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NICE

A Rapid Review of: The Cost-Effectiveness of National Health Services Treatments for Smoking Cessation in England

Final Report

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Executive Summary

Introduction

The National Institute for Clinical Excellence (NICE) has commissioned four Rapid Reviews on the cost-effectiveness of interventions to assist in smoking cessation. The Rapid Reviews cover the following areas:

- National Health Service (NHS) provided interventions;
- Non-NHS provided interventions;
- Workplace based interventions;
- Mass Media led interventions.

This review assesses the current evidence for the cost-effectiveness of smoking cessation interventions provided by the National Health Service (NHS).

Method

A comprehensive literature search was conducted for studies concerned with the cost-effectiveness of NHS treatments for smoking cessation in England and how the cost-effectiveness varies with age, sex, level of addiction, previous quit attempts, history of quitting and ethnicity. The cost-effectiveness of stop smoking interventions for pregnant women and manual workers were also examined. A total of 125 titles and abstracts were scanned and full paper copies of 22 studies were assessed for inclusion, with 6 identified as being relevant for the this Rapid Review. A further 12 papers were identified from the searches of for the other cost-effectiveness Rapid Reviews. Data were extracted from the studies and tabulated onto evidence tables (Section 6).

Results

Overall there was limited information concerning the cost-effectiveness of NHS interventions aimed at smoking cessation. The interventions focussed on physician-delivered interventions, interventions delivered in a hospital setting, other interventions and guidelines. All interventions were shown to be relatively cost-effective.

Physician-delivered advice was broken down into the following areas:

- Stage of change and physician advice;
- Advice given during routine physician visit;
- More intensive smoking cessation advice;
- The English smoking cessation service.

Studies investigating stage of change and physician advice were of high quality (two 1+, and one 2++ study). A UK study (1+) where GPs delivered either motivational advice or brief advice showed that the marginal cost per quitter was low at £451 [1]. This study was among the only two randomised controlled trials (RCTs) with economic evidence included in the systematic review carried out by Riemsma *et al*. 2003 [2] (1+). The third study was a cohort analysis (2++) that showed that assessing an individual's stage of change and directing interventions accordingly was cost-effective [3].

This review found four studies that report the cost-effectiveness of physician advice offered during a routine visit (three 1++ studies and 1+ study), two of which are old and the results

may no longer be relevant [4; 5]. A Cochrane review [6], published in 2005, found that there was not enough evidence to evaluate whether group interventions are more cost-effective than individual counselling sessions. A high quality economic analysis (1++) [7] showed that all five interventions (minimal counselling; minimal GP counselling and nicotine patches; intensive counselling by a trained counsellor; intensive counselling by a trained lung nurse plus two minutes stop advice from a lung specialist, and bupropion; and telephone counselling) investigated were cost-effective compared to current practice (the interventions ranged from minimal counselling to counselling plus nicotine replacement therapy (NRT) to telephone counselling).

One 1+ study and one 1++ study were reviewed that investigated more intensive smoking cessation advice delivered by a physician. One study investigated sending letters concerning smoking cessation and found that non-tailored letter increased cessation rates in a large general practice. Tailored letters were not as effective as non-tailored letters but did promote a shift towards cessation [8]. The second paper looked at NRT with general practitioner (GP) counselling [9] and showed that the interventions were cost-effective for all ages treated. This study was published in 1999 and the results may no longer be relevant

Two studies reviewed the cost-effectiveness of the English smoking service in 2001 (2++ and 2-). Although both were cohort analyses they suggest that the service was cost-effective. The cost per life year saved ranged from £601 to £766 for all ages [10; 11].

A health technology report (1++) [12], carried out in 2002, estimated the cost-effectiveness of NRT and / or bupropion sustained release (SR) compared to advice only. The results show that both interventions are cost-effective when compared to advice alone.

Three studies investigated smoking cessation offered in a hospital environment; two papers were carried out in the US and one in the UK. The quality of these papers was modest (one 1+, one 2- and one 2+ study) and the results should be viewed with caution. The 1+ study compared bedside counselling to usual care and concluded that brief advice was inexpensive and cost-effective [13]. The other two cohort studies showed that a nurse case managed smoking cessation programme in a hospital was inexpensive and resulted in a reduction in smoking. A hospital smoking cessation counsellor would result in a cost per life year saved of between £340 and £426 [14; 15].

There is some evidence to suggest that high intensity interventions are more cost-effective than low intensity interventions (one 1+ study) [16]. Smoking cessation guidelines have been shown to be cost effective in the US (1++) [17].

The cost-effectiveness of NHS smoking cessation services varies by age and gender. The cost-effectiveness of physician-delivered counselling during a routine office visit appears to be greatest for men aged 50-54 and women aged 55-59 (1+) [4], although this paper is rather dated. It is suggested that men aged between 40-49 and women aged between 50-54 will receive the greatest benefit from allowing GPs to prescribe nicotine patches (1++) [9].

A pilot study aimed at pregnant women (2-) [18] showed that proactive calls and counselling resulted in a trend towards smoking cessation. Counselling new mothers about the effect that smoke has on their babies was shown to be effective for both minimal and extended interventions. The authors reported that, whilst it was not possible to gather cost data for this study, costs would include: training, time involved for the staff to give the counselling and materials.

