedicated pregnancy advisors. Midwives refer pregnant smokers and specialist advisors contact clients twice by telephone, and send a letter if there is no response. Clients are fast tracked into an appointment to allow for the longest cessation period during their pregnancy. Clients are offered sessions for intensive support at existing community based groups, on a one to one basis at a clinic/venue where SSW usually hold sessions, or support over the phone. This seems to be an efficient and economical system, though the authors point out that women are not supported throughout their pregnancy and after delivery, and the service does not offer home visits. Regarding on-going 'maintenance' support, experience in the field suggests that very few clients attend follow-up appointments. Routine home visits by dedicated stop-smoking advisors are an expensive provision, unprecedented in behaviour change interventions, but they can enhance service reach.

Bryce (2009, S-prospective [3]) describes another Glasgow initiative (CATCH), which includes referrals of pregnant smokers to SSS by MWs. 152 smokers were referred during a 16-month period of whom 79 (52%) joined treatment. This time, treatment included home visits by trained MW who provided NRT under PGD. Treatment outcome was very good - 20% were validated abstainers at 3 months and 13% at 12 months.

The higher success rate of more intensive treatment tallies with the findings from randomised controlled trials. Such treatment, including home visits, was also provided by the 'beacon' services as described earlier.

E.S. 2.6 Within the UK NHS, the best results are associated with PCTs which provide the following: Organisational support; brief but compulsory training of all midwives to motivate smokers and refer them to SSS; specialist advisors offering multisession treatments accompanied by NRT; and provision of home visits where required (Bryce 2009 [S-3]; Lee 2006 [S-3]; McGowan 2010 [S-3]; Taylor 2001 [S-3]).

E.S. 2.7 There are two models of care. Referring pregnant smokers to advisors employed to work only with pregnant smokers, and referring to 'mainstream' SSS. The latter achieves the same success rate at lower cost, but the former generates higher throughput (Taylor 2001 [S-3]).

Comment

MWs and other health care staff are generally good at asking about smoking status of pregnant women, but they are less likely to engage in stop-smoking interventions. The common barriers include lack of time, knowledge and skills; belief that such interventions are ineffective; and concerns about damaging relationship with patients. MWs belief that their own brief interventions are not effective is actually probably an accurate perception. Review 2 reported that advice to pregnant smokers lack efficacy unless it is accompanied by extended multisession support.

Training MWs in providing stop-smoking interventions have not been shown productive. Training however influences practice, and training in encouraging and referring smokers (rather than in trying to treat them) seems to be a productive approach.

Most NHS SSS employ dedicated pregnancy advisors and they ask front-line midwives to motivate and refer smokers to the specialists rather than to provide treatment themselves.

The specialist pregnancy UK service started hesitantly. Lack of guidance meant that many local services were trying to implement approaches, which may appear sensible and economical, but were already known at the time to lack efficacy. The early experience was captured by an extensive survey, which confirmed the need for straightforward referral systems and specialist advisors. A later survey focused on best performing services. It identified a series of features associated with exceptional results. These included institutional support (i.e. collaboration of Heads of Midwifery to make MWs training and activities a routine part of their jobs), compulsory training of MWs in referring patients, provision of intensive multisession treatment by dedicated specialists, use of NRT (which may increase attractiveness of the service and confidence of patients and staff), and flexible home visits. Other publications covering UK services corroborate these findings.

Regarding the service configuration, most PCTs fund a dedicated pregnancy-only service, although some refer pregnant smokers to their mainstream services. The latter arrangement achieves the same success rate with little or no extra costs, but it generates a lower throughput. Recommending one approach over another depends on available funds and competing priorities. Perhaps both have their place within different local services.

Summary Statements

The review identified several barriers and facilitators of implementing evidence-based stop-smoking interventions in pregnancy.

1. **There are no serious barriers to recording smoking status of pregnant women and this is done generally well.**

2. **The main barriers to MWs engaging in stop-smoking interventions include perceived lack of time and skills, belief that their advice is ineffective, and fear of damaging relationship with patients**. The existence of UK-SSS has been instrumental in overcoming these barriers, as MWs can be asked just to motivate and refer smokers.

3. **Training all MWs to encourage and refer smokers to stop-smoking advisors is feasible and productive**. MWs are generally not keen to engage in stop-smoking interventions themselves, and training them to do so has not been shown to improve quit rates. In contrast, a number of PCTs have been successful in providing routine training to all MWs to motivate and refer smokers to SSS.

4. **The key features of successful NHS pregnancy services include organisational support, brief training of midwives in motivating and referring smokers, and provision of intensive multisession treatment by NHS-SSS specialists**. Dedicated pregnancy services have been funded by the NHS for the past 11 years. Two comprehensive surveys have evaluated their activities and they provide a wealth of data that can inform practical guidelines.

5. **There are two models of care. Referring pregnant smokers to advisors employed to work only with pregnant smokers, and referring to 'mainstream' SSS. The latter achieves the same success rate at lower cost, but the former generates higher throughput**

Overall Conclusion

Most of the existing world literature concerns health services with limited or no referral pathways to intensive treatments and it focuses on training front-line staff in brief routine interventions which are known to be ineffective. UK hospitals and maternity services have the option to refer smokers to specialist services and can in theory engage all staff in motivating and referring smokers. Such provision is currently in place in most maternity services. Within acute care however, this is not provided at all or provided inconsistently. The main barriers amenable to change include lack of organisational support, lack of clear referral pathways, and unrealistic training objectives.

References

References for included studies in chapter 1

ANON 2005. Nurses say their smoking affects patient care: some less likely to intervene with smoking patients. *Patient Education Management,* 12**,** 79-82.

ADRIAANSE, H. & VAN REEK, J. 1991. Tobacco prevention in hospitals needs prolonged and sustained effort. *British Journal Of Addiction,* 86**,** 703-704.

ADSIT, R., FRASER, D., REDMOND, L., SMITH, S. & FIORE, M. 2005. Changing clinical practice, helping people quit: the Wisconsin Cessation Outreach model. *WMJ: Official Publication Of The State Medical Society Of Wisconsin,* 104**,** 32-36.

AL-ALAWY, K., ROCHE, T. & ALWALI, W. 2011. Implementing public health in secondary care: a Rotherham perspective on strategy development and implementation. *Perspectives In Public Health,* 131**,** 137-143.

AZIZ, O., SKAPINAKIS, P., RAHMAN, S., RAO, C., ASHRAFIAN, H., PANESAR, S. S., DARZI, A., FOALE, R. & ATHANASIOU, T. 2009. Behavioural interventions for smoking cessation in patients hospitalised for a major cardiovascular event. *International Journal Of Cardiology,* 137**,** 171-174.

BALLBE, M., MONDON, S., NIEVA, G., WALTHER, M., SALTO, E. & GUAL, A. 2008. Evaluation of a training programme for health professionals on smoking cessation in hospitalized. *Adicciones,* 20**,** 125-129.

BARRERA, R., SHI, W., AMAR, D., THALER, H. T., GABOVICH, N., BAINS, M. S. & WHITE, D. A. 2005. Smoking and timing of cessation: impact on pulmonary complications after thoracotomy. *CHEST,* 127**,** 1977-1984.

BATLLE, E., BOIXET, M., AGUDO, A., ALMIRALL, J. & SALVADOR, T. 1991. Tobacco prevention in hospitals: long-term follow-up of a smoking control programme. *British Journal Of Addiction,* 86**,** 709-717.

BECKER DM, C. H., WARANCH HR, STILLMAN F, PENNINGTON L, LEES PS, OSKI F. 1989. The impact of a total ban on smoking in the Johns Hopkins Children's Center. . *JAMA,* Aug.

BIALOUS, S. A., SARNA, L., WEWERS, M. E., FROELICHER, E. S. & DANAO, L. 2004. Nurses' perspectives of smoking initiation, addiction, and cessation. *Nursing Research,* 53**,** 387-395.

BICKERSTAFFE, G. 2008. Hospital based smoking cessation proactive including pre-operative assessment. *The National Institute for Health and Clinical Excellence.*

BITTON, A. 2009. Intensive smoking cessation programs for hospitalized coronary patients: a proven intervention in need of implementation. *Journal of Clinical Outcomes Management,* 16**,** 398-400.

BLAKE H, M. S., MO PK, PISANO C. 2011. 'Do as say, but not as I do': are next generation nurses role models for health? *Perspect Public Health.,* 131**,** 231-9.

BOYLE, R., SOLBERG, L. & FIORE, M. 2011. Use of electronic health records to support smoking cessation. *Cochrane Database of Systematic Reviews* [Online]. Available: http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD008743/frame.html.

BRYANT, S. K. 2008. Smoking cessation strategies by nurses in an acute care setting. *Journal For Nurses In Staff Development: JNSD: Official Journal Of The National Nursing Staff Development Organization,* 24**,** 31-35.

CARSON KV, V. M., CRONE MR, BRINN MP, ESTERMAN AJ, ASSENDELFT WJJ, SMITH BJ 2012. Training health professionals in smoking cessation (Review). *The Cochrane Collaboration*.

CHAN, K. G., UPI, H., GANI, R. & CHANG, K. H. 2011. Paediatric ward nurses' action intentions and attitudes towards quit smoking interventions and their knowledge on second-hand smoke. *International Journal of Nursing Practice,* 17**,** 181-186.

CHANG, H. C., ZIMMERMAN, L. H. & BECK, J. M. 1995. Impact of chart reminders on smoking cessation practices of pulmonary physicians. *American Journal Of Respiratory And Critical Care Medicine,* 152**,** 984-987.

COHEN, S. J. S., G.K., KATZ, B. P, DROOK, C.A., SMITH, D.M. 1989. Encouraging primary care physicians to help smokers quit. A randomised controlled trial. *Ann Intern Med,* 110**,** 648-52.

CORNUZ, J., HUMAIR, J.-P., SEEMATTER, L., STOIANOV, R., VAN MELLE, G., STALDER, H. & P√©COUD, A. 2002. Efficacy of resident training in smoking cessation: a randomized, controlled trial of a program based on application of behavioral theory and practice with standardized patients. *Annals Of Internal Medicine,* 136**,** 429-437.

FOLAND, S. S. 2000. Smoking cessation interventions for patients with heart disease. *Tobacco Control,* 9 Suppl 1**,** I59-I59.

FREUND, M., CAMPBELL, E., PAUL, C., SAKROUGE, R., LECATHELINAIS, C., KNIGHT, J., WIGGERS, J., WALSH, R. A., JONES, T., GIRGIS, A. & NAGLE, A. 2009a. Increasing hospital-wide delivery of smoking cessation care for nicotine-dependent in-patients: a multi-strategic intervention trial. *Addiction (Abingdon, England),* 104**,** 839-849.

FREUND, M., CAMPBELL, E., PAUL, C., SAKROUGE, R., MCELDUFF, P., WALSH, R. A., WIGGERS, J., KNIGHT, J. & GIRGIS, A. 2009b. Increasing smoking cessation care provision in hospitals: a meta-analysis of intervention effect. *Nicotine & Tobacco Research: Official Journal Of The Society For Research On Nicotine And Tobacco,* 11**,** 650-662.

GARRETT-SYMANSKI, K., SMITH, P. R., MCCABE, J., SAMUELS, B., FYFFE, L. & ROSA, U. 2005. Impact of an inpatient smoking cessation program preliminary outcomes. *Chest,* 128**,** 204S-205S.

GARRETT-SZYMANSKI, K. A., SMITH, P. R., MCCABE, J., SAMUELS, R., WILLIS, C., NAWAZ, I., RAFFERTY, M. & MATTHEWS, K. 2006. Inpatient smoking cessation programs (ISPCS) approaches to prompt identification of hospitalized smokers. *Chest,* 130**,** 268S-269S.

GELLER, A. C., BROOKS, D. R., WOODRING, B., OPPENHEIMER, S., MCCABE, M., ROGERS, J., TIMM, A., RESNICK, E. A. & WINICKOFF, J. P. 2011. Smoking cessation counseling for parents during child hospitalization: a national survey of pediatric nurses. *Public Health Nursing (Boston, Mass.),* 28**,** 475-484.

GLASSMAN, S. D., ANAGNOST, S. C., PARKER, A., BURKE, D., JOHNSON, J. R. & DIMAR, J. R. 2000. The effect of cigarette smoking and smoking cessation on spinal fusion. *Spine,* 25**,** 2608-2615.

GOLDSTEIN, M. G. 1999. Missed opportunities to assist hospitalized smokers. *American Journal Of Preventive Medicine,* 17**,** 317-318.

GOMM, M., LINCOLN, P., EGELAND, P. & ROSENBERG, M. 2002. Helping hospitalised clients quit smoking: a study of rural nursing practice and barriers. *The Australian Journal Of Rural Health,* 10**,** 26-32.

GOOD, M. J., FRAZIER, L. M., WETTA-HALL, R., ABLAH, E. & MOLGAARD, C. A. 2004. Kansas office-based nurses' evaluation of patient tobacco cessation activities. *Journal Of Community Health Nursing,* 21**,** 77-85.

GOSSELIN, M.-H., MAHONEY, M. C., CUMMINGS, K. M., LOREE, T. R., SULLIVAN, M., KING, B. A., WARREN, G. & HYLAND, A. 2011. Evaluation of an intervention to enhance the delivery of smoking cessation services to patients with cancer. *Journal Of Cancer Education: The Official Journal Of The American Association For Cancer Education,* 26**,** 577-582.

GRACE, D. M., PEDERSON, L., SPEECHLEY, K. N. & MCALPINE, D. 1990. A longitudinal study of smoking status and weight loss following gastroplasty in a group of morbidly obese patients. *International Journal Of Obesity,* 14**,** 311-317.

GROTH SS, W. B., KUSKOWSKI MA, HOLM- STROM AM, RUBINS JB, KELLY RF. 2009. Impact of preop- erative smoking status on postoperative compli- cation rates and pulmonary function test results 1-year following pulmonary resection for non- small cell lung cancer. . *Lung Cancer,* 64**,** 352-357.

HAILE, M. J., WIGGERS, J. H., D SPIGELMAN, A., KNIGHT, J., CONSIDINE, R. J. & MOORE, K. 2002. Novel strategy to stop cigarette smoking by surgical patients: pilot study in a preadmission clinic. *ANZ Journal Of Surgery,* 72**,** 618-622.

HAWKSHAW, B. A. & ZUO, Y. 2005. Audit of prescribed nicotine replacement therapy to hospital inpatients who smoke. *The Medical Journal Of Australia,* 182**,** 43-44.

HEATH, J., KELLEY, F. J., ANDREWS, J., CROWELL, N., CORELLI, R. L. & HUDMON, K. S. 2007. Evaluation of a tobacco cessation curricular intervention among acute care nurse practitioner faculty members. *American Journal Of Critical Care: An Official Publication, American Association Of Critical-Care Nurses,* 16**,** 284-289.

HILL, H. S., DIREKZE, S., HUSSEIN, S., BARMANIA, N., SAMUEL, J. T., MUKHERJEE, D. K. & YUNG, B. 2008. DOES INTENSE EDUCATION OF NURSING STAFF MAKE AN IMPACT ON SMOKING CESSATION ADVICE GIVEN TO INPATIENTS? *Thorax,* 63**,** A77-A77.

HODGSON, L., FAIRHURST, A., THORBURN, P., FREW, A. F. & DOFFMAN, S. R. 2011. Improving smoking cessation advice through the implementation of a quality improvement intervention. *Thorax,* 66**,** A118-A119.

HOPKINSON, N. S., ENGLEBRETSEN, C., COOLEY, N., KENNIE, K., LIM, M., WOODCOCK, T., LAVERTY, A., WILSON, S., ELKIN, S. L., CANEJA, C., FALZON, C., BURGESS, H., BELL, D. & LAI, D. 2011. Designing and implementing a COPD discharge care bundle. *Thorax,* 66.

HOUGHTON, C. S., MARCUKAITIS, A. W., SHIRK MARIENAU, M. E., HOOTEN, M., STEVENS, S. R. & WARNER, D. O. 2008. Tobacco intervention attitudes and practices among certified registered nurse anesthetists. *Nursing Research,* 57**,** 123-129.

HURT, R. D., CROGHAN, I. T., OFFORD, K. P., EBERMAN, K. M. & MORSE, R. M. 1995. Attitudes toward nicotine dependence among chemical dependence unit staff--before and after a smoking cessation trial. *Journal Of Substance Abuse Treatment,* 12**,** 247-252.

HUSSAIN, S. F., TJEDER-BURTON, S., CAMPBELL, I. A. & DAVIES, P. D. 1993. Attitudes to smoking and smoking habits among hospital staff. *Thorax,* 48**,** 174-175.

HYMOWITZ, N., SCHWAB, J., HADDOCK, C., PYLE, S., MOORE, G. & MESHBERG, S. 2005. The pediatric resident training on tobacco project: baseline findings from the Parent/Guardian Tobacco Survey. *Preventive medicine* [Online]. Available: http://www.mrw.interscience.wiley.com/cochrane/clcentral/articles/313/CN-00528313/frame.html.

KANNEGAARD, P. N., KREINER, S., GREGERSEN, P. & GOLDSTEIN, H. 2005. Smoking habits and attitudes to smoking 2001 among hospital staff at a Danish hospital--comparison with a similar study 1999. *Preventive Medicine,* 41**,** 321-327.

KATZ, A., GOLDBERG, D., SMITH, J. & TRICK, W. E. 2008. Tobacco, alcohol, and drug use among hospital patients: concurrent use and willingness to change.

Journal Of Hospital Medicine: An Official Publication Of The Society Of Hospital Medicine, 3**,** 369-375.

KLOSS, B. T., COONEY, D. R., HART, D. M., WOJCIK, S. & LAGACE, R. E. 2011. Effects of resident education on smoking cessation counseling in the emergency department. *Annals of Emergency Medicine,* 58**,** S280-S281.

KOPLAN, K. E., REGAN, S., GOLDSZER, R. C., SCHNEIDER, L. I. & RIGOTTI, N. A. 2008. A computerized aid to support smoking cessation treatment for hospital patients. *Journal Of General Internal Medicine,* 23**,** 1214-1217.

KOTZ, D., VAN, W., VAN, R., VAN, C. P. & WESSELING, G. J. 2008. Smoking cessation treatment by Dutch respiratory nurses: Reported practice, attitudes and perceived effectiveness. *Patient Education and Counseling,* 70**,** 40-49.

KURI, M., NAKAGAWA, M., TANAKA, H., HASUO, S. & KISHI, Y. 2005. Determination of the duration of preoperative smoking cessation to improve wound healing after head and neck surgery. *Anesthesiology,* 102**,** 892-896.

LANCASTER, T. & FOWLER, G. 2000. Training health professionals in smoking cessation. *Cochrane Database of Systematic Reviews***,** CD000214-NaN.

LINDSTROM, D., SADR AZODI, O., WLADIS, A., TONNESEN, H., LINDER, S., NOSELL, H., PONZER, S. & ADAMI, J. 2008. Effects of a perioperative smoking cessation intervention on postoperative complications: a randomized trial. *Annals Of Surgery,* 248**,** 739-745.

LIU, S. K., PRIOR, E., WARREN, C., BROWN, T., SNIDE, J. & BUTTERLY, J. R. 2010. Improving the quality of care for the hospitalized tobacco user--one institution's transformational journey. *Journal Of Cancer Education: The Official Journal Of The American Association For Cancer Education,* 25**,** 297-301.

LONGO, D. R., JOHNSON, J. C., KRUSE, R. L., BROWNSON, R. C. & HEWETT, J. E. 2001. A prospective investigation of the impact of smoking bans on tobacco cessation and relapse. *Tobacco Control,* 10**,** 267-272.

MALEK, S., MCLEAN, R. & WEBSTER, E. 2007. Analysis of recording and coding of smoking history for patients admitted to a regional hospital. *The Australian Journal of Rural Health,* 15**,** 65-66.

MAY, F. C., STOCKS, N. & BARTON, C. 2008. Identification of barriers that impede the implementation of nicotine replacement therapy in the acute cardiac care setting. *European Journal Of Cardiovascular Prevention And Rehabilitation: Official Journal Of The European Society Of Cardiology, Working Groups On Epidemiology & Prevention And Cardiac Rehabilitation And Exercise Physiology,* 15**,** 646-650.

MCCARTY, M. C., HENNRIKUS, D. J., LANDO, H. A. & VESSEY, J. T. 2001. Nurses' attitudes concerning the delivery of brief cessation advice to hospitalized smokers. *Preventive Medicine,* 33**,** 674-681.

MCDANIEL, A. M., KRISTELLER, J. L. & HUDSON, D. M. 1999. Chart reminders increase referrals for inpatient smoking cessation intervention. *Nicotine &*

Tobacco Research: Official Journal Of The Society For Research On Nicotine And Tobacco, 1**,** 175-180.

MOCHIZUKI, Y., WHILE, D. & CHARLTON, A. 1996. Medical students do not think they have authority to advise patients to stop smoking. *BMJ (Clinical Research Ed.),* 313**,** 48-49.

MOLLER, A. M., VILLEBRO, N., PEDERSEN, T. & T¯NNESEN, H. 2002. Effect of preoperative smoking intervention on postoperative complications: a randomised clinical trial. *Lancet* [Online]. Available: http://www.mrw.interscience.wiley.com/cochrane/clcentral/articles/602/CN-00371602/frame.html.

MONTNER, P., BENNETT, G. & BROWN, C. 1994. An evaluation of a smoking cessation training program for medical residents in an inner-city hospital. *Journal Of The National Medical Association,* 86**,** 671-675.

MYERS, K., HAJEK, P., HINDS, C. & MCROBBIE, H. 2011. Stopping smoking shortly before surgery and postoperative complications: a systematic review and meta-analysis. *Archives Of Internal Medicine,* 171**,** 983-989.

NAUDZIUNAS, A., JANKAUSKIENE, L., KALINAUSKIENE, E. & PILVINIS, V. 2005. Implementation of the patient education about cardiovascular risk factors into a daily routine of the Cardiology Unit of the hospital. *Preventive Medicine,* 41**,** 570-574.

NICHOLSON, J. M., HENNRIKUS, D. J., LANDO, H. A., MCCARTY, M. C. & VESSEY, J. 2000. Patient recall versus physician documentation in report of smoking cessation counselling performed in the inpatient setting. *Tobacco Control,* 9**,** 382-388.

O'DONOVAN, G. 2009. Smoking prevalence among qualified nurses in the Republic of Ireland and their role in smoking cessation. *International Nursing Review,* 56**,** 230-236.

OLIVE, K. E. & BALLARD, J. A. 1996. Changes in employee smoking behavior after implementation of restrictive smoking policies. *Southern Medical Journal,* 89**,** 699-706.

PALONEN, K. P., ALLISON, J. J., HEUDEBERT, G. R., WILLETT, L. L., KIEFE, C. I., WALL, T. C. & HOUSTON, T. K. 2006. Measuring resident physicians' performance of preventive care. Comparing chart review with patient survey. *Journal Of General Internal Medicine,* 21**,** 226-230.

PASSERA, A. 2010. Cardiac nurses give smokefree story to patients. *Kai Tiaki Nursing New Zealand,* 16**,** 33-34.

POWER, L., BROWN, N. S. & MAKIN, G. S. 1992. Unsuccessful outpatient counselling to help patients with peripheral vascular disease to stop smoking. *Annals Of The Royal College Of Surgeons Of England,* 74**,** 31-34.

PRATHIBA, B. V., TJEDER, S., PHILLIPS, C. & CAMPBELL, I. A. 1998. A smoking cessation counsellor: should every hospital have one? *The Journal Of The Royal Society For The Promotion Of Health,* 118**,** 356-359.

REID, R. D., MULLEN, K.-A., SLOVINEC D'ANGELO, M. E., AITKEN, D. A., PAPADAKIS, S., HALEY, P. M., MCLAUGHLIN, C. A. & PIPE, A. L. 2010. Smoking cessation for hospitalized smokers: an evaluation of the "Ottawa Model". *Nicotine & Tobacco Research: Official Journal Of The Society For Research On Nicotine And Tobacco,* 12**,** 11-18.

RIGOTTI, N. A., ARNSTEN, J. H., MCKOOL, K. M., WOOD-REID, K. M., SINGER, D. E. & PASTERNAK, R. C. 1999. The use of nicotine-replacement therapy by hospitalized smokers. *American Journal Of Preventive Medicine,* 17**,** 255-259.

SARNA, L., WEWERS, M. E., BROWN, J. K., LILLINGTON, L. & BRECHT, M. 2001. Barriers to tobacco cessation in clinical practice: report from a national survey on oncology nurses. *Nursing Outlook,* 49**,** 166-173.

SCHOFIELD, P. E. & HILL, D. J. 1999. How accurate is in-patient smoking status data collected by hospital admissions staff? *Australian And New Zealand Journal Of Public Health,* 23**,** 654-656.

SCHOFIELD, P. E., HILL, D. J., JOHNSTON, C. I. & STREETON, J. A. 1995. Do doctors stop giving quit-smoking advice when other programs are reaching their patients? *Medical Care,* 33**,** 161-169.

SEGAAR, D., BOLMAN, C., WILLEMSEN, M. & DE VRIES, H. 2007. Identifying determinants of protocol adoption by midwives: a comprehensive approach. *Health Education Research,* 22**,** 14-26.

SLATER P, M. G., FLEMING P & MCKENNA H 2006. Nurses' smoking behaviour related to cessation practice. . *Nursing Times* 102**,** 32-37.

STILLMAN, F. A., BECKER, D. M., SWANK, R. T., HANTULA, D., MOSES, H., GLANTZ, S. & WARANCH, H. R. 1990. Ending smoking at the Johns Hopkins Medical Institutions. An evaluation of smoking prevalence and indoor air pollution. *JAMA: The Journal Of The American Medical Association,* 264**,** 1565-1569.

THOMPSON, K. M., CASLIN, E. K., MURRAY, P., ZISSIMOS, J., NEWHOUSE, R. & YUNG, R. 2006. Barriers to implementing nurse initiated inpatient smoking cessation [Abstract]. *Proceedings of the American Thoracic Society* [Online]. Available: http://www.mrw.interscience.wiley.com/cochrane/clcentral/articles/201/CN-00636201/frame.html.

THY, T., BOKER, T., GALLEFOSS, F. & BAKKE, P. S. 2007. Hospital doctors' attitudes toward giving their patients smoking cessation help. *The Clinical Respiratory Journal,* 1**,** 30-36.

UZUNER, O., GOLDSTEIN, I., LUO, Y. & KOHANE, I. 2008. Identifying patient smoking status from medical discharge records. *Journal of the American Medical Informatics Association,* 15**,** 14-25.

VAUGHN, T. E., WARD, M. M., DOEBBELING, B. N., UDEN-HOLMAN, T., CLARKE, W. T. & WOOLSON, R. F. 2002. Organizational and provider

characteristics fostering smoking cessation practice guideline adherence: an empirical look. *The Journal Of Ambulatory Care Management,* 25**,** 17-31.

VEGA, S. & STOLARE, I. 2010. Smoking cessation education increases interventions in a New Zealand hospital: World No Tobacco Day revisited. *The New Zealand Medical Journal,* 123**,** 35-40.

VITAVASIRI, C. & PAUSAWASDI, S. 2010. Implementation of 100% smoke-free hospital in Thailand. *Journal Of The Medical Association Of Thailand = Chotmaihet Thangphaet,* 93**,** 860-864.

VOKES, N. I., BAILEY, J. M. & RHODES, K. V. 2006. "Should I give you my smoking lecture now or later?" Characterizing emergency physician smoking discussions and cessation counseling. *Annals Of Emergency Medicine,* 48**,** 406.

VON GARNIER, C., KOCHUPARACKAL, S., MIEDINGER, D., LEUPPI, J. R. D., TAMM, M., BATTEGAY, E. & ZELLER, A. 2008. Smoking cessation advice: Swiss physicians lack training. *Cancer Detection And Prevention,* 32**,** 209-214.

VON GARNIER, C., MEYER, M., LEUPPI, J. R., BATTEGAY, E. & ZELLER, A. 2010. Smoking cessation counselling: impact of chart stickers and resident training. *Swiss Medical Weekly,* 140**,** 175-180.

WALKER, N. M., MORRIS, S. A. C. & CANNON, L. B. 2009. The effect of pre-operative counselling on smoking patterns in patients undergoing forefoot surgery. *Foot And Ankle Surgery: Official Journal Of The European Society Of Foot And Ankle Surgeons,* 15**,** 86-89.

WALSH, S. E., SINGLETON, J. A., WORTH, C. T., KRUGLER, J., MOORE, R., WESLEY, G. C. & MITCHELL, C. K. 2007. Tobacco cessation counseling training with standardized patients. *Journal Of Dental Education,* 71**,** 1171-1178.

WANG, W. D. 1994. Feasibility and effectiveness of a stages-of-change model in cigarette smoking cessation counseling. *Journal of the Formosan Medical Association = Taiwan yi zhi* [Online]. Available: http://www.mrw.interscience.wiley.com/cochrane/clcentral/articles/582/CN-00113582/frame.html.

WARD, M., VAUGHN, E., UDEN-HOLMAN, T., DOEBBELING, N., CLARKE, R. & WOOLSON, F. 2002. Physician knowledge, attitudes and practices regarding a widely implemented guideline. *Journal of Evaluation in Clinical Practice,* 8**,** 155-162.

WARD, M. M., DOEBBELING, B. N., VAUGHN, T. E., UDEN-HOLMAN, T., CLARKE, W. R., WOOLSON, R. F., LETUCHY, E., BRANCH, L. G. & PERLIN, J. 2003. Effectiveness of a nationally implemented smoking cessation guideline on provider and patient practices. *Preventive Medicine,* 36**,** 265-271.

WARNER, D. O. 2009. Feasibility of tobacco interventions in anesthesiology practices: a pilot study. *Anesthesiology,* 110**,** 1223-1229.

WARNER, D. O., KLESGES, R. C., DALE, L. C., OFFORD, K. P., SCHROEDER, D. R., SHI, Y., VICKERS, K. S. & DANIELSON, D. R. 2011. Clinician-delivered intervention to facilitate tobacco quitline use by surgical patients. *Anesthesiology,* 114**,** 847-855.

WARNER, D. O., KLESGES, R. C., DALE, L. C., OFFORD, K. P., SCHROEDER, D. R., VICKERS, K. S. & HATHAWAY, J. C. 2008. Telephone quitlines to help surgical patients quit smoking patient and provider attitudes. *American Journal Of Preventive Medicine,* 35**,** S486-S493.

WARNER, D. O., SARR, M. G., OFFORD, K. P. & DALE, L. C. 2004. Anesthesiologists, general surgeons, and tobacco interventions in the perioperative period. *Anesthesia And Analgesia,* 99**,** 1766.

WARNER MA, D. M., TINKER JH. 1984. Preoperative cessation of smoking and pulmonary complications in coronary artery bypass patients. . *Anesthesiology,* 60**,** 380-383.

WARNER MA, O. K., WARNER ME, LENNON RL, CONOVER MA, JANSSON-SCHUMACHER U. 1989. Role of pre- operative cessation of smoking and other factors in postoperative pulmonary complications: a blinded prospective study of coronary artery by- pass patients. . *Mayo Clin Proc.,* 64**,** 609-616.

WATTS, S., CHRISSTOFFELS, P. & LEGGET, M. 2011. Improved intervention rates in a smoking cessation programme offered by nurses in CCU- An audit of 2008 and 2010 at Auckland City Hospital. *Heart Lung and Circulation,* 20**,** S230-S231.

WHYTE, R. E., WATSON, H. E. & MCINTOSH, J. 2006. Nurses' opportunistic interventions with patients in relation to smoking. *Journal Of Advanced Nursing,* 55**,** 568-577.

WICENTOWSKI, R. & SYDES, M. R. 2008. Using implicit information to identify smoking status in smoke-blind medical discharge summaries. *Journal of the American Medical Informatics Association,* 15**,** 29-32.

WILBER, S. T., SULLIVAN, A. F., GAETA, T. J., WALTERS, E. L., CAMARGO, C. A. & BOUDREAUX, E. D. 2011. Emergency department provider survey on tobacco cessation interventions. *Academic Emergency Medicine,* 18**,** S218-S219.

WILLAING, I. & LADELUND, S. 2004. Smoking behavior among hospital staff still influences attitudes and counseling on smoking. *Nicotine & Tobacco Research: Official Journal Of The Society For Research On Nicotine And Tobacco,* 6**,** 369-375.

WILLETT, G., HOOD, E., BURNS, K., SWETLICK, L., WILSON, M., LANG, A. & LEVINSON, H. 2009. Clinical faxed referrals to a tobacco quitline: Reach, enrollment, and participant characteristics. *American Journal of Preventive Medicine,* 36**,** 337-340.

WILLIAMS, S. C., MORTON, D. J., JAY, K. N., KOSS, R. G., SCHROEDER, S. A. & LOEB, J. M. 2005. Smoking cessation counseling in U.S. Hospitals: A comparison of high and low performers. *Journal of Clinical Outcomes Management,* 12**,** 345-352.

WILSON, D. M., GELLATLY-FREY, H. & BAUMAN, H. C. 1998. Initial experience of McMaster SmokeStop. Smoking Cessation Clinic at McMaster Family Practice Unit. *Canadian Family Physician M√©decin De Famille Canadien,* 44**,** 1310-1318.

WOLFENDEN, L., DALTON, A., BOWMAN, J., KNIGHT, J., BURROWS, S. & WIGGERS, J. 2007. Computerized assessment of surgical patients for tobacco use: accuracy and acceptability. *Journal of Public Health,* 29**,** 183-186.

WOLFENDEN, L., WIGGERS, J., CAMPBELL, E. & KNIGHT, J. 2008. Pilot of a preoperative smoking cessation intervention incorporating post-discharge support from a Quitline. *Health Promotion Journal Of Australia: Official Journal Of Australian Association Of Health Promotion Professionals,* 19**,** 158-160.

WOLFENDEN, L., WIGGERS, J., CAMPBELL, E., KNIGHT, J., KERRIDGE, R. & SPIGELMAN, A. 2009. Providing comprehensive smoking cessation care to surgical patients: the case for computers. *Drug And Alcohol Review,* 28**,** 60-65.

WOLFENDEN, L., WIGGERS, J., KNIGHT, J., CAMPBELL, E., SPIGELMAN, A., KERRIDGE, R. & MOORE, K. 2005. Increasing smoking cessation care in a preoperative clinic: a randomized controlled trial. *Preventive Medicine,* 41**,** 284-290.

XIAO, D., WANG, C., CHEN, H. & HAJEK, P. 2011. Establishing smoke-free hospitals in china: Pilot study in 41 hospitals. *Respirology,* 16.

ZHANG, H., ALEXANDER, J. A., LUTTRELL, J., O'CONNOR, G. T., DALEY, J. & PARIS, M. 2005. Data feedback and clinical process improvement in acute myocardial infarction. *American Heart Journal,* 149**,** 856-861.

References for included studies in chapter 2

ABATEMARCO, D. J., STEINBERG, M. B. & DELNEVO, C. D. 2007. Midwives' knowledge, perceptions, beliefs, and practice supports regarding tobacco dependence treatment. *Journal Of Midwifery & Women's Health,* 52**,** 451-457.