Evidence Statements

The results of the evidence, discussed in Section 4, are summarised in the evidence tables below. These are the key findings only and further details are provided in Section 4.

No	Statement	Grade	Evidence (cross-referencing page in text)	Author
	Overall there was limited information concerning the cost-effectiveness of interventions aimed at smoking cessation.			
1	**Stage of change and physician advice** Assessing an individual's stage of change and directing interventions accordingly is cost-effective.	One 2++ study, one 1+ study	Pages 9 to 13.	Buck *et al.* 2000 Butler *et al.* 1999
2	**Advice given during routine physician visit** There is not enough evidence to evaluate whether group interventions are more cost-effective than individual counselling sessions.	One 1++ study	Page 17.	Stead and Lancaster, 2005
3	Physician-offered smoking cessation interventions are cost effective.	One 1++ study	Page 14.	Freenstra *et al.* 2005
	More intensive smoking cessation advice			
4	There is some evidence to suggest that NRT with GP counselling is cost-effective for all ages.	One 1++ study.	Page 18.	Stapleton 1999
	The English smoking cessation service			
5	There is some evidence to suggest that, in 2001, the English smoking cessation service was cost-effective.	One 2++ and one 2- study.	Page 19 to 20.	Godfrey *et al.* 2005 Stapleton 2001
	Hospital setting			
6	Smoking cessation advice offered in a hospital setting is cost-effective.	One 1+, one 2+ and one 2- study.	Page 22.	Meenan *et al.* 1998
	High intensity versus low intensity			
7	There is some evidence to suggest that high intensity interventions are more cost-effective than low intensity interventions.	One 1+ study,	Page 24.	Alterman *et al.* 2001

No	Statement	Grade	Evidence (cross-referencing page in text)	Author
	Guidelines			
8	There is some evidence to suggest that guidelines on smoking cessation are cost-effective in the US.	One 1++ study.	Page 25.	Cromwell *et al.* 1997
	Gender and age			
9	Although the level of cost-effectiveness of NHS smoking cessation interventions varies with age and gender, they are always cost-effective.	Two 1++ studies.	Page 28.	Stapleton 1999 Wasley *et al.* 1999
10	There is some evidence to suggest that the cost-effectiveness of physician-delivered counselling during a routine office visit is greatest for men aged 50-54 and women aged 55-59.	One 1+ study.	Page 28.	Cummings *et al.* 1989
11	It appears that men aged 40-49 and women aged 50-54 will receive the greatest benefit from allowing GPs to prescribe nicotine patches.	One 1++ study.	Page 17 and 28.	Wasley *et al.* 1999
	Pregnant women			
12	The evidence suggests that proactive calls result in trend towards smoking cessation.	One 2- study.	Page 29.	Buchanan 2002

Section 1: Introduction

1.1 BACKGROUND

NICE is undertaking a series of Rapid Reviews on the evidence to support smoking cessation treatments. This is to identify the optimal provision of smoking cessation services to all smokers and, in particular, to specific population groups (i.e. manual working groups, pregnant smokers and hard to reach communities). This will also contribute towards guidance on the provision of smoking cessation treatment. The Rapid Reviews are being undertaken on the following areas:

- National Health Service (NHS) provided interventions;
- Non-NHS provided interventions;
- Workplace based interventions;
- Mass Media led interventions.

This review assesses the current evidence for the cost-effectiveness of smoking cessation interventions provided by the National Health Service (NHS).

1.2 SELECTION OF INTERVENTIONS TO REVIEW

The choice of interventions to review was based on the review of the effectiveness of NHS treatments which precedes this review[1].

In the preceding effectiveness review the following definition of a NHS stop smoking service was used (see Table 1.1).

[1] Bell, K; McCullough, L; Greaves, L; Jategaonkar, N; DeVries, K. The effectiveness of national health services intensive treatments for smoking cessation in England. NICE rapid review. June 2006.

Table 1.1: Definition of NHS stop smoking services, as provided by the effectiveness rapid review*

Definition	Explication of terms
A specialist NHS-supported service	An NHS-funded service in some way provided by specially trained staff. Staff comprise of: 1)'core' specialist advisors employed full time in the service 2)'community advisors' (such as pharmacists and GP practice nurses) employed part time in service.
With staff who have nationally-recognised training and dedicated time	'Nationally-recognised' would refer local training. In theory all community and core advisors receive formal training. In reality, their levels of training often differ. Community advisors, in particular, may receive less formal training and they may also receive less 'on the job' training, because of their part-time involvement in the services.
For group and one-to-one support	Evidence and current guidelines support group work, but one-to-one is desirable in some cases and because of geographical constraints. Community advisors invariably provide one-to-one sessions, whereas the core specialist services also offer group sessions.
For a series of planned sessions	This would normally be a minimum of four, usually around seven sessions where the first and last would generally last at least 20 minutes. However, the support provided by community advisors tends to be less structured and intense than that provided by the core advisors. Therefore, 'intensive' interventions may actually entail different levels of intensity depending on the context in which they are being delivered.
Where the client is followed up at one month, three months and one year post-quit date and the data are recorded	This would ideally include carbon monoxide (CO) validation at one month.