ABRAHAMSSON, A., SPRINGETT, J., KARLSSON, L., H. KANSSON, A. & OTTOSSON, T. 2005. Some lessons from Swedish midwives' experiences of approaching women smokers in antenatal care. *Midwifery,* 21**,** 335-345.

ALBRECHT, S., KELLY-THOMAS, K., OSBORNE, J. W. & OGBAGABER, S. 2011. The SUCCESS Program for Smoking Cessation for Pregnant Women. *Journal Of Obstetric, Gynecologic, And Neonatal Nursing: JOGNN / NAACOG,* 40**,** 520-531.

AQUILINO, M. L., GOODY, C. M. & LOWE, J. B. 2003. WIC providers' perspectives on offering smoking cessation interventions. *MCN. The American Journal Of Maternal Child Nursing,* 28**,** 326-332.

BAKKER, M. J., DE VRIES, H., MULLEN, P. D. & KOK, G. 2005. Predictors of perceiving smoking cessation counselling as a midwife's role: a survey of Dutch midwives. *European Journal Of Public Health,* 15**,** 39-42.

BAKKER, M. J., MULLEN, P. D., DE VRIES, H. & VAN BREUKELEN, G. 2003. Feasibility of implementation of a Dutch smoking cessation and relapse prevention protocol for pregnant women. *Patient Education And Counseling,* 49**,** 35-43.

BATTERSBY, T. A., FENDALL, L. & POUGHER, C. 2003. Self help smoking cessation in pregnancy. What does work in Doncaster. *BMJ (Clinical Research Ed.),* 326**,** 446-446.

BEENSTOCK, J., SNIEHOTTA, F.F., WHITE, M., BELL, R., MILNE, E AND ARAUJO-SOARES, J. 2012. What helps and hinders midwives in engaging with pregnant women about stopping smoking? A cross-sectional survey of perceived implementation difficulties among midwives in the northeast of England. *Implementation Science* 7.

BISHOP, S., PANJARI, M., ASTBURY, J. & BELL, R. 1998. "A survey of antenatal clinic staff: some perceived barriers to the promotion of smoking cessation in pregnancy". *Australian College of Midwives Incorporated journal* [Online]. Available: http://www.mrw.interscience.wiley.com/cochrane/clcentral/articles/017/CN-00000017/frame.html.

BRYCE, A., BUTLER, C., GNICH, W., SHEEHY, C. & TAPPIN, D. M. 2009. CATCH: development of a home-based midwifery intervention to support young pregnant smokers to quit. *Midwifery,* 25**,** 473-482.

BULL, L. 2007. Smoking cessation intervention with pregnant women and new parents (part 2): A focus group study of health visitors and midwives working in the UK. *Journal of Neonatal Nursing,* 13**,** 179-185.

COOKE, M. 2000. The dissemination of a smoking cessation program: Predictors of program awareness, adoption and maintenance. *Health Promotion International,* 15**,** 113-124.

COOKE, M., MATTICK, R. P. & BARCLAY, L. 1996. Predictors of brief smoking intervention in a midwifery setting. *Addiction (Abingdon, England),* 91**,** 1715-1725.

COOKE, M., MATTICK, R. P. & CAMPBELL, E. 1998. The influence of individual and organizational factors on the reported smoking intervention practices of staff in 20 antenatal clinics. *Drug And Alcohol Review,* 17**,** 175-185.

COOKE, M., MATTICK, R. P. & CAMPBELL, E. 1999. The dissemination of a smoking cessation program to 23 antenatal clinics: the predictors of initial program adoption by managers. *Australian and New Zealand journal of public health* [Online]. Available: http://www.mrw.interscience.wiley.com/cochrane/clcentral/articles/911/CN-00160911/frame.html.

GRONER, J., FRENCH, G., AHIJEVYCH, K. & WEWERS, M. E. 2005. Process evaluation of a nurse-delivered smoking relapse prevention program for new mothers. *Journal Of Community Health Nursing,* 22**,** 157-167.

HARTMANN, K. E., WECHTER, M. E., PAYNE, P., SALISBURY, K., JACKSON, R. D. & MELVIN, C. L. 2007. Best practice smoking cessation intervention and resource needs of prenatal care providers. *Obstetrics And Gynecology,* 110**,** 765-770.

HASSEL, H. & VON, O. 2007. Training for midwives in motivational interviewing: Tailored intervention for smoking cessation in pregnancy. *Journal of Public Health,* 15**,** 441-445.

HERBERTS, C. & SYKES, C. 2012. Midwives' perceptions of providing stop-smoking advice and pregnant smokers' perceptions of stop-smoking services within the same deprived area of london. *Journal Of Midwifery & Women's Health,* 57**,** 67-73.

HERZIG, K., HUYNH, D., GILBERT, P., DANLEY, D. W., JACKSON, R. & GERBERT, B. 2006. Comparing prenatal providers' approaches to four different risks: alcohol, tobacco, drugs, and domestic violence. *Women & Health,* 43**,** 83-101.

HYNDMAN, K. J. 2005. An evaluation of a dissemination intervention to enhance registered nurses' use of clinical practice guidelines related to tobacco reduction. NaN.

JONES, S., TYLER, E., BRASSEY, J., DE SOUZA, S., REILLY, R., PARANJOTHY, S. 2012. Smoking in Pregnancy: Briefing Paper. Reproductive and Early Years Pathfinder Project. *Public Health Wales*.

JORDAN, T. R., DAKE, J. A. & PRICE, J. H. 2006. Best practice for smoking cessation in pregnancy: Do obstetrician/gynecologists use them in practice? *Journal of Women's Health,* 15**,** 400-411.

LEE, M., HAJEK, P., MCROBBIE, H. & OWEN, L. 2006. Best practice in smoking cessation services for pregnant women: results of a survey of three services reporting the highest national returns, and three beacon services. *The Journal Of The Royal Society For The Promotion Of Health,* 126**,** 233-238.

LIN, L. P. M. C., GALVIN, S. L. & DIXON, S. D. 2003. Smoking cessation in an Ob/Gyn residency clinic. *Primary Care Update for Ob/Gyns,* 10**,** 265-269.

MANTZARI, E., VOGT, F. AND MARTEAU, T 2012. The effectiveness of financial incentives for smoking cessation during pregnancy: is it from being paid or from the extra aid? *Eleni Mantzari, Florian Vogt and Theresa M Marteau,* BMC Pregnancy and Childbirth 24.

MCGOWAN, A., HAMILTON, S., BARNETT, D., NSOFOR, M., PROUDFOOT, J. & TAPPIN, D. M. 2010. 'Breathe': the stop smoking service for pregnant women in Glasgow. *Midwifery,* 26**,** e1-e13.

OWEN, L. & MCNEILL, A. 2001. Saliva cotinine as indicator of cigarette smoking in pregnant women. *Addiction (Abingdon, England),* 96**,** 1001-1006.

SHIPTON, D., TAPPIN, D. & VADIVELOO, T. 2009. Reliability of self reported smoking status by pregnant women for estimating smoking prevalence: a retrospective, cross-sectional study. *BMJ,* 339.

TAYLOR TR, H. P. 2001. Smoking Cessation Services for Pregnant Women. Survey of English Health Authorities. . *Report to Health Development Agency. London.*

VALANIS, B., LABUHN, K. T., STEVENS, N. H., LICHTENSTEIN, E. & BRODY, K. K. 2003. Integrating prenatal-postnatal smoking interventions into usual care in a health maintenance organization. *Health Promotion Practice,* 4**,** 236-248.

VAN, T. F. M., BOERSMA, H., DE, D., DECKERS, J. W. & WOOD, D. 1999. Registration and management of smoking behaviour in patients with coronary heart disease. *European Heart Journal,* 20**,** 1630-1637.

VELASQUEZ, M. M., HECHT, J., QUINN, V. P., EMMONS, K. M., DICLEMENTE, C. C. & DOLAN-MULLEN, P. 2000. Application of motivational interviewing to prenatal smoking cessation: training and implementation issues. *Tobacco Control,* 9 Suppl 3**,** III36-III40.

WALL, M. A., SEVERSON, H. H., ANDREWS, J. A., LICHTENSTEIN, E. & ZOREF, L. 1995. Pediatric office-based smoking intervention: impact on maternal smoking and relapse. *Pediatrics,* 96**,** 622-628.

WALSH, R. A., REDMAN, S. & ADAMSON, L. 1996. The accuracy of self-report of smoking status in pregnant women. *Addictive Behaviors,* 21**,** 675-679.

WHITWORTH, M. & DOWSWELL, T. 2009. Routine pre-pregnancy health promotion for improving pregnancy outcomes. *Cochrane Database of Systematic Reviews* [Online]. Available: http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD007536/frame.html.

WINDSOR, R. A., WHITESIDE, H. P., JR., SOLOMON, L. J., PROWS, S. L., DONATELLE, R. J., CINCIRIPINI, P. M. & MCILVAIN, H. E. 2000. A process evaluation model for patient education programs for pregnant smokers. *Tobacco Control,* 9 Suppl 3**,** III29-III35.

WINICKOFF, J. P., HEALEY, E. A., REGAN, S., PARK, E. R., COLE, C., FRIEBELY, J. & RIGOTTI, N. A. 2010. Using the postpartum hospital stay to address mothers' and fathers' smoking: the NEWS study. *Pediatrics,* 125**,** 518-525.

WISBORG, K., HENRIKSEN, T. B. & SECHER, N. J. 1998. A prospective intervention study of stopping smoking in pregnancy in a routine antenatal care setting. *British Journal Of Obstetrics And Gynaecology,* 105**,** 1171-1176.

References for additional studies

Bittoun R, McMahon M, Bryant DH. Smoking in hospitalised patients. *Addictive Behaviors* 1991;16(1-2):79-81.

Bluman LG, Mosca L, Newman N, Simon DG. Preoperative smoking habits and postoperative pulmonary complications.[see comment]. *Chest* 1998;113(4):883-9.

Furlong C. Preoperative smoking cessation: a model to estimate potential short term health gain and reductions in length of stay. London: London Health Observatory, 2005.

Khan MA, Hussain SF, Khan MA, Hussain SF. Pre-operative pulmonary evaluation. *Journal of Ayub Medical College, Abbottabad: JAMC* 2005;17(4):82-6.

McRobbie H, Hajek P, Feder G, Eldridge S. A cluster-randomised controlled trial of a brief training session to facilitate general practitioner referral to smoking cessation treatment. *Tobacco Control*. 2008;17(3):173-6.

Woodward M, Tunstall-Pedoe H. Biochemical evidence of persistent heavy smoking after a coronary diagnosis despite self-reported reduction: analysis from the Scottish Heart Health Study. *European Heart Journal* 1992;13(2):160-5.

References for excluded studies

2011. Nurses need new skills to help patients who smoke. *Kai Tiaki Nursing New Zealand,* 17**,** 6-7.

BECH, J., HELQVIST, S., HANSEN, H., FRIIS, J., JACOBSEN, J. & HILDEBRANDT, P. R. 1999. [Secondary prevention of ischemic heart disease. A questionnaire study and suggestions to improved cooperation between hospitals and general practice]. *Ugeskrift For Laeger,* 161**,** 3650-3654.

BISHOP, S., PANJARI, M. & ASTBURY, J. 1999. A survey of antenatal clinic staff: some perceived barriers to the promotion of smoking cessation in pregnancy. *MIDIRS Midwifery Digest,* 9.

CUMMINGS SR, C. T., RICHARD RJ, HANSEN B, ZAHND EG, VANDER MARTIN R, ET AL.T 1989a. raining physicians in counseling about smoking cessation. A randomized trial of the “Quit for Life” program. . *Ann Intern Med,* 110**,** 640-7.

CUMMINGS SR, R. R., DUNCAN CL, HANSEN B, VANDER MARTIN R, GERBER B, ET AL. 1989b. Training physicians about smoking cessation: a controlled trial in private practice. . *J Gen Intern Med* 4**,** 482-9.

HAFSTAD, A. & IVERSEN, O. E. 1995. [Smoking-free environment in the Norwegian delivery institutions--where are we now?]. *Tidsskrift For Den Norske Logeforening: Tidsskrift For Praktisk Medicin, Ny Rokke,* 115**,** 2110-2113.

HASUO, S., TANAKA, H., WAKISAKA, S., YUASA, M., TOMONARI, K. & OSHIMA, A. 2004. [Efficacy of nurses' on the job training to better advise cessation among hospitalized smokers]. *[Nihon K≈çsh≈´ Eisei Zasshi] Japanese Journal Of Public Health,* 51**,** 496-506.

HEGAARD, H. K., KJAERGAARD, H., M¯LLER, L. F., WACHMANN, H. & OTTESEN, B. 2003. Multimodal intervention raises smoking cessation rate during pregnancy. *Acta obstetricia et gynecologica Scandinavica* [Online]. Available: http://www.mrw.interscience.wiley.com/cochrane/clcentral/articles/299/CN-00450299/frame.html.

HOUSTON, T. K., SADASIVAM, R. S., FORD, D. E., RICHMAN, J., RAY, M. N. & ALLISON, J. J. 2010. The QUIT-PRIMO provider-patient Internet-delivered smoking cessation referral intervention: a cluster-randomized comparative effectiveness trial: study protocol. *Implementation Science: IS,* 5**,** 87-87.

JIMONEZ RUIZ, C. A., SOLANO REINA, S., FLOREZ, S., RAMOS, A. & RAMOS, L. 1994. [The nicotine patch. Short-term results in a group of hospital workers]. *Revista Clinica Espanola,* 194**,** 477-479.

KOTTKE, E. 1998. Observing the delivery of smoking-cessation interventions. *American Journal of Preventive Medicine,* 14**,** 71-72.

LENNOX, A., BAIN, N. & TAYLOR, R. 1998. Stages of Change training for opportunistic smoking intervention by the primary health care team, part 1: randomised controlled trial of the effect of training on patient smoking outcomes and health professional behaviour as recalled by patients. *Health Education J,* 57.

SINCLAIR HK, B. C., LENNOX AS, SILCOCK J, WINFIELD AJ, DONNAN PT. 1998. Training pharmacists and pharmacy assistants in the stage-of-change model of smoking cessation: a randomised controlled trial in Scotland. . *Tob Control* 7**,** 253-261.

STRECHER, V. J., O'MALLEY, M. S., VILLAGRA, V. G., CAMPBELL, E. E., GONZALEZ, J. J., IRONS, T. G., KENNEY, R. D., TURNER, R. C., ROGERS, C. S. & LYLES, M. F. 1991. Can residents be trained to counsel patients about quitting smoking? Results from a randomized trial. *Journal Of General Internal Medicine,* 6**,** 9-17.

WAGNER, P. J., JESTER, D. M. & MOSELEY, G. C. 2002. Medical students as health coaches. *Academic Medicine: Journal Of The Association Of American Medical Colleges,* 77**,** 1164-1165.

WOLFENDEN, L., WIGGERS, J., CAMPBELL, E., KNIGHT, J., KERRIDGE, R., MOORE, K., SPIGELMAN, A. & HARRISON, M. 2008. Feasibility, acceptability, and cost of referring surgical patients for postdischarge cessation support from a quitline. *Nicotine & Tobacco Research: Official Journal Of The Society For Research On Nicotine And Tobacco,* 10**,** 1105-1108.

Appendices

Appendix 1: Review Protocol for Reviews 2 & 3

Overview of project

The National Institute for Health and Clinical Excellence (NICE) has been asked by the Department of Health to develop two separate pieces of complementary guidance on:

- 'Smoking cessation in secondary care: acute and maternity services'
- 'Smoking cessation in secondary care: mental health services'.

The guidance will address smokefree policies and smoking cessation and make recommendations on approaches to help secondary care commissioners, professionals and managers (including patients and service users and their family or carers, visitors and staff) in hospitals and other acute, maternity or mental healthcare settings (including emergency care, planned specialist medical care or surgery, and maternity care provided in hospitals, outpatient clinics, community outreach and rural units, as well as intensive services in psychiatric units and secure hospitals).

There are five components of work associated with the guidance development:

1. Smoking cessation in acute and obstetric services: one review of effectiveness and one review of barriers and facilitators (reviews 2 & 3).
2. Smoking cessation in mental health services: one review of effectiveness and one review of barriers and facilitators (reviews 4 & 5).
3. Smokefree strategies and interventions in secondary care settings: one review of effectiveness and one review of barriers and facilitators (reviews 6 & 7).
4. An economic analysis (cost effectiveness review and economic model)
5. Review of effects of nicotine in secondary care (review 1)

The CPHE has commissioned the National Centre for Smoking Cessation and Training (NCSCT) to deliver four of these components (1,2,3 and 5).

This review protocol sets out the process for Component One - Smoking cessation in acute and maternity services: one review of effectiveness (review 2) and one review of barriers and facilitators (review 3).

Review 3: Barriers & facilitators for smoking cessation interventions in acute & maternity services

The aim of these reviews is to answer key questions as set out in the final scope document for the guidance on 'Smoking cessation in secondary care: acute and maternity services'.

The Review Team

This review will be led by Miss Katie Myers. She has led a NICE review of Relapse Prevention Interventions in Pregnancy[1] and was the lead author on the Pre-operative Smoking Cessation systematic review[2]. Ms Myers has experience in searching literature for systematic reviews and project management. Professor Hajek will lead on the writing of the review. He has a long history of working with NICE and extensive experience in systematic reviews[1-6]. Dr McRobbie will assist the Project Team with literature screening and quality appraisal. He has led on a NICE systematic review (see McRobbie et al 2006[3]) and is an author of two Cochrane Systematic Reviews[7] [8] and another recent systematic review[2]. Dr McRobbie was also a lead author of the literature review for the New Zealand Smoking Cessation Guidelines[9].

Mr Nigel Chee will provide expert project management support to the Project Team given the tight timeframes for this Component. He is an experienced manager with experience in managing large and complex health research, strategy, policy and implementation projects. He is also a co-author of the Clinical Guidelines for Weight Management in New Zealand Adults and the Clinical Guidelines for Weight Management in New Zealand Children[10]. He will primarily focus on driving the process for the project to ensure timelines are met and will also manage the relationships between the key stakeholders (including the Project Team, Independent Information Specialist, collaborators, NCSCTC CIC and NICE).

Independent Information Specialist

In addition to the skills and experience of the Project Team an independent information specialist (Ms Claire Stansfield) from the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) will provide advice on the search strategy and the approach to undertaking the literature search. Ms. Stansfield has extensive expertise in methods for identifying research for systematic reviews, is familiar with the syntax requirements of the databases used in NICE systematic reviews, and is a member of the Cochrane Collaboration's Information Retrieval Methods Group.

Collaborators

This review will also involve several other collaborators (listed below) who are leading components 2 and 3. The rationale for involving these wider collaborators is that we believe there are significant overlaps between the four components.

Although each component "stands alone", we believe that working as a broader collective team will enable synergies across the work to be completed. The wider team is multi-disciplinary consisting of health and clinical psychologists, clinicians, research nurses, epidemiologists and medical statisticians and covers a wide range of specialist technical expertise including mental health care, secondary care and tobacco control research.

- Professor Ann McNeill (University of Nottingham);
- Dr Jo Leonardi-Bee (University of Nottingham);
- Dr Rachael Murray (University of Nottingham);
- Dr Elena Ratschen (University of Nottingham);
- Professor Sarah Lewis (University of Nottingham);
- Ms Kathryn Angus (University of Stirling); and
- Mr Douglas Eadie (University of Stirling).

The review process

This review will involve the following steps, which are described further within this protocol.

1) Searching and retrieval of relevant evidence/studies as outlined in the search protocol and strategy (see Appendix 1)
2) Selecting relevant evidence/studies using appropriate title/abstract screening checklists (see Appendix 2). Titles/abstracts will be screened independently by two reviewers.
3) Retrieval of full papers assessed to be potentially relevant following title/abstract screening.
4) Full papers will be screened independently by two reviewers and quality assessed using the NICE quality appraisal checklists (see Appendices 4-6).
5) Data will be extracted from each paper and entered into data extraction tables (see Appendices 7 & 8).
6) Data will be collated and presented in evidence tables, narrative summaries, summary tables, graphical presentation, and meta-analysis where appropriate. Sensitivity analyses related to inequality measures will be carried out, where possible.
7) Evidence statements and applicability statements will be formulated.

Project deliverables

Review 2

At the completion of this process the review team will:

1 Submit a **1st draft of the review** to the NICE Team by 16 March 2012
2 Undertake any amendments to the draft following NICE comments and provide a revised draft (**2nd draft**) by 9 April 2012

3 Present the review findings to the PDG meeting on 25 April 2012
4 Undertake any amendments to the reviews following comment from the PDG and summit a **3rd draft by** 8 May 2012
5 Provision of written contributions and technical support during and after the completion of the reviews, as required during the development of the public health programme guidance. This will include:
   - Supporting the NICE Team in responding to any stakeholder comments on the reviews during the consultation on the evidence and draft guidance (consultation is currently planned for April to July 2013).
   - Attendance at PDG meetings as required (dates for these meetings are outlined in Annex 2).
6 Submit the **final review** following public consultation, by 31 July 2013

Review 3

At the completion of this process the review team will:

7 Submit a **1st draft of the review** to the NICE Team by 4 May 2012
8 Undertake any amendments to the draft following NICE comments and provide a revised draft (**2nd draft**) by 28 May 2012
9 Present the review findings to the PDG meeting on 13 June 2012
10 Undertake any amendments to the reviews following comment from the PDG and summit a **3rd draft by** 25 June 2012
11 Provision of written contributions and technical support during and after the completion of the reviews, as required during the development of the public health programme guidance. This will include:
   - Supporting the NICE Team in responding to any stakeholder comments on the reviews during the consultation on the evidence and draft guidance (consultation is currently planned for April to July 2013).
   - Attendance at PDG meetings as required (dates for these meetings are outlined in Annex 2).
12 Submit the **final review** following public consultation, by 31 July 2013

Background

Hospitalisation provides a unique opportunity for people to stop smoking. Smokers who are admitted to hospital are often highly motivated to quit and the hospital setting provides a potentially supportive environment to do so. Hospitals are smokefree environments and admission brings people into direct contact with healthcare professionals who can advise on giving up smoking and offer evidence-based treatment.

Smoking cessation counselling delivered in an acute hospital setting, combined with follow-up support on discharge, seems to increase smoking cessation rates[11]. There are also data from systematic reviews to show that intensive smoking cessation interventions provided to pregnant women who smoke and delivered to people

awaiting surgery can be effective in increasing long-term cessation rates.[1](Lumley et al., 2009; Moller & Villebro, 2009) However, this opportunity is often missed. Abstaining from smoking often results in a tobacco withdrawal syndrome (TWS) that comprises of a number of changes such as mood alterations, physical symptoms and signs, as well as biochemical and physiological changes.[1](Hughes, 2007) Not all smokers who are hospitalised will experience TWS but for those who do these symptoms can be managed. Current pharmacotherapies for smoking cessation, in particular fast acting nicotine replacement therapy (NRT) products, can be effective in alleviating tobacco withdrawal symptoms[1(West & Shiffman, 2001)] and could be offered to assist patients to abstain during their hospital stay.

There seems to be a number of barriers to providing help to smokers in secondary care. For instance there is a widespread concern that stopping smoking shortly before surgery may have negative effects on surgery outcomes, hospital electronic records are often inflexible and make recording of patient smoking status difficult, staff do not see addressing smoking as a part of their core duties,. There is a need to systematically review not just the efficacy of stop smoking interventions, which are usually evaluated in a somewhat rarified research setting but also the barriers and facilitators of stop smoking activities in acute and maternity settings. There is a scope to systematically increase referrals and access to smoking cessation services across both acute and maternity hospital settings, which such a review could facilitate.

Aim

The review aims to address the research questions set out below.

Scope

Groups that will be covered

The review will include evidence from smokers of all ages who use acute and maternity services, including those who are in the process of being referred to hospital and those who have recently been discharged. The review will all also capture:

- People who live in the same household as someone who is using acute and maternity services, such as partners, parents and other family members and carers
- visitors to acute and maternity care settings

- staff working in acute or maternity care settings, in particular, those who have direct contact with people using the services (this includes support staff, volunteers, those working for agencies or as locums and people employed by contractors)

This review will not consider the following populations:

- users of primary care services;
- users of mental health services; and
- staff working in, and visitors to, secondary care mental health settings.

Activities / interventions that will be covered

This review will address the effectiveness and barriers and facilitators of smoking cessation interventions in acute and maternity services. This will include:

- Interventions that help the populations of interest stop smoking
- Interventions that help populations of interest temporarily abstain

Activities / interventions that will not be covered

This review will not consider evidence relating to cut down to quit programmes in acute and maternity care settings. It will also not consider evidence relating to interventions aimed at staff to improve identification and referral of smokers.

These reviews will not consider evidence relating to smoking cessation and temporary abstinence interventions in users of primary care services, mental health services and staff working in, and visitors to, secondary care mental health services.

PICO table to summarise the review scope
Population
The review will include evidence from smokers of all ages who use acute and maternity services, including those who are in the process of being referred to hospital and those who have recently been discharged. The review will all also capture any literature on: • People who live in the same household as someone who is using acute and maternity services, such as partners, parents and other family members and carers • visitors to acute and maternity care settings • staff working in acute or maternity care settings, in particular, those who have direct contact with people using the services (this includes support staff, volunteers, those working for agencies or as locums and

people employed by contractors)

Intervention/Activity

This review will address the effectiveness and barriers and facilitators of smoking cessation interventions in acute and maternity services. This will include

- Interventions that help people stop smoking
- Interventions that help people temporarily abstain

Comparison

Data comparing pharmacological interventions with placebo or control procedures including no intervention, usual practice, or which compares two or more intervention types.

Data comparing behavioural interventions including face-to-face, self-help, telephone and internet interventions with control procedures

Data comparing other treatments (e.g. alternative medicine) with control procedures

The above comparisons will cover all studies concerning smoking cessation and temporary abstinence.

Data providing information on barriers and facilitators to smoking cessation in hospital and maternity service settings

Outcomes

Review 2

The following factors and outcomes will be considered in review 2:

- the effectiveness of smoking cessation interventions in acute and maternity service settings
- the effectiveness of temporary abstinence interventions in acute and maternity service settings

The key outcomes will include Russell Standard abstinence rates (continuous validated long-term abstinence rates based on ITT analysis). Where such strict outcomes are not available, other measures of outcome will be taken into account (e.g. point-prevalence short term un-validated abstinence rates). Other outcomes will include use and uptake of stop-smoking services and medications, and adverse events.

Review 3

The following factors and outcomes will be considered in review 3:

- How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation in terms of post-discharge care, sharing information on patients smoking status, advice and help provided, treatment outcomes, and in using referral pathways to specialist treatment?
- What barriers and facilitators affect the delivery of effective interventions identified in review 2 from multiple perspectives?

Research questions

This review will attempt to answer the following six questions:

Question 1: How effective are smoking cessation interventions in helping people from the populations of interest?

Question 2: How effective are interventions for temporary abstinence in helping people from the populations of interest?

Question 3: How effective are the current approaches used by maternity care services to identify and refer smokers to stop-smoking services?

Question 4: How effective are the current approaches used by maternity care services to provide smokers with smoking cessation information, advice and support?

Question 5: How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation?

Question 6: What barriers and facilitators affect the delivery of effective interventions?

Literature search protocol

Aims

The aim of the literature search is to identify evidence on the effectiveness and barriers and facilitators of smoking cessation interventions in acute and maternity services in the population of interest (see section 4.1 for further details).

Search approach

Review 2

This review will use a systematic approach to identify literature of the highest quality available that provides information on:

a) the effectiveness of smoking cessation interventions in acute and maternity service settings

b) the effectiveness of temporary abstinence interventions in acute and maternity service settings

c) the effectiveness of current approaches used by maternity care services to identify and refer people to stop-smoking services, for example provided by public or private providers

d) the effectiveness of current approaches used by maternity care services to identify and provide smoking cessation information, advice and support, for example by a nurse or physician

e) the effective approaches to encourage maternity care professionals to record smoking status and refer to stop-smoking services

The review will also focus on literature that provides information on:

- how the effectiveness of interventions vary between different service users (including their family or people they live with), visitors and people that work in acute and maternity services and if they are more effective in combination
- deliverer, setting, timing, frequency duration and severity of dependence has on the impact and effectiveness of the intervention
- adverse events reported from smoking cessation and temporary abstinence interventions

Review 3

This review will use a systematic approach to identify literature that provides information on:

1. How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation, cessation in terms of sharing information on patient smoking status, advice and help provided, treatment outcomes, and in using referral pathways to specialist treatment?

2. What barriers and facilitators affect the delivery of effective interventions, for example the interventions identified in review 2?

The review will also focus on literature that provides information on:

- the views (knowledge, attitude, beliefs) of different population groups and service providers
- deliverer, setting, timing, frequency duration and severity of dependence has on the acceptability of the intervention
- adverse events reported from smoking cessation and temporary abstinence interventions

These reviews will not consider evidence relating to smoking cessation and temporary abstinence interventions in users of primary care services, mental health services and staff working in, and visitors to, secondary care mental health services. If a study concerns both primary and secondary care, evidence relevant to the search questions would be included.

Search questions

1: How effective are smoking cessation interventions in helping people from the populations of interest?

2: How effective are interventions for temporary abstinence in helping people from the populations of interest?

3: How effective are the current approaches used by maternity care services to identify and refer smokers to stop-smoking services?

4: How effective are the current approaches used by maternity care services to provide smokers with smoking cessation information, advice and support?

5: What are the barriers and facilitators to Joined up working / collaboration within or across settings, for example between primary and secondary care?

6: What barriers and facilitators affect the delivery of effective interventions?

Developing the search strategy

The main search strategy has been developed to capture the following:

(1) Review population and setting

The following search terms will be used

Patient admission/; hospitalization/; outpatients/ inpatients/; child, hospitalized/; adolescent, hospitalized/; Pregnant women/; patients/; patient#; (pregnant NS teens; teenager#; adolescent#; women; mothers); inpatient#, outpatient#; “out patients” inhospital; (day N2 patient#); ill patients; acutely ill; primip*; primigravid*; (patient# N2 surgery; operation; discharge#; readmission#; postdischarge#; emergency; emergencies; refer; refers; referral; referring; admit; admittance#; admitting; admission#; readmittance; readmitting; readmission#; postoperable; postoperative; admit; admits); maternity; maternal health; obstetrics; prenatal care; (“prenantal; antenatal; perinatal; obstetric; maternal AND service; services; clinic; clinics; health; healthcare”); hospitalised; hospitalized; secondary care; acute care; secondary health service; secondary health services; acute health service; acute health services; acute setting; acute settings; acute service; acute services; (acute; general; stay; staying W2 ward; wards); (accident; emergency; surgical; surgery; acute W unit; department); hospitals; hospital; (patient# N2 “post discharge”; maternal health services/; obstetric and gynecology department, hospital/; obstetrics/; hospitals+/; hospital units/; outpatient clinics, hospital/; emergency service, hospital; emergency medical services/; hospital staff/personnel/ W1 worker#; surgeon#; gyne#cologist#; obstetrician#; midwiv#; midwife; doctor#; nurse#; physician#; clinician#; pharmacist#; health W1 worker#; consultant#; medical W1 specialist#; medical W1 officer#

(2) Tobacco use

Tobacco use cessation/; Tobacco use disorder/; Tobacco, smokeless/; Smoking cessation/; Smoking/; Tobacco/; Tobacco; cigar*; "hand-roll"; handroll*; "hand-rolls"; "hand-rolled"; bidi; bidis; beedi; beedis; rolie; rolies; paan; gutkha; snuff; betel; cigar; cigars

(3) Smoking cessation

quit*; abstain*; abstinence; reduction; restrict*; reduce; cessation; (smoking; smoker#; tobacco; cigarette; cigarettes N2 quit; quitting; quitted; abstain; abstinence; reduction; reduces; reduce; abstaining); (tobacco; smoking; ADJ control); smoking services; smoking service; anti smoking; anti tobacco; temporary abstinence; (quit, abstain, abstinence, reduction, reduce, abstaining, ADJ2 tobacco, smoking, cigarette); (smoking, tobacco, cigarette#, smoker# N2 prevent; prevention; preventing; prevents; restrict#; restrict; restriction; restricted; restricts; restricting).

(4) Collaborative working

The following terms will be used to capture relevant literature on collaborative and joined up working in acute and maternity settings:

partnership# ; "team work" ; "teamwork"; teamworking; "team working”; cooperation; (cooperative W1 behavio#r); "integration"; "integrative approach"; "integrative approaches"; collaborat*; interagenc*; multiagenc*; "inter-institutional"; "inter-

institutionally"; "inter-professional"; "inter-departmental"; "inter-departmentally"; interinstitutional*; interprofessional; interdepartmental*; "interprofessional relations"; "interprofessional relationships"; (multidisciplin*); "cross discipline"; "cross disciplinary"; (interagency); linkage#; "cross-discipline"; "cross-disciplinary".

Search strategy

The search strategy for Medline is shown in Appendix 1.

A systematic search of the grey literature will not be undertaken but hand searching of bibliographies of systematic reviews the meet the inclusion criteria will be carried out to ensure that relevant data are included in this review.

To supplement the search for evidence NICE may issue a call for evidence from registered stakeholders. Relevant evidence will be included in this review

Equality and Diversity

The search strategy will be inclusive and aims to capture a broad range of evidence across all ethnic and disadvantaged groups.

Electronic resources

Databases

The following list includes the electronic databases that will be searched

- AMED (Allied and Complementary Medicine)
- ASSIA (Applied Social Science Index and Abstracts)
- British Nursing Index
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- Cochrane Central Register of Controlled Trials
- Cochrane Database of Systematic Reviews
- Database of Abstracts of Reviews of Effectiveness (DARE; 'other reviews' and Health Technology Assesment (HTA) database in CRD database)
- Current Contents
- EMBASE
- EPPI Centre TRoPHI
- HMIC (or King's Fund catalogue and DH data)
- Medline
- UK Clinical Research Network Portfolio Database
- PsycINFO
- Sociological Abstracts
- Social Policy and Practice

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- Web of Knowledge (Science and Social Science Citation Indexes)
- CDC Smoking & Health Resource Library database
- Specialist (public health) systematic review registers
    - EPPI Centre DoPHER
    - Health Evidence ca

Websites

A minimum of 10 Internet sites will be searched from the following:

- Smoke free http://smokefree.nhs.uk
- NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/,
- Action on Smoking and Health (ASH) http://www.ash.org.uk
- Treat tobacco.net http://www.treatobacco.net/en/index.php
- Society for Research on Nicotine and Tobacco http://www.srnt.org
- International Union against Cancer http://www.uicc.org
- WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en
- International Tobacco Control Policy Evaluation Project http://www.itcproject.org
- Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm
- Current controlled trials www.controlled-trials.com
- Association for the treatment of tobacco use and dependence (ATTUD) www.attud.org
- National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html
- NICE
- Public health observatories
- Scottish Government
- Welsh Assembly Government
- NHS Evidence
- Joseph Rowntree Foundation
- The Centre for Tobacco Control Research (University of Stirling)
- UK Centre for Tobacco Control Studies
- Tobacco Control Research Group (University of Bath)
- http://www.controlled–trials.com

Restrictions

The following inclusion and exclusion criteria will be applied to the searches.