* Table adapted from Bell *et al.*

The following interventions were analysed:

- All smoking cession interventions aimed at populations in England and the UK;
- Interventions that take place through the NHS;
- Intensive interventions for smoking cessation conducted through the NHS;
- Intermediate interventions for smoking cessation conducted through the NHS;
- Smoking cessation interventions aimed at pregnant women;
- Smoking cessation interventions aimed at black and minority ethnic groups (BMEG);
- Smoking cessation interventions aimed at manual and routine groups.

Section 2: Research Questions

2.1 QUESTION 1

What is the cost- effectiveness of NHS treatments for smoking cessation in England?

2.2 SUB QUESTIONS

- How does the cost-effectiveness of NHS treatments vary with:
  - Age?
  - Sex?
  - Level of addiction?
  - Previous quit attempts?
  - History of quitting?
  - Ethnicity?
- What is the cost-effectiveness of stop smoking interventions for pregnant women?
- What is the cost-effectiveness of stop smoking interventions for routine and manual workers?

Section 3: Methodology

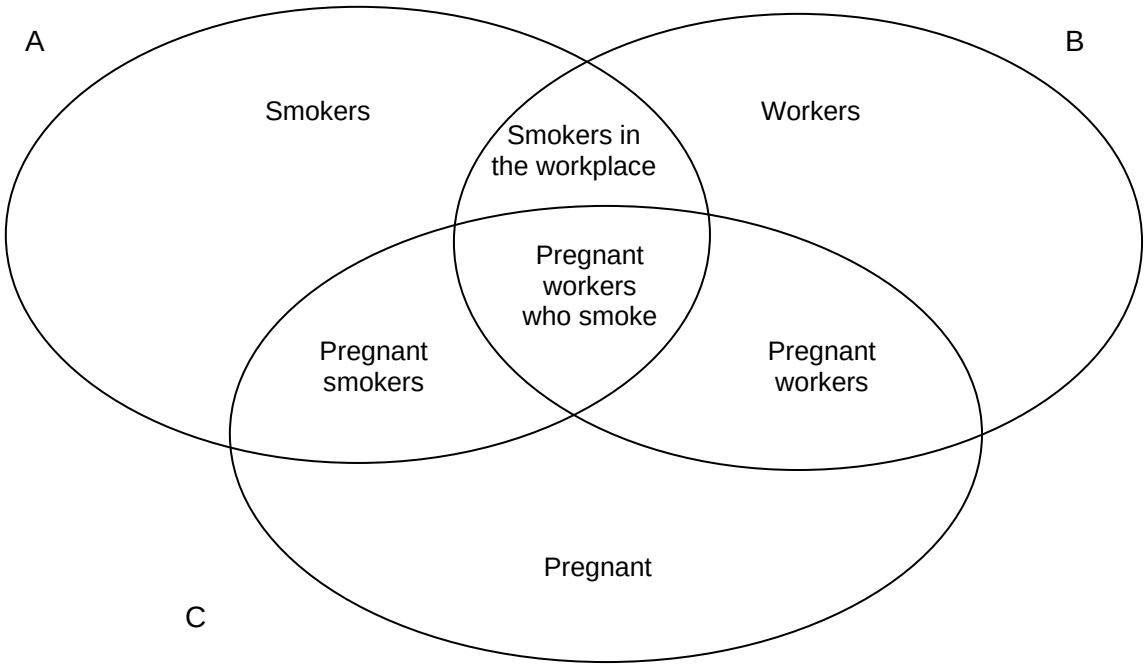
3.1 DATA SOURCES AND SEARCH STRATEGIES

The following information sources were searched:

- NHS Economic Evaluation Database (NHS EED);
- Centre for Reviews and Dissemination (CRD) internal database;
- The results of the original effectiveness review.

The search strategies are shown in Section 8. Pregnant women and manual workers were not included as a specific search terms. However, papers concerning these groups would have been identified by the search undertaken. This can be demonstrated by using a simple example, see Figure 1.1. Here 'A' and 'B' represent the search undertaken for workplace smokers. It can be seen that this search will have identified all smokers, including pregnant smokers. If the search term had specified pregnant smokers the search strategy would have only identified pregnant workers who smoke (the middle section of Figure 1.1).

Figure 1.1: Pregnant women search strategy



The data were extracted from the studies and tabulated onto the evidence table, (see Section 6). Data on participants, study design and outcomes and cost-effectiveness were extracted.

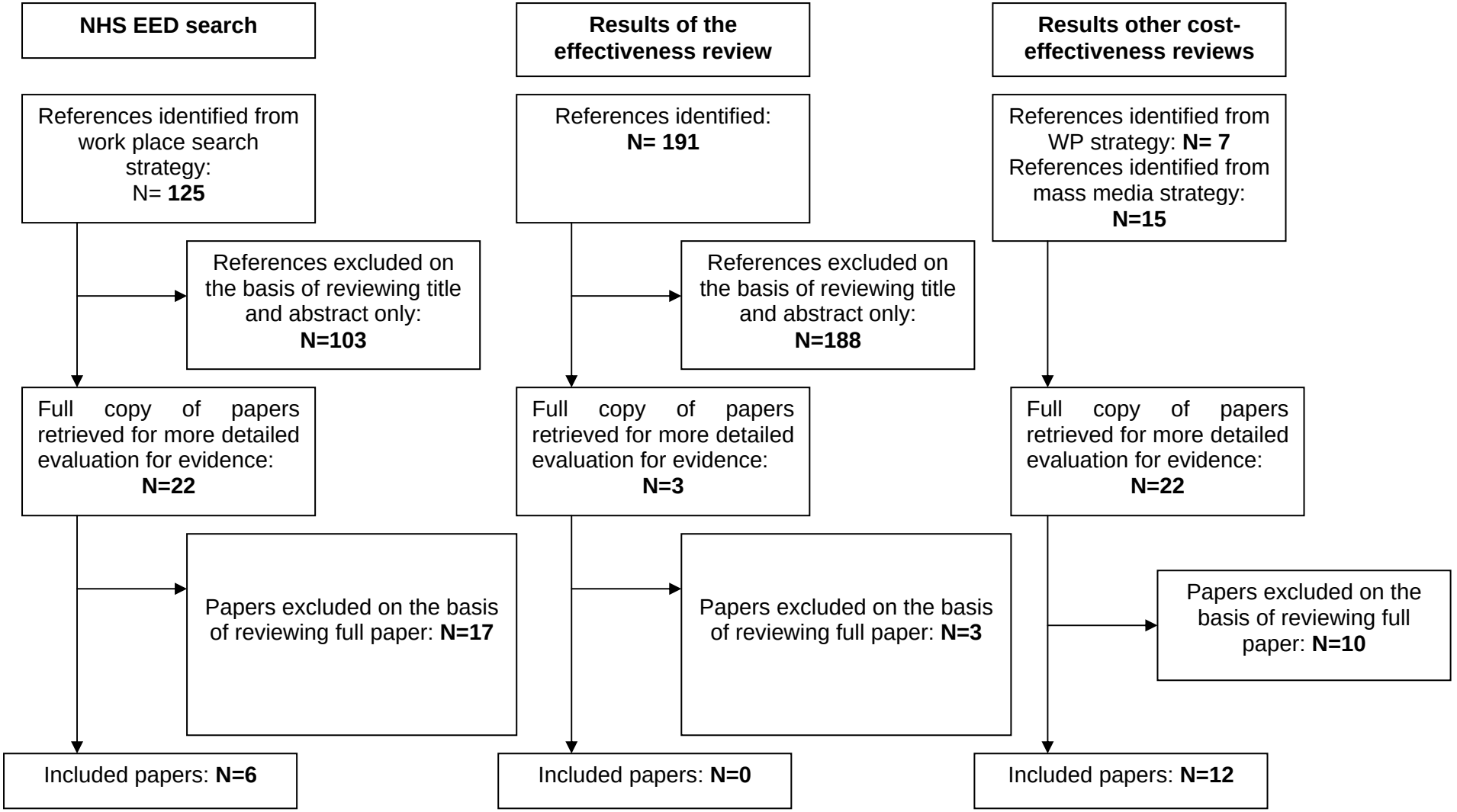
3.2 PARAMETERS FOR REVIEW

The criteria for inclusion of papers in this review were:

- Studies were required to have a defined intervention to assist smoking cessation;
- The study population were smoking at the start of the study (although if drawn from a general population it is accepted that some may not smoke);
- Studies were included if they reported both the costs and effectiveness of an intervention to assist smoking cessation (although costs and effectiveness were not necessarily required to have been combined into a single cost-effectiveness ratio).

3.3 STUDY FLOW

A flow diagram detailing the outcome of the initial studies identified from the database search is shown below. The NHS EED searches and searches of the effectiveness review identified 25 potentially relevant references. On the basis of reviewing the title and abstract (of these papers and those identified for the searches for the other cost-effectiveness reviews) 18 full text papers were obtained for further assessment.


NHS EED search
References identified from work place search strategy: N= 125
References excluded on the basis of reviewing title and abstract only: N=103
Full copy of papers retrieved for more detailed evaluation for evidence: N=22
Papers excluded on the basis of reviewing full paper: N=17
Included papers: N=6
Results of the effectiveness review
References identified: N= 191
References excluded on the basis of reviewing title and abstract only: N=188
Full copy of papers retrieved for more detailed evaluation for evidence: N=3
Papers excluded on the basis of reviewing full paper: N=3
Included papers: N=0
Results other cost-effectiveness reviews
References identified from WP strategy: N= 7
References identified from mass media strategy: N=15
Full copy of papers retrieved for more detailed evaluation for evidence: N=22
Papers excluded on the basis of reviewing full paper: N=10
Included papers: N=12