Inclusion Criteria

The following will be included:

Review 2:

- Systematic reviews

Review 3: Barriers & facilitators for smoking cessation interventions in acute & maternity services

- Controlled studies published from 1990 to the most recent available at the time of the search

Review 3:

- All relevant experimental, observational and qualitative studies
- Descriptive reports

Exclusion Criteria

The following will be excluded:

- Animal studies
- Studies that do not primarily address the review questions; and
- Studies not published in English

Gathering the evidence.

The search strategy will be translated for use, and then run on each of the various databases and websites.

Documenting the search process

At the completing of searching each database the following steps will be undertaken:

1. Results from the database searches will be downloaded into 'Endnote'. Items which cannot be downloaded into bibliographic software will be recorded in a Word document
2. A word document containing the search strategies for each resource searched will be created. Each strategy will include audit information, as shown in appendix 2.
3. A final de-duplicated 'Reference manager database'.

Reference details for any studies which may be of relevance to the contractors who will be undertaking, component 2 (Mental Health reviews), component 3 (smokefree reviews) component 4 (Cost effectiveness review and economic analysis) or component 5 (nicotine review) will be recorded in EndNote and provided to the NICE Team to pass these files onto the relevant contractors.

Reviewing the evidence

Reviewing of the scientific evidence will involve the following five steps:

1) Select the relevant evidence.

2) Assess its quality.
3) Extract, synthesise and present it.
4) Derive evidence statements.
5) Assess its applicability.

Studies will be selected on the basis of relevance to the scope of this review and consideration will given to:

- Relevance to the PICO table described above
- The hierarchy of evidence
- Availability of evidence – if high quality evidence is not available then we will use the best available evidence.

Selecting the relevant evidence

Title/ abstract screening

All titles and abstracts obtained from the search will be independently screened by members of our Project Team; using a screening checklist (a sample screening checklist is outlined in Appendix 3). Where there is disagreement the full paper will be obtained and resolved by discussion. .

The following studies will be considered:

- Quantitative studies (both experimental and observational studies);
- Qualitative studies;
- Systematic reviews; and
- Information that addresses the review questions.

Full-paper screening

Full papers will be obtained for those abstracts that meet the criteria for inclusion and will be independently screened for inclusion by members of the project team. Any disagreement will be resolved via discussion. The composite inter-rater reliability scores will be reported and the selection process will be summarised in a flow diagram. Each study excluded at the full-paper screening stage will be listed in the appendix of the review, along with the reason for its exclusion.

Assessment of study quality

The internal and external validity of studies will be assessed using quality appraisal checklists provided in appendix 4.

Each paper will be graded using the rating scale summarised below. Quality of this process will be assessed by appraising 10% of papers by a second appraiser to check accuracy. Any disagreement will be resolved by a third appraiser. The composite inter-rater reliability scores will be reported. This approach was utilised in previous NICE systematic reviews completed by members of this review team.(McRobbie, Hajek, Bullen, & Feigen, 2006; Myers, West, & Hajek, 2009)

Internal validity

The review team will use the checklists to ascertain if potential sources of bias have been minimised and to determine if its conclusions are open to any degree of doubt. Each study should be rated ('++', '+' or '-') to indicate its quality, where:

- ++ All or most of the checklist criteria have been fulfilled; where they have not been fulfilled the conclusions are very unlikely to alter.
- \+ Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.
- – Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

The reasons for the quality rating will be documented in the appraisal checklist.

External validity

The external validity of studies will be assessed by determining the extent to which the findings for the study population are generalisable to the whole 'source population'. A rating of EV++, EV+, or EV- will be applied to indicate the degree of quality.

Data extraction and synthesis

Data extraction

A narrative summary and evidence table will be completed for each selected study. Data will be extracted into the evidence tables and will document data regarding the:

population; intervention (e.g. use of nicotine replacement products); and outcomes. The template that will be used for the evidence table is shown in Appendix 6, and is based on the recommendations of the NICE CPHE Methods Manual.[16] For quantitative studies exact p-values (whether or not significant) and confidence Intervals, where available, will be reported. Separate evidence tables will be produced to summarise the evidence related to each review question.

For qualitative data, analysis of the themes will be presented in the evidence tables along with a brief narrative of the paper – See Appendix 7.

Data synthesis

Findings from the review will be grouped into sections that will answer each review question. Subsections will be created to summarise data related to particular sub-topics. Evidence statements will be provided for each subsection.

Where data allows, meta-analyses will be undertaken.

Qualitative data will be themed and summarised. The main topics are likely to concern setting up systems for identification and referral of pregnant smokers, setting up systems for treatment in both pregnancy and secondary care, and issues concerning follow-up/post discharge care.

Meta-analyses

Meta-analyses will be conducted using RevMan software. A fixed effect model will be used, except in situations where there is statistical heterogeneity where a random effects model will be used. Forest plots will be presented for all meta-analyses.

Narrative summaries

The key findings of evidence will be summarised in concise narrative summaries that relate to particular sub-topics.

Evidence statments

The proposed evidence statements to be used in this evidence review will follow NICE recommendations. Statements will contain a descriptor, strength, and direction (positive or negative) of the evidence. Quality ratings of studies will be

used to formulate the strength. The overall strength will be summarised using the following:

- No evidence
- Weak evidence
- Moderate evidence
- Strong evidence

Evidence statements will also be developed from qualitative data. These will summarise the quality, context and key findings, and state the degree of concurrence between studies.

Applicability statements

The degree of applicability of the evidence, summarised in each evidence statement in this review, to the UK setting will be assessed. For each study included the reviewers will assess characteristics of the population, setting, intervention and outcomes studied. An applicability statement, showing the applicability of the evidence to the UK setting will be formulated and presented after each evidence statement using the following terms:

- directly applicable
- partially applicable
- not applicable.

Issues related to Inequalities

Any issues related to inequalities that appear in the literature will be flagged and summarised in a separate section of the final report.

References

Hughes, J. R. (2007). Effects of abstinence from tobacco: valid symptoms and time course. *Nicotine Tob Res, 9*(3), 315-327.

Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., & Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy. *Cochrane Database Syst Rev*(3), CD001055.

McRobbie, H., Hajek, P., Bullen, C., & Feigen, V. (2006). Rapid review of non-NHS treatments for smoking cessation Retrieved 6 Oct 2011

http://www.nice.org.uk/nicemedia/pdf/SmokingCessationNon-NHSFullReview.pdf

Moller, A., & Villebro, N. (2009). Interventions for preoperative smoking cessation. *Cochrane Database Syst Rev*(3).

Myers, K., West, O., & Hajek, P. (2009). A rapid review of interventions to prevent relapse in pregnant ex-smokers: A report to the National Institute for Health and Clinical Excellence. London.

Pollak, I., & Mullen, P. D. (1997). An exploration of the effects of partner smoking, type of social support, and stress on postpartum smoking in married women who stopped smoking during pregnancy. *Psychology of Addictive Behaviors, 11*(3), 182-189.

Walsh, R., & Redman, S. (1993). Smoking cessation in pregnancy: Do effective programmes exist? *Health Promotion International, 8*(2), 111-127.

West, R., & Shiffman, S. (2001). Effect of oral nicotine dosing forms on cigarette withdrawal symptoms and craving: a systematic review. *Psychopharmacology (Berl), 155*(2), 115-122.

Review 3: Barriers & facilitators for smoking cessation interventions in acute & maternity services

Search strategy for Medline

Smoking cessation in acute and maternity services: one review of effectiveness and one review of barriers and facilitators

Platform: EBSCO

Search conducted by C. Stansfield on 4 January 2011

Results: 6634

#	Query	Results
S1	MH ("TOBACCO USE CESSATION+")	18854
S2	(MH "Smoking Cessation")	16197
S3	(MH "Smoking/PC")	13139
S4	TI ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)	1331
S5	AB ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)	2629
S6	TI (quit* OR abstain* OR abstinence OR reduction OR restrict* OR reduce OR cessation)	119903
S7	AB (quit* OR abstain* OR abstinence OR reduction OR restrict* OR reduce OR cessation)	1167034
S8	TI ((stop N2 smoking) OR (stopping N2 smoking) OR (stopped N2 smoking) OR (stoppage N2 smoking))	526
S9	TI ((stop N2 cigarette) OR (stopping N2 cigarette) OR (stopped N2 cigarette) OR (stoppage N2 cigarette))	6
S10	AB ((stop N2 cigarette) OR (stopping N2 cigarette) OR (stopped N2 cigarette) OR (stoppage N2 cigarette))	63
S11	TI ((stop N2 cigarettes) OR (stopping N2 cigarettes) OR (stopped N2 cigarettes) OR (stoppage N2 cigarettes))	4
S12	AB ((stop N2 cigarettes) OR (stopping N2 cigarettes) OR (stopped N2 cigarettes) OR (stoppage N2 cigarettes))	39
S13	AB ((stop N2 tobacco) OR (stopping N2 tobacco) OR (stopped N2 tobacco)	106

	OR (stoppage N2 tobacco))	
S14	TI ((stop N2 tobacco) OR (stopping N2 tobacco) OR (stopped N2 tobacco) OR (stoppage N2 tobacco))	28
S15	TI ((smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))	531
S16	AB ((smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))	1348
S17	AB ((smoking N2 prevent) OR (smoking N2 prevention) OR (smoking N2 preventing) OR (smoking N2 prevents) OR (tobacco N2 prevent) OR (tobacco N2 prevention) OR (tobacco N2 preventing) OR (tobacco N2 prevents) OR (cigarette# N2 prevent) OR (cigarette# N2 prevention) OR (cigarette# N2 preventing) OR (cigarette# N2 prevents) OR (smoker# N2 restrict#) OR (smoker# N2 restriction) OR (smoker# N2 restricted) OR (cigarette# N2 restrict) OR (cigarette# N2 restricted) OR (cigarette# N2 restricts) OR (cigarette# N2 restricting) OR (cigarette# N2 restriction) OR (tobacco N2 restrict) OR (tobacco N2 restricted) OR (tobacco N2 restricts) OR (tobacco N2 restricting) OR (tobacco N2 restriction) OR (smoking N2 restrict) OR (smoking N2 restricted) OR (smoking N2 restricts) OR (smoking N2 restricting) OR (smoking N2 restriction)) OR TI ((smoking N2 prevent) OR (smoking N2 prevention) OR (smoking N2 preventing) OR (smoking N2 prevents) OR (tobacco N2 prevent) OR (tobacco N2 prevention) OR (tobacco N2 preventing) OR (tobacco N2 prevents) OR (cigarette# N2 prevent) OR (cigarette# N2 prevention) OR (cigarette# N2 preventing) OR (cigarette# N2 prevents) OR (smoker# N2 restrict#) OR (smoker# N2 restriction) OR (smoker# N2 restricted) OR (cigarette# N2 restrict) OR (cigarette# N2 restricted) OR (cigarette# N2 restricts) OR (cigarette# N2 restricting) OR (cigarette# N2 restriction) OR (tobacco N2 restrict) OR (tobacco N2 restricted) OR (tobacco N2 restricts) OR (tobacco N2 restricting) OR (tobacco N2 restriction) OR (smoking N2 restrict) OR (smoking N2 restricted) OR (smoking N2 restricts) OR (smoking N2 restricting) OR (smoking N2 restriction))	3480
S18	AB (temporary abstinence) OR TI (temporary abstinence)	34
S19	TI ((tobacco N2 quit) OR (tobacco N2 quitting) OR (tobacco N2 quitted) OR (tobacco N2 abstain) OR (tobacco N2 abstinence) OR (tobacco N2 reduction) OR (tobacco N2 reduces) OR (tobacco N2 reduce) OR (tobacco N2 abstaining))	269
S20	AB ((tobacco N2 quit) OR (tobacco N2 quitting) OR (tobacco N2 quitted) OR (tobacco N2 abstain) OR (tobacco N2 abstinence) OR (tobacco N2 reduction) OR (tobacco N2 reduces) OR (tobacco N2 reduce) OR (tobacco N2	1157

	abstaining))	
S21	TI ((smoking N2 quit) OR (smoking N2 quitting) OR (smoking N2 quitted) OR (smoking N2 abstain) OR (smoking N2 abstinence) OR (smoking N2 reduction) OR (smoking N2 reduces) OR (smoking N2 reduce) OR (smoking N2 abstaining))	1154
S22	AB ((smoking N2 quit) OR (smoking N2 quitting) OR (smoking N2 quitted) OR (smoking N2 abstain) OR (smoking N2 abstinence) OR (smoking N2 reduction) OR (smoking N2 reduces) OR (smoking N2 reduce) OR (smoking N2 abstaining))	6788
S23	TI ((cigarette N2 quit) OR (cigarette N2 quitting) OR (cigarette N2 quitted) OR (cigarette N2 abstain) OR (cigarette N2 abstinence) OR (cigarette N2 reduction) OR (cigarette N2 reduces) OR (cigarette N2 reduce) OR (cigarette N2 abstaining))	154
S24	AB ((cigarette N2 quit) OR (cigarette N2 quitting) OR (cigarette N2 quitted) OR (cigarette N2 abstain) OR (cigarette N2 abstinence) OR (cigarette N2 reduction) OR (cigarette N2 reduces) OR (cigarette N2 reduce) OR (cigarette N2 abstaining))	586
S25	TI ((cigarettes N2 quit) OR (cigarettes N2 quitting) OR (cigarettes N2 quitted) OR (cigarettes N2 abstain) OR (cigarettes N2 abstinence) OR (cigarettes N2 reduction) OR (cigarettes N2 reduces) OR (cigarettes N2 reduce) OR (cigarettes N2 abstaining))	30
S26	AB ((cigarettes N2 quit) OR (cigarettes N2 quitting) OR (cigarettes N2 quitted) OR (cigarettes N2 abstain) OR (cigarettes N2 abstinence) OR (cigarettes N2 reduction) OR (cigarettes N2 reduces) OR (cigarettes N2 reduce) OR (cigarettes N2 abstaining))	282
S27	TI ((smoking N2 cessation) OR (tobacco N2 cessation) OR (cigarettes N2 cessation) OR (cigarette N2 cessation))	6240
S28	AB ((smoking N2 cessation) OR (tobacco N2 cessation) OR (cigarettes N2 cessation) OR (cigarette N2 cessation))	12419
S29	TI ((smoker# N2 quit) OR (smoker# N2 quitting) OR (smoker# N2 quitted) OR (smoker# N2 abstain) OR (smoker# N2 abstaining) OR (smoker# N2 abstinence) OR (smoker# N2 reduction) OR (smoker# N2 reduce#) OR (smoker# N2 abstaining))	231
S30	AB ((smoker# N2 quit) OR (smoker# N2 quitting) OR (smoker# N2 quitted) OR (smoker# N2 abstain) OR (smoker# N2 abstaining) OR (smoker# N2 abstinence) OR (smoker# N2 reduction) OR (smoker# N2 reduce#) OR (smoker# N2 abstaining))	2118
S31	(S4 OR S5) AND (S6 OR S7)	530

S32	S1 or S2 or S3 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29 or S30 or S31	36889
S33	(MH "Patient Admission")	16145
S34	(MH "Hospitalization+")	133618
S35	(MH "Outpatients")	6928
S36	(MH "Inpatients")	10026
S37	(MH "Child, Hospitalized")	5455
S38	(MH "Adolescent, Hospitalized")	376
S39	(MH "Pregnant Women")	4529
S40	(MH "Patients")	14318
S41	TI (patient#)	1076780
S42	TI ((pregnant N3 teens) OR (pregnant N3 teenage#) OR (pregnant N3 teenager#) OR (pregnant N3 adolescent#) OR (pregnant N3 women) OR (pregnant N3 mothers))	13792
S43	AB ((pregnant N3 teens) OR (pregnant N3 teenage#) OR (pregnant N3 teenager#) OR (pregnant N3 adolescent#) OR (pregnant N3 women) OR (pregnant N3 mothers))	45618
S44	TI (inpatient# OR outpatient# OR "out patient" OR "out patients" OR "inhospital" OR (day N2 patient#) OR "ill patients" OR "acutely ill" OR primip* OR primigravid*)	40738
S45	AB (inpatient# OR outpatient# OR "out patient" OR "out patients" OR "inhospital" OR (day N2 patient#) OR "ill patients" OR "acutely ill" OR primip* OR primigravid*)	169326
S46	TI ((patient# N2 surgery) OR (patient# N2 operation) OR (patient# N2 discharge#) OR (patient# N2 readmission#) OR (patient# N2 postdischarge#) OR (patient# N2 emergency) OR (patient# N2 emergencies))	14963
S47	AB ((patient# N2 surgery) OR (patient# N2 operation) OR (patient# N2 discharge#) OR (patient# N2 readmission#) OR (patient# N2 postdischarge#) OR (patient# N2 emergency) OR (patient# N2 emergencies))	119288
S48	TI ((patient# N2 referral#) OR (patient# N2 referring) OR (patient# N2 admittance#) OR (patient# N2 admitting) OR (patient# N2 admission#) OR (patient# N2 readmittance) OR (patient# N2 readmitting) OR (patient# N2 readmission#) OR (patient# N2 postoperable) OR (patient# N2 postoperative) OR (patient# N2 refer) OR (patient# N2 refers) OR (patient# N2 admit) OR (patient# N2 admits))	4715