3.4 QUALITY APPRAISAL

All of the studies that met the inclusion criteria were rated by two independent reviewers in order to determine the strength of the evidence. Once the research design was determined (using the NICE algorithm), studies were addressed for their methodological rigour and quality based on the critical appraisers' checklists provided in Appendix B of the Public Health Guidance Methods Manual (see Table 3.1). Each study was categorised by study type and graded using a code '++', '+' or '-', based on the extent to which the potential sources of bias had been minimised. Health economic appraisal forms for the included papers are shown in Appendix A. (To follow)

Table 3.1: Level and quality of evidence

Type and quality of evidence	
1++	High quality meta-analyses, systematic reviews of RCTs, or RCTs (including cluster RCTs) with a very low risk of bias
1+	Well conducted meta-analyses, systematic reviews of RCTs, or RCTs (including cluster RCTs) with a low risk of bias
1–	Meta-analyses, systematic reviews of RCTs, or RCTs (including cluster RCTs) with a high risk of bias
2++	High quality systematic reviews of these types of studies, or individual, non- RCTs, case-control studies, cost benefit analysis (CBA) studies and correlation studies with a low risk of confounding, bias or chance and a high probability that the relationship is causal
2+	Well conducted non-RCT, case control studies, cohort studies, cost benefit analysis (CBA) studies and correlation studies with a low risk of confounding, bias or change and a moderate probability that the relationship is causal
2-	Non-RCTs, case control studies, cohort studies, CBA studies, ITS and correlation studies with a high risk – or chance – of confounding bias, and a significant risk that the relationship is not causal
3	Non- analytic studies (for example, case reports, case series)
4	Expert opinion, formal consensus
Grading the evidence	
++	All or most of the quality criteria have been fulfilled. Where they have been fulfilled the conclusions of the study or the review are thought to be very unlikely to alter
+	Some of the criteria have been fulfilled. Where they have been fulfilled the conclusions of the study or the review are thought unlikely to alter
-	Few or no criteria fulfilled. The conclusions of the study are thought to be likely or very likely to alter

3.5 SYNTHESIS

Due to the heterogeneity of design among the studies, a narrative synthesis was conducted.

3.6 CURRENCY CONVERSION

In order to allow direct comparison of results all results have been adjusted and converted from local currencies to UK £2006 prices. This was done via a two step process:

- First costs were converted to British pounds using a historical conversion rate (http://www.oanda.com/convert/fxhistory);
- The costs were then inflated to January 2006 pounds (http://www.statistics.gov.uk/statbase/tsdataset.asp?vlnk=229&More=).

All costs in section 4 are first reported as they appear in the original study with the British 2006 pounds in brackets next to them.

Section 4: Summary of Findings

Overall there was limited information concerning the cost-effectiveness of NHS-related interventions aimed at smoking cessation.

4.1 QUESTION 1: WHAT IS THE COST- EFFECTIVENESS OF NHS TREATMENTS FOR SMOKING CESSATION IN ENGLAND?

A total of 18 papers have been included in the rapid review. There were five RCTs, one non-RCT, five cohort studies, two economic models where the data were drawn from meta-analyses, one economic model where the data were drawn from RCTs, three economic models and one systematic review of RCTs. Studies were carried out in the Netherlands, Australia, the USA and the UK.

The interventions focussed on the following areas:

- Physician-delivered interventions;
- Interventions delivered in a hospital setting;
- Other interventions;
- Guidelines.

4.1.1 Physician-delivered interventions

A total of twelve of the 18 papers aimed to investigate smoking interventions delivered by a physician, falling into the following areas:

- Stage of change and physicians advice;
- Advice given during a routine physician visit;
- More intensive smoking cessation advice;
- The English smoking cessation service;
- Health Technology assessment comparing NRT and or bupropion SR to advice.

Stage of change and physicians advice

Stage-based interventions are behavioural interventions that identify an individual's readiness to change such that the relevant process can be applied to the individual.

Buck *et al.* 2000 [3] (2++) assessed the cost-effectiveness of a smoking cessation programme delivered by physicians in the US (using 1995 dollars). Physicians were trained to assess the 'stage' (readiness to change) of their smoking patients and advice was given accordingly:

- ‘Pre-contemplative’ smokers were given a not ready booklet and invited to return when they were ready;
- ‘Contemplative’ smokers were given a not sure booklet and a brief motivational interview;
- ‘Prepared’ smokers were given a ready booklet and received a programme of three visits of cognitative behavioural strategies and advice on how to use nicotine chewing gum.

There were 2092 ‘pre-contemplative’ smokers, 2633 ‘contemplative’ and 1804 ‘prepared smokers at the start of the study. ‘Prepared’ smokers were contacted 12 months after intervention, via telephone, to determine smoking status. Of the ‘prepared smokers 840 dropped out due to missing bookmarks, a further 236 were lost to follow-up, leaving 728 participants. At 12 months, 22% of the ‘prepared’ smokers followed up were abstinent (this was 21% after applying a validation rate of 5%, and reduced further to 13% to take account of natural abstinence). The total number of smokers who were abstinent (261) used in the cost-effectiveness study was derived as follows:

- 13% of the 728 followed up smokers, gives 95 abstinent;
- 13% of the 194 who ‘missed’ follow-up due to reasons unlikely to affect the abstinent rate gives 25 abstinent;
- The remainder of those who ‘missed’ follow-up were assumed to lead to no abstinences;
- Of the 840 people missing booklets (bookmarks) it was assumed that 6.5% were abstinent, giving a further 55 abstinent;
- It was assumed that a quarter of the people given the brief intervention (‘contemplative’ smokers) were abstinent, giving a further 86 abstinent.