S49	AB ((patient# N2 referral#) OR (patient# N2 referring) OR (patient# N2 admittance#) OR (patient# N2 admitting) OR (patient# N2 admission#) OR (patient# N2 readmittance) OR (patient# N2 readmitting) OR (patient# N2 readmission#) OR (patient# N2 postoperable) OR (patient# N2 postoperative) OR (patient# N2 refer) OR (patient# N2 refers) OR (patient# N2 admit) OR (patient# N2 admits))	46690
S50	TI (maternity OR "maternal health" OR obstetrics OR "prenatal care" OR "prenatal services" OR "antenatal care" OR "antenatal services" OR "obstetric care" OR "obstetric services" OR "perinatal care" OR "prenatal clinic" OR "prenatal clinics" OR "prenatal health" OR "prenatal service" OR "antenatal clinic" OR "antenatal clinics" OR "antenatal service" OR "antenatal health" OR "obstetric clinic" OR "obstetric clinics" OR "obstetric service" OR "obstetric health" OR "perinatal clinic" OR "perinatal clinics" OR "perinatal service" OR "perinatal services" OR "perinatal health" OR pregnancy OR "maternity healthcare" OR "obstetric healthcare" OR "prenatal healthcare" OR "antenatal healthcare" OR "perinatal healthcare" OR "maternal care" OR "maternal service" OR "maternal services" OR hospitalised OR hospitalized OR "secondary care" OR "acute care" OR "secondary health service" OR "secondary health services" OR "acute health service" OR "acute health services" OR "acute setting" OR "acute settings" OR "acute service" OR "acute services")	157954
S51	AB (maternity OR "maternal health" OR obstetrics OR "prenatal care" OR "prenatal services" OR "antenatal care" OR "antenatal services" OR "obstetric care" OR "obstetric services" OR "perinatal care" OR "prenatal clinic" OR "prenatal clinics" OR "prenatal health" OR "prenatal service" OR "antenatal clinic" OR "antenatal clinics" OR "antenatal service" OR "antenatel health" OR "obstetric clinic" OR "obstetric clinics" OR "obstetric service" OR "obstetric health" OR "perinatal clinic" OR "perinatal clinics" OR "perinatal service" OR "perinatal services" OR "perinatal health" OR pregnancy OR "maternity healthcare" OR "obstetric healthcare" OR "prenatal healthcare" OR "antenatal healthcare" OR "perinatal healthcare" OR "maternal care" OR "maternal service" OR "maternal services" OR hospitalised OR hospitalized OR "secondary care" OR "acute care" OR "secondary health service" OR "secondary health services" OR "acute health service" OR "acute health services" OR "acute setting" OR "acute settings" OR "acute service" OR "acute services")	255290
S52	TI ((acute W2 ward) OR (acute W2 wards) OR (general W2 ward) OR (general W2 wards) OR (stay W2 ward) OR (staying W2 ward) OR (stay W2 wards) OR (staying W2 wards))	677
S53	AB ((acute W2 ward) OR (acute W2 wards) OR (general W2 ward) OR	2962

	(general W2 wards) OR (stay W2 ward) OR (staying W2 ward) OR (stay W2 wards) OR (staying W2 wards))	
S54	TI ((accident W3 unit) OR (accident W3 department) OR (emergency W1 unit) OR (emergency W1 department) OR (surgical W1 ward) OR (patient# N2 surgery) OR (surgery W2 unit) OR (surgery W2 department) OR (acute W2 unit) OR (acute W2 department))	23092
S55	AB ((accident W3 unit) OR (accident W3 department) OR (emergency W1 unit) OR (emergency W1 department) OR (patient# N2 surgery) OR (surgical W1 ward#) OR (surgery W2 unit) OR (surgery W2 department) OR (acute W2 unit) OR (acute W2 department))	108278
S56	TI (hospitals OR hospital OR (patient# N2 "post discharge"))	181415
S57	AB (hospitals OR hospital OR (patient# N2 "post discharge"))	493665
S58	(MH "Maternal Health Services+")	28351
S59	(MH "Obstetrics and Gynecology Department, Hospital")	2214
S60	(MH "Obstetrics")	14150
S61	(MH "Hospitals+")	180568
S62	(MH "Hospital Units+")	66597
S63	(MH "Outpatient Clinics, Hospital+")	14543
S64	(MH "Emergency Service, Hospital+")	40071
S65	(MH "Emergency Medical Services")	27584
S66	TI (("hospital staff") OR ("hospital personnel") OR (hospital W1 worker#) OR surgeon# OR gyne#cologist# OR obstetrician# OR midwiv* OR midwife)	25287
S67	AB (("hospital staff") OR ("hospital personnel") OR (hospital W1 worker#) OR surgeon# OR gyne#cologist# OR obstetrician# OR midwiv* OR midwife)	103541
S68	TI (hospital) OR AB (hospital)	533136
S69	TI (doctor# OR nurse# OR physician# OR clinician# OR pharmacist# OR health W1 worker# OR consultant# OR (medical W1 specialist#) OR (medical W1 officer#))	191646
S70	AB (doctor# OR nurse# OR physician# OR clinician# OR pharmacist# OR health W1 worker# OR consultant# OR (medical W1 specialist#) OR (medical W1 officer#))	412247
S71	S69 or S70	543647
S72	(S68 and S71)	67181
S73	AB (partnership# or "team work" or "teamwork" OR teamworking OR "team	261508

	working" or cooperation or (cooperative W1 behavio#r) or "integration" or "integrative approach" OR "integrative approaches" or collaborat* or interagenc* or multiagenc* or "inter-institutional" or "inter-institutionally" or "inter-professional" or "inter-departmental" or "inter-departmentally" or interinstitutional* or interprofessional or interdepartmental* or "interprofessional relations" or "interprofessional relationships" or (multidisciplin*) or "cross discipline" OR "cross disciplinary" or (interagency) OR linkage# OR "cross-discipline" OR "cross-disciplinary")	
S74	TI (partnership# or "team work" or "teamwork" OR teamworking OR "team working" or cooperation or (cooperative W1 behavio#r) or "integration" or "integrative approach" OR "integrative approaches" or collaborat* or interagenc* or multiagenc* or "inter-institutional" or "inter-institutionally" or "inter-professional" or "inter-departmental" or "inter-departmentally" or interinstitutional* or interprofessional or interdepartmental* or "interprofessional relations" or "interprofessional relationships" or (multidisciplin*) or "cross discipline" OR "cross disciplinary" or (interagency) OR linkage# OR "cross-discipline" OR "cross-disciplinary")	71666
S75	(S33 or S34 or S35 or S36 or S37 or S38 or S39 or S40 or S41 or S42 or S43 or S44 or S45 or S46 or S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 or S54 or S55 or S56 or S57 or S58 or S59 or S60 or S61 or S62 or S63 or S64 or S65 or S66 or S67 or S68 or S72 or S73 or S74)	2614599
S76	S75 AND S32	7304
S77	MH ("Humans") AND MH ("Animals")	1253188
S78	MH ("Animals")	4777882
S79	S78 NOT S77	3524694
S80	S76 NOT S79	6634

Notes:

= wildcard of 1 or 0 characters

* = truncation

N2 = words within 2 places of each other in any order

W2 = words within 2 places of each other in the order written in the text

Appendix 2 – Summary of Studies Included in Chapter 1

The table below summarises the studies included in Chapter 1.

Author	Summary
Adriaanse 1991, Spain Study (Service audit)	A 200 bed hospital implemented a smoke-free policy, prevalence of staff smoking declined from 51% to 40% (S-2)
Adsit 2005, USA Study (Service audit)	Wisconsin training programme trained over 10,000 HCPs in 4 years. Over this time Health Plans covering smoking cessation medications increased from 56% in 2002 to 74 in 2004 and those covering behavioural intervention from 58% to 76% (S-1)
Al-alawy 2011, UK Study (Service audit)	269 hospital staff from Rotherham trained in smoking cessation brief intervention Rotherham, Over 13 months 890 smokers referred to treatment; 414 set TQD; 143 4-week quitters. Of 50 hospital smokers, 28 advised and 11 referred. UK experience, and implementation details (S-3)
Aziz 2009, UK Study (Meta-Analysis)	Meta-analysis of 11 studies, concluded that a combination of extended follow-up and medications is effective in smoking cessation (S-3)
Ballbe 2008, Spain Study (Pre-post)	66 HCP trained in brief intervention, training improved their skills, but not their practice. 170 patients pre-training and 170 post-training received similar care (Only abstract is in English) (S-2)
Batlle 1991 Spain Study (Survey)	Hospital wide programme to (1) to reduce tobacco consumption among hospital staff and (2) to create an awareness of their exemplary role as health professionals. In order to achieve these aims, different activities were carried out: lectures on the consequences of smoking; restrictions on smoking in hospital areas; and smoking cessation help for those who wished to give up smoking. Survey taken in 1986 (N=298) and 1989 (N=304). A change in attitudes among the health professionals was seen, especially with regard to their disposition to give advice to stop smoking. The results show a reduction of the prevalence of smoking among the hospital staff and a positive change in their attitudes towards smoking (S-1).

Barrera 2005, USA Study (Prospective)	Prospective study looking at post-operative pulmonary complication in patients undergoing thoracotomy for lung tumours. Not validated. Recent quitters defined as smoke free 1-2 weeks pre surgery. No significant difference in complications between the two groups (S-3)
Becker 1989 Study (Survey)	Smoke-free (S-1)
Bialous 2004, USA Study (Qualitative)	8 focus groups with current smoker or ex-smoker nurses. Current smokers feel guilty and want treatment (S-1)
Bickerstaffe 2008, UK Study (service audit)	A service audit of hospital based smoking cessation services (including pre-operative assessment). Aim of programme to identify smokers in secondary care and to provide a continuation of support post-discharge. Patient management system used, chart listing NRT details for level 2 staff, departmental agreement to receive brief training. Positive feedback from patients (S-3)
Bitton 2009 Discussion (Commentary)	Commentary on Smith et al. (2009). RCT - counselling should be extended post-discharge via quitlines (D-1)
Blake 2011, UK Study (Survey)	Smoking prevalence in pre-registration UK nurses is similar to their registered counterparts. (S-2)
Boyle 2011, USA Discussion	Protocol for Cochrane review to assess electronic medical records-facilitated interventions – EMRs prompts to AAAA (D-1)
Bryant 2008, USA Study (Pre-post)	49 nurses received smoking cessation training. Post-training more felt they knew how to assess patients, document smoking, and 'knew the strategies' (S-1)
Carson 2012 (previously Lancaster 2000), UK Discussion	17 RCTs that focussed on training HCPs in smoking cessation (in range of activities training that included single session counselling, follow-up, NRT, self-help). Training intensity ranged from 40 minutes to 4-5 days. Only two studies included hospital physicians. Training had a significant effect on smoking

(Systematic review)	cessation and professional practice. (D-3)
Chan 2006 Study (Retrospective)	Retrospective study looking at post-operative wound complications in patients undergoing bilateral breast reduction. Not validated. Recent quitters defined as smoke free less than 4 weeks before surgery. No significant difference in complications between the two groups (S-3)
Chan 2011, Malaysia Study (Survey)	Questionnaire administered to 267 paediatric ward nurses, 2% smoke, 66% do not document parent's smoking status, ½ not aware of any smokers clinics, training needed (S-1)
Chang 1995. USA Study (Pre-post)	Pulmonary physicians, chart reminders (bright stickers) improved recording of smoking stats from 33% to 83%, counselling 6-12%. Once identified, smokers almost always advised (S-3)
Cohen 1989, USA Study (RCT)	Physicians and their panel of patients were randomised to either training (advice, QD, FU check), Training and prompt (chart reminder), training and provision of NRT to patient or training, prompt and NRT. Training lasted 1 hour. PP at 12 months and CO validated. Prompted doctors were more likely to advise to quit (66% vs. 27%) and ask to set a QD (14% vs. 3%). 12 month quit rates were significantly higher for the prompted groups (7.9% vs. 1.5%) (S-3)
Cornuz 2002, Switzerland Study (RCT)	RCT looking at the efficacy of training residents in smoking cessation counselling (2.5 days training) on change in practice and abstinence rates. 1 year PP significantly increased in the intervention group (13% vs. 5%) (S-3)
Foland 2000, USA Discussion	MULTIFIT cardiac rehab program that included a component on smoking: physician advice, nurse counselling session, and telephone FU. 50%-60% quitters at 1 year (Seems similar to no-treatment rates) (D-2)
Freund 2009a, Australia Study (RCT)	Four hospitals quasi-randomised. The intervention group (broad strategy involving: linking to existing practice; training; prompts and reminders; monitoring; management support): was more likely to prescribe NRT (16% vs. 4%), give out self-help booklets (11% vs. 2%), record of session (13 vs. 3). More patients than staff reported interventions (S-3)

Freund, 2009b, Australia Study (Meta-analysis)	Meta analysis of effectiveness of interventions to increase smoking cessation care provision in hospitals. Included 25 studies but many lacked control arm and most included a multi-pronged approach. There was a 17% increase in the proportion of patients that were assisted to quit in the intervention vs. control groups (pooled risk difference = 16.6 95% CI: 4.9-28.3). There was no significant effect on assessment of smoking status, advice to quit or offer of NRT (S-3)
Garret-Symanski 2005, USA Study (Service audit)	421 smokers were seen by an inpatient smoking cessation counsellor, 129 contacted 1-6M later, 68 abstinent. (conference abstract) (S-1)
Garrett-Szymanski 2006, USA Study (Service audit)	Nurse-managers compiled daily roster –identified only ¼ of smokers (compared to room-by-room assessment by nursing students). A smoking query as mandatory field on hospitals electronic admission screen, got 90%. (S-3)
Geller 2011, USA Study (Survey)	888 paediatric nurses surveyed. 43% asked about household smokers, 25% advised to quit, 6% assisted with quit plan. 3% arranged FU. Asked if hospital admission assessment included it (S-2)
Glassman 2000, USA Study (Retrospective)	Retrospective study looking at post-operative wound complications in patients undergoing posterior instrumental infusion. Not validated. Recent quitters defined as smoke free up to 1 month before surgery. No significant difference in complications between the two groups (S-3)
Goldstein 1999, USA Discussion (Commentary)	Comment on Rigotti et al. 1999, NRT in hospitals underused, barriers: absence on inpatient formulary, lack of chart reminders, staff training (D-2)
Gomm 2002, Australia Study (Survey)	127 nurses completed a questionnaire. Most not confident about assisting patients to quit, though ⅔ thought it within their role (S-2)
Good 2004, USA	Nurses working in primary care were mailed a questionnaire. 51% reported documenting patients tobacco use, 35% provided

Study (Survey)	brief advice and 23% recommended NRT. Barriers were disinterested patients, little time, skills and knowledge. Nurses with advance nursing qualifications were more likely to feel confident about their smoking compared to those with less education (S-3)
Gosselin 2011, USA Study (RCT)	Quazi-experimental; 1 hour staff training on smoking cessation counselling and pharmacotherapy given, 112 patients contacted at 1M. Results found more patients of trained nurses reported asked, advised, prescribed, and FU. No effect on quit attempts or quit rates (S-2)
Groth 2009, USA Study (Retrospective)	Retrospective study looking at all post-operative complications in patients undergoing pulmonary resection. Not validated. Recent quitters defined as smoke free up to 1 month before surgery. No significant difference in complications between the groups (S-3)
Haile 2002, Australia Study (Pilot)	Examined the effect of a computerised screening and counselling tool in 234 patients attending a surgical preadmission clinic. Tool detected 56 smokers who went on to complete the interactive tailored (based on stage of change) cessation component. 37 could be contacted at 9 months and 22 reported stopping smoking prior to surgery. It was low cost (AUD 10,000 to develop) and highly acceptable (S-2)
Hawkshaw 2005, Australia Study (Service audit)	Audit of NRT use. Results show that whilst 80% of records had information about smoking status, few (6.3%) had evidence that NRT was provided. Most patients who were prescribed NRT were also given a prescription for more on discharge. Cite lack of knowledge and systems as barriers (S-2)
Heath 2007, USA Study (Survey)	Pre-post (12 months apart) survey to examine the effect of a 2-day training the trainer programme to increase smoking cessation knowledge of nurse educators. Training increased the proportion of nurse educators who dedicated at least 3 hours to tobacco education in their classes (22.2% to 74.1%, $p<0.01$) (S-2)
Hill 2008, UK Study (Pre-post)	Pre-post intervention (intensive training on smoking cessation delivered to nurses on respiratory, cardiology, and endocrinology wards). Training improved screening and provision of advice (pre: 31% and post: 88% of smokers received smoking cessation advice). (S-3)