The total cost of the intervention and the cost per quitter are shown in Table 4.1. The physician-delivered intervention appeared to be cost-effective, even when more pessimistic scenarios were used.

Table 4.1: Total cost of a stage based intervention (1995 dollars (UK £2006))

Cost applies to the:	Total cost	Cost-effectiveness	
		Cost per additional quitter (including training costs)	Cost per additional quitter (excluding training costs)
Organiser	$30,927 (£19,255)	$118 (CI: $106-134) [£73 (CI: £66 – 83)]	$0
Physician	$72,810 (£45,685)	$279 (CI: $249-317) [£174 (CI: £155– 197)]	$183 (CI: $164-208) [£114(CI: £102 – 129)]
Pre-contemplative smokers	$655 (£408)	N/A	N/A
Contemplative smokers	$1,646 (£1,025)	N/A	N/A
Prepared smokers	$23,429 (£14,587)	N/A	N/A
Smoker	N/A	$99 (CI: $88-112) [£62 (CI: £55 – 70)]	$99 (CI: $88-112) [£62 (CI: £55 – 70)]
All parties	N/A	$496 (CI: 443-563) [£309 (CI: £276 – 351]	$281 (CI: 252-320) [£175 (CI: £157 – 199)]

In an RCT carried out in the UK, Butler *et al.* 1999 [1] (1+) compared the clinical and cost-effectiveness of motivational consulting with brief advice delivered by a GP. All smokers were invited to participate in the trial. The cost year for the study is not reported and is therefore taken to be 1999, year of publication. 536 patients gave consent to be included in the trial (266 were randomised to receive brief advice and 270 to motivational counselling). After two weeks 8.6% of those in the brief counselling group were lost to follow-up compared to 12.2% in the motivational counselling group. After six months 20.3% of those in the brief counselling group were lost to follow-up compared to 23.7% in the motivational counselling group. Once the smoker's 'stage of change' was assessed they were allocated to one of the intervention groups using sealed envelopes. Details of the intervention groups are as follows:

- Motivational consulting:
  - Phase 1 - patients were invited to numerically rate their motivation and confidence to quit smoking;
  - Phase 2 - based on the above scores clinicians used specific questions and strategies, with the aim of building motivation and confidence by encouraging patients to identify arguments for change or practical attainable steps for quitting;
  - Phase 3 - involved inviting patients to set meaningful targets.
- Brief advice:
  - The following statement was used for brief advice: 'smoking is an extremely serious matter. Apart from lung cancer, smoking can damage you health in many other ways. If you give up now, a lot of the harm can be undone. It is my professional duty to tell you that you must give up smoking in the interest of your future health'.

Details of the percentage of people in each 'stage of change' at baseline and the six month follow-up are provided in Table 4.2. The table shows that at six months people were more likely to be in a more ready stage of change.

Table 4.2: Percentage of participants in each 'stage of change'

Stage of change'	At baseline (%)		At six month follow-up (%)	
	Brief advice	Motivational consulting	Brief advice	Motivational consulting
Pre-contemplation	53.2	49.4	48.3	40.8
Contemplation	23.8	28.6	37.3	39.3
Preparation	9.4	10.4	11.4	13.3
Action	13.6	11.5	3.0	6.6

Table 4.3 demonstrates that successful outcomes from motivational consulting in relation to brief advice appear to be greater among 'pre-contemplators' compared with 'contemplators'.

Table 4.3: Differences in effect of motivational consulting by stage of change

	'Pre-contemplation' odds ratio	'Contemplation' odds ratio	p-value
Self-report smoking in the previous month	4.30 (0.95% CI: 0.78 – 24.16)	1.22 (0.95% CI: 0.30 – 5.03)	0.15
Self-report no smoking in previous 24 hours	5.41 (0.95% CI: 1.72 – 17.01)	1.49 (0.95% CI: 0.46 – 4.79)	0.09
Quit attempt	1.84 (0.95% CI: 1.19 – 2.86)	0.84 (0.95% CI: 0.48 -1.47)	0.03
Two or more quit attempts	1.49 (0.95% CI: 0.72 – 3.06)	0.70 (0.95% CI: 0.41 – 1.21)	0.09
Quit attempts of one week or longer	2.71 (0.95% CI: 1.00 – 7.35)	1.22 (0.95% CI: 0.58 - 2.55)	0.15
Delays smoking >5 minutes after waking	2.70 (0.95% CI: 0.89 – 8.21)	1.97 (0.95% CI: 0.78 – 5.00)	0.71
Reduced smoking	1.43 (0.95% CI: 0.81 – 2.54)	0.77 (0.95% CI: 0.44 – 1.37)	0.05

At the six-month follow-up, 1.5% of the brief advice group had been abstinent in the previous month (self report) versus 3% in the motivational counselling group; 3% of the brief advice group were abstinent during the previous 24-hours versus 8.1% in the motivational counselling group. The additional cost of motivational counselling compared to brief advice was £23.11 (£27); the marginal cost per quitter was £450.56 (£533) (£265 (£314) using the extra consulting time cost only); the marginal cost per reduction in addiction was £279.63 (£331) (£164.44 (£195) without training costs); and the marginal cost per quit attempt was £311.99 (£369) (£183.47 (£217) without training costs). The authors concluded that motivational counselling produced better outcomes than offering brief advice, especially for those 'not ready' to quit

Riemsma *et al*. 2003 [2] (1+) carried out a systemic review of the stage-based interventions to promote smoking cessation. Individuals were separated into five stages:

1. Pre-contemplation;
2. Contemplation;
3. Preparation;
4. Action;
5. Maintenance.

Individuals progress through the stages in a sequential manner (although they could relapse to an earlier stage) and an individual's stage was assessed regularly. It was thought that interventions that take into account an individual's current 'stage' will be more effective than a 'one size fits all' intervention. Two of the 23 RCTs included in the review, included an economic evaluation:

- Butler *et al*. 1999 [1] evaluated motivational consulting delivered by a GP. They found that the marginal cost per person who quit was £450.65 (£533). With increased use, this could fall to £265 (£314) (see above for full review of the papers). This paper is described in full above.
- Sinclair *et al.* 1999 [19] studied pharmacists who gave tailored advice, based on the stage of change, on smoking cessation. The incremental cost-effectiveness ratio was £300 (the country and cost year is not provided) per person who quit. Riemsma does not provide full details of the methodology used within the paper, other than the fact that there was no significant difference between the stage based interventions versus no intervention.

Advice given during a routine physician visit

Cummings *et al.* 1989 [4] (1+) carried out an economic analysis using a hypothetical cohort of patients to determine the cost-effectiveness of physician counselling on smoking cessation during a routine four-minute office visit (using 1984 dollars). A societal perspective was used in the study (the net social costs of physician's advice against its net effectiveness, in terms of additional years of patient life expectancy, was measured). A self-help booklet was given to all of the patients who received the brief advice. The quoted one-year cessation rate (2.7%) from brief advice was taken from the results of three previous randomised trials. The authors assumed that 10% (based on the authors assumptions) of patients who had abstained for one year would eventually relapse and that they would gain none of the health benefits of stopping smoking. The intervention cost $17 (£28) per patient. The results show that:

- The cost per life year saved range from:
  - $705 (£1,181),aged 50-54 to $988 (£1,655), aged 35-39 for men;
  - $1,204 (£2,068), aged 55-59 to $2,058 (£3,447), aged 35-39 for women.
- The incremental cost per life year saved of a follow-up visit regarding smoking cessation range from:
  - $421 (£705) (assuming a 12% increase in cessation rate) to $5,051 (£8,460) (assuming a 1% increase in cessation rate) for men;
  - $772 (£1,293) (assuming a 12% increase in cessation rate) to $9,259 (£15,508) (assuming a 1% increase in cessation rate) for women.

Key parameters were changed in the sensitivity analysis to reflect a 'worst-case' analysis (increasing the cost per patient to $45 (£75), a 1% point gain in smoking cessation and a 50% relapse rate) and resulted in a cost per year of life saved ranging from $12,857 to $18,000 (£21,534 to £30,148) for men and from $21,951 to $37,500 (£36,765 to £62,208) for women. The authors note that the assumption that only 2.7% of smokers would quit is low (4-10% is normally used) and they may have overestimated the costs of the brief advice. This study is more than a decade old and, therefore, the results may not be relevant to the current scenario.

In an economic analysis to determine the cost-effectiveness of smoking interventions in the Netherlands, Feenstra *et al.* 2005 [7] (1++) investigated five face-to-face interventions compared to current practice for smoking cessation advice offered by GPs (using 2000 euros). The results are shown in Table 4.4. Details of the interventions are as follows:

- MC = minimal counselling, lasting 12 minutes, provided by a GP;
- MC + NRT = minimal GP counselling and nicotine patches or gum for eight weeks;
- IC + NRT = intensive counselling by a trained counsellor, lasting 90 minutes plus two minutes stop advice from a lung physician, and NRT for twelve weeks;
- IC + Bupr = intensive counselling by a trained lung nurse plus two minutes stop advice from a lung specialist, and bupropion for nine weeks;
- TC = telephone counselling, consisting of one 30 minute call and six follow-up calls of 15 minutes each.

Compared to current practice the minimal GP counselling was a dominant intervention, generating both gains in quality-adjusted life years (QALYs) and life years, with lower costs. The incremental cost per QALY gained of the other interventions ranged from €1,100 (£758) for the telephone counselling to €4,900 (£3,377) for the intensive counselling with nicotine patches or gum, when a 75-year time horizon was used. All five interventions are cost-effective compared to current practice. The minimal GP counselling was also shown to be a dominant intervention, compared to current practice, when a one-year and ten-year implementation time horizon was used.