Hodgson 2011, UK Study (Service audit)	Audit of 118 consecutive medical patients showed that only 1/25 current smokers' received advice. An educational programme was introduced as well as several foundation trainees were employed as smoking champions. Following this intervention documentation of smoking history increased from 0% to 68%. Prior to intervention 7 smokers on the respiratory ward were referred to treatment over a 6-month period. Post intervention this increased to 77 patients. 82% of those referred to cessation services were abstinent at 4-weeks (S-3)
Hopkinson 2011, UK Study (Service audit)	Implementation of a COPD discharge care bundle that included an offer of smoking cessation (referral). Utilised training that was provided on the ward in a 'drop in' way. Significant increase in compliance with offering smoking cessation referral (18.2% to 100%), although 11/24 smokers declined the offer. There was also a downward trend in readmission rates, although not significant and cannot be attributed only to the smoking cessation training (S-3)
Houghton 2008, USA Study (Survey)	439 (response rate 44%) certified registered nurse anaesthetists surveyed regarding their smoking cessation practice and attitudes. Most report screening for tobacco use, and think that advice to quit is important but few actually do this. Fewer offer treatment. Barriers included lacked time, lack of training (S-2)
Hurt 1995, USA Study (Pre-post)	Pre-post study that showed that having a smoking cessation intervention study that was conducted in a drug and alcohol service changed beliefs of staff members (S-1)
Hussain 1993, Wales Study (Survey)	Measured smoking prevalence and attitudes towards smoking in hospital staff. 5% of doctors and 20% of nurses smoked. 38% of respondents favoured hospital-wide smoking ban, 90% favoured ban in wards and labs.40% of smokers wanted help to stop (S-1)
Hymowitz 2005, USA Study (Survey)	Baseline survey of 1770 parents/caregivers of sick children who were taking part in a doctor training intervention study. 20% of parents reported smoking but only 10% of smokers reported that the doctor offered help to quit, and 25% reported that they were offered advice on stopping second hand smoke exposure (S-2)
Kannegaard, 2005, Denmark Study (Survey)	Report on staff smoking prevalence and attitudes. Follow-up and comparison to 1999 (unpublished study). Staff smoking prevalence decreased from 33% in 1999 to 26% in 2001. Current smokers less likely to accept cessation help. Fewer

	concerned with passive smoke (S-1)
Katz 2008, USA Study (Survey)	Cross sectional survey of tobacco, alcohol, and drug use of patients (non-ICU) from two hospitals and their willingness to change. Prevalence of smoking was 70% in patients with at-risk drug and alcohol use compared to 24% in patients who did not use these substances. Most patients want to quit drug use (S-1)
Kloss 2011, USA Study (Service audit)	Brief training programme on how to provide smoking cessation counselling and referral was provided to ED doctors. Audit of hospital records 4-month pre- and post- training showed a significant increase in proportion of smokers counselled (1.4% to 4.5%, $p<0.001$) (S-3)
Koplan 2008, USA Study (Service audit)	Assessed the impact of adding a tobacco order template to the hospital admission system. Patients coded as 'smoker' prompted a drop-down menu of smoking cessation treatment and referral options. Audit of hospital records 4-month pre- and post- implementation of the tool showed that it was used in 42% of all admissions and resulted in a small but significant increase in the proportion of patients that were referred for counselling (0.8 – 2.1%) and had NRT charted (1.6 – 2.5%), $p<0.001$ for both changes (S-3)
Kotz 2008, Netherlands Study (Survey)	Survey of Dutch Respiratory Nurses' smoking cessation practice and attitudes before and after the introduction of a smoking cessation treatment protocol. In 2006, compared with 2000, nurses offered more intensive smoking cessation counselling to patients and 7/10 behaviour change techniques were being used by >94% of nurses. Low patient motivation was the most important perceived barrier for treatment (S-2)
Kuri 2005 Japan Study (RCT)	Retrospective study looking at post-operative wound complications in patients undergoing reconstructive head and neck surgery. Not validated. Recent quitters defined as smoke free up to 6 weeks before surgery. Beneficial effect seen in those who recently quit smoking compared to continuing to smoke (S-3)
Lancaster 2000, UK Discussion (Systematic	8 RCTs that focussed on training HCPs in smoking cessation (in range of activities training that included single session counselling, follow-up, NRT, self-help). Only one study included hospital physicians. Training had no effect on smoking cessation and professional practice. (D-3)

review)	
Lindstrom 2008 Sweden Study (RCT)	RCT looking at all post-operative complications in patients undergoing hernia repair, laparoscopic cholecystectomy, hip and knee replacement. CO validated. Recent quitters defined as smoke free up to 3 weeks before surgery. No significant difference in complications between the groups (S-3)
Liu 2010, USA Study (Service audit)	US hospital with poor recording of smoking status, group formed with executive director, 1-2 hour training sessions in 5As, motivational interviewing and referrals. Barriers: time to ask, do and record, recording too many things already at admission. Each ward allocated advisor; admission nurse only records status and readiness to change, advisors do the rest. Recording of smoking status and record of intervention improved to some 90%. Effect on cessation not known (S-3)
Longo 2001, USA Study (Service audit)	Compared employees in smoke-free hospitals with groups in non-smoke-free workplaces. Bans led to quitting (though smokers may have avoided second survey or misreport) (S-2)
Malek 2007, Australia Study (Survey)	An Australian hospital's records surveyed for 100 consecutive patients, 84 had status recorded, there were some recording and coding errors (S-1)
May 2008, Australia Study (Qualitative)	Acute cardiac care, NRT not used, 13 staff members interviewed on NRT. Barriers: Cost, safety, lack of knowledge. Also not on the formulary (S-2)
McCarty 2001, USA Study (Survey)	397 nurses filled in a questionnaire. 59% thought quit advice is their obligation. Attitudes correlated with self-reported practice (S-2)
McDaniel 1999, USA Study (Service audit)	Memos displayed on wards to prompt referrals – 1/29 referred; put in charts – 18/52 referred, when prompts removed, referral dropped again. Barriers to referring: did not remember, too busy, patient not interested, patient too sick (Paper does not show what the chart reminder looked like) (S-3)
Mochizuki 1996, UK	621 students completed a questionnaire, most thought they do not have authority to advise patients on smoking (years 1-5

Study (Survey)	included). 23% Males and 16% Females smoked (S-1)
Moller 2002, USA Study (RCT)	RCT looking at all post-operative complications in patients undergoing elective hip and knee alloplasty. CO validated. Recent quitters defined as smoke free up to 8 weeks before surgery. No significant difference in complications between the two groups (S-3)
Montner 1994, USA Study (Pre-post)	34 doctors had 2h training on health effects of smoking, counselling, and relapse prevention. Training improved self-reported attitudes, beliefs, knowledge and usual practice (evaluation items not included) (S-1)
Myers 2011, UK Study (Meta-analysis)	Nine RCTs looking at post-operative complications in continued and recently quit smokers (within 8 weeks of surgery). One study found a beneficial effect of recent quitting and none identified any detrimental effect (S-3)
Naudziunas 2005, Lithuania Study (Survey)	56 CVD patients answered a questionnaire regarding advice from their doctors. Results discussed with doctors. A subsequent cohort of patients (n=64) were surveyed, doctors now more often discussed smoking, diet, BP and cholesterol (S-2)
Nicholson 2000, USA Study (Survey)	Sticker prompts were introduced on charts in 4 hospitals. 682 patients answered a questionnaire and their charts reviewed. 71% said they were counselled, only 46% charts showed it (S-2)
O'Donovan 2009, Ireland Study (Qualitative)	430 nurses, 21% smoked. Psychiatric (47%) and coronary nurses (34%) smoked more. 14% trained in smoking cessation, lack of time and training barriers to giving advice (S-2)
Olive 1996, USA Study (Survey)	2,700 staff of 2 hospitals answered a questionnaire, only one reported smoking less at work, but 8-9% quit. Smoking bans in hospital may increase staff smoking (S-1)
Palonen 2006, USA Study (Survey)	70 doctors, 659 patient surveys and 761 chart reviews. Advice to quit was 66% in records but only 52% in patient surveys (discordance both ways in different studies) (S-2)
Passera 2010, New Zealand	Cardiac nurses in a hospital advise patients using ABC approach to smoking cessation (D-1)

Discussion	
Patient Education Management 2005, USA Discussion	Nurses who smoke feel awkward, take more breaks, and are less likely to intervene with smokers. 16% of nurses in US smoke (no reference for this) (D-2)
Power 1992, UK Study (Prospective)	60 outpatients received advice and CO feedback (N=40) or usual care (N=20), this had no effect. (S-1)
Prathiba 1998, UK Study (Prospective)	663 patients received intensive treatment, 12M validated quit rate 21%. Estimated quit rate with physician advice only – 7.5%, cost per life year saved circa £400. Good investment (S-2)
Reid 2010, Canada Study (Service audit)	Implementation of 5As monitored, 6M quit rate up from 18% to 29% (S-1)
Rigotti 1999, USA Study (Prospective)	Prospective observational study within a randomized smoking-intervention trial. Inpatient pharmacy records of nicotine patch or gum use (n=650). Only 34 of 650 smokers (5.2%) received NRT during their hospital stay. NRT was more likely to be prescribed to patients with nicotine withdrawal (OR 2.23; 95% CI: 1.01, 4.90), a higher daily cigarette consumption (OR 1.04; 95% CI: 1.01, 1.06), and a longer hospitalization (OR 1.05; 95% CI: 1.00, 1.10) (S-2).
Sarna 2001, USA Study (Survey)	Survey sent to 4,000 oncology nurses (1508 responded). A subsample of 858 nurses with ‘high’ or ‘low’ barriers to delivering smoking cessation. High barriers group were more likely to be never or current smokers. They were also more likely to have less confidence and feel that they are harming their relationship with patients. Low patient motivation was the most commonly cited barrier. Others included lack of skill and knowledge (S-1)

Schofield 1995, Australia Study (Prospective)	515 doctors from two hospitals. One hospital implemented a mail out of cessation advice to patients who were recorded as smokers, the other did not. Half of all doctors were surveyed pre-implementation and the other half post-implementation. Most (71%) doctors usually advise on the risks of smoking, less (21%) give advice to quit, and less refer to cessation services (5%) or prescribe NRT (1%). Doctors in the control hospital were more likely to report never giving advice on how to quit ($p<0.05$). Physicians were significantly more likely than surgeons to encourage patients to quit ($p<0.0001$). The mail out had no effect on advice from doctors (there was a concern that it might decrease the frequency at which doctors advise patients) (S-3)
Schofield 1999, Australia Study (Service audit)	Investigated accuracy of documentation of smoking status by administration staff. Only 63% of patients with urinary cotinine indicative of current smoking were actually recorded as a smoker by admin staff. However clinical staff usually corrected this. Relying on administrative staff to assess smoking status may not be ideal (S-3)
Segaar 2007, Netherlands Study (Survey)	Survey of 206 cardiology nurses to assess application of a smoking cessation protocol. 94 nurses did not fully apply the intervention outlined in the protocol. Most nurses (80%) assessed smoking status, 70% discussed reasons to quit, and 60% discussed options for quitting. The older and more experienced nurses were more likely to implement all steps. Lack of skills was cited as a common barrier. Having a smoking room on the ward also undermined efforts (S-3)
Slater 2006, UK Study (Survey)	HCPs who smoke less likely to engage in stop-smoking advice (S-2)
Stillman 1990, USA Study (Survey)	Smoke-free (S-1)
Thompson, 2006, USA Study (RCT)	45 smokers (in CCU or general medical unit) randomised to standard education; standard education + intensive inpatient intervention; the latter with additional monthly phone calls. All were offered NRT. Barriers were: low enrolment; a need for dedicated nurses to deliver the intervention; short hospital stays

	and patients leaving wards for other interventions meant that the intervention was difficult to deliver; inconsistent NRT prescribing. (S-2)
Thy 2007, Norway Study (Survey)	784 out of 1025 hospital doctors responded to a survey on helping their patients quit smoking. Lack of time, knowledge and skills were the most commonly cited barriers. 28% said that it was not their job to do this and 32% said that it was not worth the effort (S-2)
Uzuner 2008, USA Study (Service audit)	Investigated electronic tools for coding smoking status documented in discharge summaries. Showed that discharge summaries express smoking status in a limited number of ways and therefore should be easy for electronic tools to collect these data (S-3)
Vaughn 2002, USA Study (Survey)	Explored the relationship between organisation factors and doctors adherence to smoking cessation guidelines. 94% give advice to stop, 86% explain health risks, 57% refer patients to a cessation programme, 22% give written information, 16% write a prescription for NRT. Facilitators: leadership support, educational mechanisms, monitoring and feedback, better knowledge of guidelines. Barriers: time to intervene, restriction of smoking cessation medicines (S-2)
Vega 2010, NZ Study (Service audit)	Audit of NRT prescribing in hospital pre- and post training doctors. A 45-minute training session on how to prescribe NRT changed practice (a four fold increase in units of NRT prescribed) (S-3)
Vitavasiri 2010, Thailand Study (Survey)	Survey of hospitals following decision to have 100% smokefree hospitals. Facilitators included public display of non-smoking policy, arrangement of anti-smoking related activities, cessation services (staff cessation, identification of smokers, cessation clinics, research). Barriers: low support for policy, no penalty for smokers, low awareness of risks and treatment, lack of knowledge and skills of staff (S-2)
Vokes 2006, USA Study (Qualitative)	Descriptive analysis of audiotapes from 871 doctor-patient interactions in an emergency department. All patients were women and non-emergencies. 484 (56%) were screened for smoking, 56% of the 156 smokers were given advice to quit and

	13% were referred for treatment. Screening was more likely in urban compared to suburban centres and more likely to occur if the person was presenting with a smoking related disease (S-3)
Von Garnier 2008, Switzerland Study (Survey)	314 outpatients contacted by phone with 24 hours post-appointment. Asked about advice from doctors. 81% asked about smoking, 28% received advice on risks, 10% got advice to quit, and 9% offered help to quit (S-3)
Von Garnier 2010, Switzerland Study (Survey)	Following on from 2008 study. Showed an improvement on training doctors. Doctors received half day training on smoking cessation counselling (motivational interviewing and the 5As and 5Rs approach). 272 outpatients contacted by phone with 24 hours post-appointment. 82% asked, 46% received advice on risks, 32% got advice to quit, and 23% offered help to quit (S-3)
Walker 2009, UK Study (Prospective)	25 orthopaedic patients advised to quit, then recommended to see GP for further help, pre-operatively. 16 stopped pre-surgery. 12 not smoking at 1 year. Self-report (S-1)
Walsh 2007, USA Study (Survey)	36 doctors/students, post-training felt more likely to Ask, Advise, Assist, had some improved smoking cessation knowledge (S-1)
Wang 1994, Taiwan Study (RCT)	27 physicians randomised to receive one of 3 conditions: training (2 lessons), poster reminder to give advice, or usual care. Self reported abstinence at 6 months was significantly higher in the trained group (28.6% vs 4.3%). Combination of primary physicians and internists.(Residents and physicians in family medicine – setting not reported) (S-1)
Ward 2002, USA Study (Survey)	879 ambulatory care physicians filled out Q. 62% received no training on smoking cessation guidelines; 44% unfamiliar with them. 93% always/usually suggest smoking cessation; 57% always/usually refer to specialist service (usually at hospital); 16% felt smokers greatly/very greatly receptive to advice; 30% did FU's about ½ the time (S-1)
Ward 2002 USA Study (Survey)	Evaluated the effect of the AHCPR smoking cessation guideline on provider practices with smokers and on patient smoking rates. Patient survey and chart review data from 138 Veterans Administration (VA) acute care medical centres. There was a significant increase in the percentage of patients in the VA who

	were counselled about smoking and a significant decrease in the percentage of patients who smoke. (S-2)
Ward, 2003, USA Study (Survey)	Evaluated the effect of smoking cessation guidelines on practice via patient survey and audit of charts between 1996 and 1998. Chart audit showed a significant increase in screening of tobacco use (61%-95%; p=0.0001) and counselling (p<0001). Patient survey also showed that smokers were more likely to be counselled in 1998 (79%) than in 1996 (76%), p=0.0001 (S-3)
Warner 1984, USA Study (Retrospective)	Retrospective study looking at post-operative pulmonary complications in patients undergoing coronary artery bypass grafting (CABG). Not validated. Recent quitters defined as smoke free up to 8 weeks before surgery. No significant difference in complications between the two groups (S-3)
Warner 1989, USA Study (Retrospective)	Retrospective study looking at post-operative pulmonary complications in patients undergoing coronary artery bypass grafting (CABG). Urinary cotinine validated. Recent quitters defined as smoke free up to 8 weeks before surgery. No significant difference in complications between the two groups (S-3)
Warner 2004, USA Study (Survey)	328 anaesthesiologists (ANs), 299 surgeons (SGNs) surveyed. ~90% ANs and SGNs asked smoking status. 85% ANs and 40% SGN never/rarely provide help or refer. Barriers: interventions thought ineffective, time, lack of knowledge (S-2)
Warner 2008, USA Study (Qualitative)	19 surgical patients, 10 surgeons interviewed. Patients want more input from surgeons, knew little about quitlines but willing to call them. Most surgeons knew about quitlines, knew nothing else about them, but were willing to refer. Want max 30 mins training on them (S-2)
Warner 2009, USA Study (Survey)	14 anaesthesiology practices. 97 Anaesthesiology staff were surveyed. Post training, 87% Ask patients, 56% advise, 41% refer, 23% strongly agree/agree not enough time for AAR (S-1)
Warner 2011, USA Study (RCT)	300 pre-surgery patients randomised to quitline referral or 5As. 29/149 referral group had at least one quitline call; 0/151 control. No diff in self-report continuous abstinence at 1 or 3 months. No difference in NRT use, usefulness of advice from surgery doc.

	79% of quitline contacts made post-op (S-3)
Watts 2011, NZ Study (Service audit)	Conference Abstract. CCU Nurses encouraged to do ~3As, to become 'quit nurse'. Over two years, Ask/Advise up to ~100%, assist/refer ~50%. 'Quit nurses' went from 6 to 12 (S-1)
Whyte 2006, UK Study (Qualitative)	12 nurses interviewed/patient interactions taped. Smoking discussed, rarely acted on, training needed. (S-1)
Wicentowski 2008, USA Study (Service audit)	Algorithm to identify smoking status using info from discharge chart missing smoking info was 50-90% precise (S-1)
Wilber 2011, USA Study (Service audit)	Conference abstract. 800 nurses/docs. 24% had training, 75% usually/always took smoke stat, 28% spent 3/more mins on advice. ~70% likely/very likely to give leaflet/phone number. 15% un/very unlikely to give meds/refer (S-2)
Willaing 2004, Denmark Study (Survey)	Of 1429 HCPs, 30% smoked, 26% ex-smokers. 2.4% had received smoking training. Smokers underestimate health risk, less likely to give advice. Lower self-confidence in skills=less frequent advice (stats unclear though) (S-2)
Willett 2009, USA Study (Service audit)	Staff at 43 hospitals, marketing at HCPs, and 9000 community staff trained to fax refer. Referrals/month went from 68 to 412 (1/3 from hospitals). Less than ¼ enrolled, 60% unreachable (S-2)
Williams 2005, USA Study (Service audit)	76 staff from hospitals with high rankings for smoking counselling compared to 37 staff from low ranked hospitals (113 hospitals total). High ranked hospitals were more likely to take smoking status, prescribe, refer, document things. No differences in barriers to providing counselling (S-1)
Wilson 1998, Canada Study (RCT)	83 family physicians randomised to receive either normal care, NRT and advice or NRT plus training (use of gum, 1-6 FU visits and QD). There were significant differences in sustained abstinence rates at 1 year (8.8% (I) vs 6.1% and 4.4%) between arms but not for 1 year PP (8.8% (I) vs. 6.1% vs 4.4%). Training (85%) and gum (70%) groups more likely to mention smoking

	that usual care group (31%). Training group more likely to ask for a QD and arrange FU. Training (63%) and gum group (59%) more likely to suggest using gum than usual care group (9%) (S-2)
Wolfenden 2005, Australia Study (RCT)	Pre-operative patients were randomly assigned to an experimental group (EG; n=124) or usual cessation care group (UC; n=86). The EG intervention included the use of opinion leaders, consensus processes, computer-delivered cessation care, computer-generated prompts for care provision by clinic staff, staff training, and performance feedback. EG patients were significantly more likely than UC patients to report receiving brief advice by nursing (79% vs. 47%; P < 0.01) and anaesthetic (60% vs. 39%; P < 0.01) staff. EG patients who were nicotine dependent were also more likely to be offered preoperative nicotine replacement therapy (NRT) (82% vs. 8%; P < 0.01) and be prescribed postoperative NRT (86% vs. 0%; P < 0.01). The EG intervention was found to be acceptable by staff (S-2)
Wolfenden 2007, Australia Study (Survey)	1004 surgery patients self-assessed smoking via touchscreen computer. Patients and staff found this acceptable (S-1)
Wolfenden 2008, Australia Study (Survey)	Part of larger (unpublished) study. 23 of 67 pre-op smokers in fax referral group received call from quitline. Most patients thought quitline useful. 2 of 4 nurses felt referral too time-consuming. Cost of referral US$2 (S-3)
Wolfenden 2009, Australia Discussion (Commentary)	Comment on previous studies, how they address barriers: lack of organisational support, perceived patient objection, lack of systems to identify smokers, lack of staff time and skill, perceived inability to change care practices, perceived lack of efficacy of cessation care and cost of providing care (D-1)
Xiao 2011, China Study (Service audit)	Implementing smoke-free in 41 hospitals in China, led to reduction in staff smoking, outside smoking areas helped, organisational change needed chief executives involved (S-1)
Zhang 2005, USA Study (Service audit)	38 hospitals to improve post-MI care, computerised data feedback, performance improvement teams, use of aspirin, beta-blockers etc. improved, stop-smoking advice increased from 35% to 81% (S-1)

Appendix 3 – Summary of Studies Included in Chapter 2

The table below summarises the studies included in Chapter 2.

Author	Summary
Abatemarco 2007, USA Study (Survey)	196 MWs responded to a clinical practice survey. 99% ask about smoking and advise to quit, 44% set TQD, 36% advise on meds, 24% offer FU, 38% refer, 75% check tobacco use at each visit. 11% smoke themselves, 21% had cessation training, 81% would want it. Barriers: 81% patients resistance, 78% lack of patient interest, 73% competing priorities, 73% lack of training, 63% lack of resources for referral, 49% lack of time (S-3)
Abrahamsson 2005, Sweden Study (Qualitative)	24 MWs interviewed, MW's experience described as 'avoiding', 'informing', 'friend-making', and 'co-operating'. Authors agenda is to move MWs role from expert advice to counselling mode to 'enable' and 'give the space to grow' (S-1)
Albrecht 2011, USA Study (Retrospective)	5A staff training programme, 144 smokers recruited, 78 participated (unclear), 22 'able to abstain for at least part of the evaluation period'. Of 326 smokers, 202 received cessation information, and 144 were willing to take part in the programme (S-1)
Aquilino 2003, USA Study (Qualitative)	Focus groups with 25 Women, Infants, and Children clinic staff (mix of nurses, dieticians, social workers). Relevant factors: time, priorities, approach to clients, training. Barriers: Not knowing if brief interventions work, booklets for clients, no mechanism to track outcome. Includes quotable staff quotes and details (S-2)
Bakker 2003, Netherland Study (Prospective)	118 MWs given intervention manual, card with 7 steps, videos for clients, and training or not (not randomised), about half filled in follow-up questionnaire, clients also. MWs reported they provide interventions a lot, less according to clients. (Unpublished outcome study showed short-term but no long-term effect of MW intervention on women, no effect on partners) (S-1)
Bakker 2005, Netherlands	237 MW filled in questionnaire. More active MW believe in the efficacy of their advice more (S-1)

Study (Survey)	
Battersby 2003, UK Study (Service audit)	Doncaster service employs 2 specialists (MWs) and trains all MWs to refer. 150 quit in a year - an example of good practice (S-3)
Beenstock 2012, UK Study (Survey)	Midwives sent a survey to complete on implementation difficulties of NICE recommendations to ask, refer, advise and validate pregnant smokers. Midwives were not positive about the consequences of their actions on smoking cessation. Only 19% of respondents agreed that discussion of smoking with pregnant women was not usually perceived as nagging. Midwives also reported lack of resources to provide SC (S-1)
Bishop 1998, Australia Study (Qualitative)	Staff (unclear if specifically MWs) believe that counseling is not very successful, they lack skills, and have little time. Little structural support and unclear public health messages (S-2)
Bryce 2009, UK Study (Prospective)	Development, implementation and evaluation of an intervention to help young pregnant smokers. MWs willing to refer. Of 152 eligible clients referred within the 16-month period, 79 (52%) joined CATCH. Of those who joined, 18 (22.8%) were self-reported non-smokers at 3 months, of whom 16 (20.3%) were validated as non-smokers using carbon monoxide monitoring. Thirteen (16.5%) clients reported being smoke free at 12 months, of whom 10 (12.7%) were validated as non-smokers at 12 months (S-3).
Bull 2007, UK Study (Qualitative)	Two focus groups with MWs and HVs, felt women have reasons to smoke, need to be ready to quit and have multidisciplinary team to help. Not sure what works, lack of feedback, not sure about NRT, not clear if training needed (S-1)
Cooke 1996, Australia Study (Survey)	425 MWs responded to a questionnaire. Most provided brief advice occasionally, but not more intensive counselling and setting TQD. Barriers: Lack of policies, time, and ability to counsel (S-3)
Cooke 1998, Australia	203 MWs and doctors filled in a questionnaire. Most do not do much, lack of specific procedures, materials, time, training. Pessimism about effectiveness (S-3)

Study (Survey)	
Cooke 1999, Australia Study (RCT)	23 clinics (12 and 11) randomised, simple (mail out) or intensive (personal training) dissemination of 'Fresh Start'. 7 and 9 clinics adopted the programme (S-2)
Cooke 2000, Australia Study (RCT)	Same study as above, managers listed barriers: negative client reaction; insufficient time; lack of support from colleagues; inability to provide follow-up to clients; staff turnover; poor access and storage of materials (S-2)
Groner 2005, USA Study (Service audit)	Seven home-health nurses (USA equivalent of health visitors) received 4h training, plus two sets of 2h booster session, in CBT-based relapse prevention for new mothers. Intervention delivered over four sessions (hospital, home, and phone contacts) during first two months post-partum. Of 121 mothers enrolled, 2/3 received at least one home visit; 85% recalled discussing smoking, ¾ had positive feelings about discussing smoking and only 4% had negative feelings. 43% felt the intervention was helpful. Four of the seven nurses believed patients were receptive to advice. No cessation data. (S-3)
Hartmann 2007, USA Study (Survey)	Survey of 844 (74% response rate) maternity care providers to assess the implementation of the 5As and barriers. The majority ask and advise, but less assess, assist and arrange. Most (71%) reported lack of time as a barrier, lack of patient interest (68%) and limited effectiveness (39%). Having a counseling resource was associated with better implementation of the 5As (S-2)
Hassel 2007, Germany Discussion (Systematic review)	A review on MI training – no useable information.
Herberts 2012, UK Study (Qualitative)	Three focus groups of 15 MWs from 2 acute NHS trusts in London, and 10 semi structured interviews with pregnant smokers. MWs report barriers that include: time, relationship with patient, and see smoking as the least of women's worries. Pregnant women perceive a feeling of 'hardship' (it's not fair to have to give up). However they expect to be asked about smoking. MWs assume that if women are still smoking they won't want to quit. Half of pregnant women said that had not

	received consistent or sufficient information from their MW. MWs assume that they know the risks. Women want to know the "proper truth". Felt that an increase on visual information on the risks might encourage women to quit (S-3)
Herzig 2006, USA Study (Qualitative)	Focus groups of 49 O&G consultants and MWs to investigate methods of addressing alcohol use, drug use, smoking and domestic violence. Showed that maternity care providers found it easier to discuss smoking than the other issues (S-1)
Hyndman 2005, Canada Study (RCT)	138 nurses who provided routine pregnancy and post-partum care recruited from two hospitals. Hospitals were randomised to an intervention that aimed to increase adherence to clinical guidelines (academic detailing visits plus self-study package) or usual care. Multiple regression analysis showed that the intervention significantly enhanced adherence to practice guidelines ($p<0.001$) (S-3)
Jones 2012, UK Discussion	Core SSS is used rather than dedicated pregnancy advisors. Midwives refer pregnant smokers and specialist advisors contact clients twice by telephone, and send a letter if there is no response. Clients are fast tracked into an appointment to allow for the longest cessation period during their pregnancy. On-going 'maintenance' support, experience in the field suggests that very few clients attend follow-up appointments. Routine home visits by dedicated stop-smoking advisors are an expensive provision, unprecedented in behaviour change interventions, but they can enhance service reach (D-3).
Jordan 2006, USA Study (Survey)	125 O&G consultants (50% response rate) surveyed to assess perceptions and use of the 5As. Most always ask at each visit (62%) and advise (66%), fewer assess (42%) assist (29%) and arrange (6%). Barriers cited include lack of time, not knowing where to refer, pregnant smokers not responsive to suggestions, lack of reimbursement, previous failures, low confidence in ability to help, fear of offending women (S-2)
Lee 2006, UK Study (Survey)	Survey conducted on identifying examples of good practice in pregnancy services. Targeted services with the highest successes and found that they only had minimal genuine treatment in place. Three beacon service shared similar ingredients seen as necessary for such a service; training, NRT and multi session intervention (S-3)

Lin 2003, USA Study (Service audit)	Training staff in brief counselling led to better records but no effect on smoking among patients. There was a reduction in self-reported cigs/day. Pre-post comparison (S-no rating as limited information given)
Mantzari 2012, UK Study (Qualitative)	36 women involved in an incentives study were interviewed about their experience. Those incentivised used the SSS more often, were motivated by regular contact and feedback (being monitored). Non-incentivised women reported difficulty in getting NRT, which had a detrimental effect on their quit rates. Incentives seen as added bonus rather than the reason for quitting (S-3)
McGowan 2010, UK Study (Survey)	Glasgow pregnancy service, all women CO, smokers referred on opt-out basis for specialist treatment (NRT, phones and 2 visits to clinic). CO difficult for MWs (35% done), fine for auxiliary nurses (89% done). Of some 12,000 pregnant women, 1936 smokers referred, 386 (20%) attended, 370 set TQD and 117 (32%) quit at 4 weeks (S-3)
Owen 2001, UK Study (Survey)	Assessed the use of saliva cotinine in pregnant women (N = 1009). Saliva cotinines revealed under-reporting among pregnant women by about 3% (S-3).
Shipton 2009, UK Study (Retrospective)	Among a random sample of 3,475 pregnant Scottish women, 839 declared that they were smokers. The analysis of serum cotinine showed that 1,046 women were in fact smokers, i.e. 19.8% of smokers did not admit that they smoke (S-3).
Taylor 2001, UK Study (Survey)	An evaluation of the UK pregnancy service which showed no difference in efficacy of smoking cessation specialists who had or had not got a background in midwifery (S-3)

Valanis 2003, USA Study (Prospective)	Research derived smoking cessation intervention (STORK programme) in prenatal clinics, inpatient post-partum services, and paediatric services. Intervention was based on SOC and MI (but encouraged cutting down for those who did not want or were unwilling to quit). Involved screening, advice to quit, and documenting what cessation support was provided and/or used. Clinicians were assisted by booking forms that contained smoking specific fields and assessment and counseling forms. Audit and feedback was also in place to promote clinicians to act. The intervention increased advice to quit from 83% to 94%, which was sustained over the 3-year study period. Smoking brochures were the most frequently used intervention. Advice to quit was less frequent in the paediatric/post-natal setting (increased from 44% to 61%). The offer of cessation support was less frequent than screening. Documentation was a problem. Barriers: staff low self-efficacy, concerns about patient response, time, lack of conviction that the intervention was effective. (S-3)
Van Berkel 1999, Netherlands Study (Qualitative)	569 of 4863 consecutive patients with CVD were interviews 1.6 years after discharge. Smoking status was documented in 82% of patients. Documentation was more common in certain groups (e.g. males, those booked for bypass surgery). 57% received advice to quit. 59% of smokers surveyed at follow-up had quit (S-3)
Velasquez 2000, USA Study (Survey)	Assessed the training and implementation issues associated with a brief MI intervention delivered by nurses, social workers, and case managers who provide pre-natal care. One of the main barriers was HCPs who did not embrace the interventions. The authors suggest that it may be better to train only those who are interested. Other barriers included limited follow-up of trainees, organisational factors and competing priorities (S-2)
Wall 1995, USA Study (RCT)	49 paediatric practices (128 practitioners) randomised to give either minimal (written information in hospital about passive smoking and advice to quit) or extended (minimal intervention plus brief oral (two minutes) and written advice at 2 week, 2, 4, and 6 month routine ‘well baby’ visits) intervention. Extended group practitioners received 45 minutes training in smoking cessation. Mothers in extended intervention more likely to receive more materials and advice. 2,901 mothers enrolled. In the extended group, self-reported quitting at 6m was higher

	(4.7% v 2.1%), and relapse rates in recent quitters at enrolment were lower (53% v 63%). (S-3)
Walsh 1996, Australia Study (Prospective)	Of 204 MW-identified non-smokers, 166 gave urine samples. 13 had cotinine levels >282nmol/l suggesting that they were smokers (S-2)
Whitworth 2009, UK Discussion Discussion (Systematic review)	Cochrane Review on pre-conception health promotion on pregnancy outcomes. Only one study reported smoking cessation outcome. Overall there was no effect of intervention (D-3)
Windsor 2000, USA Study (Survey)	Used an evaluation template developed and applied to 4 published studies on smoking cessation in pregnancy. The greater the number of patient contacts required, the more problems there were. Staff motivation, low pay, no time/space a problem in one study. Regular training helped in another study (S-2)
Winickoff 2010, USA Study (RCT)	101 smoking parents of newborns. Parents in the intervention group received the in-hospital counseling session, 94% had a fax sent to a smoking cessation provider, and 36 (75%) accepted quitline enrolment. Of 36 parents who were reached at 3-month follow-up self-reported 24-hour quit attempts were higher in the intervention group versus control group (64% vs 18%; P = .005), and cotinine-confirmed 7-day abstinence rates were non-significantly higher in the intervention group (9%) compared to control (3%) (S-3)
Wisborg 1998, Denmark Study (RCT)	Quasi-random trial. Training MW had no impact on cessation, v non-trained MW. No process variables (S-1)

Appendix 4 – Table of Excluded Studies

The table below brief summarises the reasons for exclusion of studies.

Anon (Kai Tiaki Nursing Journal) (2011)	Setting is not in the scope of the review
Bech (1999)	Not available in English
Bishop (1999)	Duplicate of previous paper
Cummings (1989a)	Setting is not in the scope of the review
Cummings (1989b)	Setting is not in the scope of the review
Hafstad (1995)	Not available in English
Hasuo (2004)	Not available in English
Heegard (2001)	Commentary
Houston 2010	Setting is not in the scope of the review
Jimonez Ruiz (1994)	Not available in English
Kottke (1998)	Setting is not in the scope of the review
Lennox (1998)	Setting is not in the scope of the review
McAlpine (2008)	Survey of smoking cessation in UK hospitals only
Sinclair (1998)	Setting is not in the scope of the review
Strecher (1991)	Setting is not in the scope of the review
Wolfenden (2008)	Setting is not in the scope of the review
Wagner (2002)	Not smoking specific

Appendix 5 – List Studies Unavailable

The full text papers of the following studies could not be retrieved.

Anonymous (2004)
Allaway (1996)
Campbell (1991)
Campbell (2003)
Cohen (1987)
Gadomski (2010)
Giovino (1990)
Glover (2008)
Goldstein (1992)
Gordon (2011)
Grizeau (1998)
Gyenes (2005)
Haire-Joshu (1995)
Helwig (1998)
Hennrikus (2001)
Hodson (2002)
Holmes (2001)
Johnson (2006)
Latts (2002)
Lazenbatt (1991)
Lindsay (1989)
McCarty (2000)

McDaniel (2000)
Merrill (2010)
Miedinger (2011)
Morgan (2005)
Ragucci (2009)
Ripley-Moffitt (2010)
Shaughnessy (1999)
Shi (2011)
Stansby (2006)
Vial (2002)
Waller (1996)
Ward (2003)
Werrett (2005)
Wewers (1994)
Wewers (1997)
Whincup (1992)
Winstanley (2008)
Zahnd (1990)