Table 4.4: Feenstra results (Euros 2000 price level (UK £2006)), permanent implementation (75 years)*

Intervention	Cost per quitter for each intervention	Life years gained (x 10^3)	QALYs gained (x 10^3)	Intervention cost (x 10^9)	Intervention cost per life year gained	Intervention cost per QALY gained	Savings from treatment aversion (x10^9)	Costs per life year gained	Costs per QALY gained
MC	450 (£310)	330	410	0.52 (£0.36)	1,600 (£1,103)	1,300 (£896)	1.4 (£0.97)	Dominates current practice	Dominates current practice
MC + NRT	1,750 (£1,206)	620	780	3.8 (£2.6)	6,100 (£4,205)	4,800 (£3,309)	2.7 (£1.8)	1,800 (£1,241)	1,400 (£965)
IC + NRT	2,970 (£2,047)	740	940	7.8 (£5.4)	10,500 (£7,237)	8,300 (£5,721)	3.2 (£2.2)	6,200 (£4,274)	4,900 (£3,377)
IC + Bupr	2,410 (£1,661)	840	1,100	7.3 (£5.0)	8,600 (£5,928)	6,800 (£4,627)	3.6 (£2.5)	4,300 (£2,964)	3,400 (£2,344)
TC	1,640 (£1,130)	310	380	1.7 (£1.2)	5,700 (£3,929)	4,600 (£3,130)	1.3 (£0.90)	1,400 (£965)	1,100 (£758)

*Table reproduced from Feenstra *et al.*

An economic analysis carried out by Wasley *et al.* 1997 [5] (1++) aimed to investigate the cost-effectiveness of nicotine patches as an adjunct to brief physician counselling during routine office visits in the US (using 1995 dollars). A hypothetical sample of 400 smokers who smoked 20 or more cigarettes per day was included in the model. Two interventions were compared; the first involved participants who were offered a prescription for the nicotine patch and brief counselling by their physician (group 1); and the second involved participants who were only offered brief counselling by their physician (group 2). The baseline assumptions used in the model were as follows:

- 12-month abstinence for group 2 was 4.5% [20];
- 12-month abstinence for group 1 was 17.3% [20];
- Relapse rate after one year of successful abstinence was 35% [21];
- Treatment lasted eight weeks (assumption);
- 1% of the 400 smokers would quit smoking, each year, in the absence of patch use and brief counselling [22];
- Cost of the patch was $4 (£3);
- Take up rate for the patch was 25% (assumption);
- Compliance rate was 50% [23];
- Physicians' time was valued at $11.64 (£10) per five minutes [24-27];
- Discount rate of 5% was applied to the future life gains. Costs were not discounted as they were assumed to occur in the same year.

Table 4.5 shows the results of the study and Table 4.6 shows the results by age and gender. The data indicate that men aged between 45 and 49 years old and women aged between 50 and 54 years old will receive the optimal benefit from either therapy.

Table 4.5: Results from Wasley *et al* (1995 dollars (UK £2006))

Group	Number who quit	Total cost for the 400 smokers	Average cost per life year saved (LYS)	Incremental cost per LYS
Nicotine plus counselling	20.2	$21,456 (£18,090)	Ranged from $965 to $1,585 (£810 to £1,331) for men and $1,634 to $2,360 (£1,372 to £1,981) for women	Ranged from $1,796 to $2,949 (£1,508 to £2,476) for men and $3,040 to $4,391 (£2,552 to £3,687) for women
Counselling only	11.7	$4,656 (£3,909)	Ranged from $362 to $594 (£304 to £499) for men and $612 to $884 (£514 to £742) for women.	N/A

Table 4.6: Results of the Wasley study, by gender for 5% discount rate (1995 dollars (UK £2006)) *

Age at intervention	Average cost per life years saved (LYS)				Incremental cost per LYS, with the addition of patches to physician counselling ($)	
	Nicotine plus counselling ($)		Counselling only ($)			
	Men	Women	Men	Women	Men	Women
35 - 39	1,051 (£882)	1,967 (£1,651)	394 (£331)	737 (£619)	1,956 (£1,642)	3,659 (£3,072)
40 - 44	993 (£834)	1,770 (£1,486)	372 (£312)	663 (£557)	1,847 (£1,551)	3,293 (£2,765)
45 - 49	965 (£810)	1,659 (£1,393)	362 (£304)	622 (£522)	1,796 (£1,508)	3,088 (£2,593)
50 - 54	993 (£834)	1,634 (£1,372)	372 (£312)	612 (£514)	1,847 (£1,551)	3,040 (£2,552)
55 - 59	1,095 (£919)	1,686 (£1,416)	410 (£344)	632 (£531)	2,037 (£1,710)	3,137 (£2,634)
60 - 64	1,280 (£1,075)	1,896 (£1,592)	480 (£403)	711 (£597)	2,381 (£1,999)	3,529 (£2,963)
65 - 69	1,585 (£1,331)	2,360 (£1,981)	594 (£499)	884 (£742)	2,949 (£2,476)	4,391 (£3,687)

***** Only the benefits are discounted as the costs occur in the same year.

Stead and Lancaster, 2005, [6] (carried out a literature review to determine the effects of smoking cessation programmes. The authors compared:

- 'Self help' to 'no intervention';
- Group therapy to individual therapy.

The authors also aimed to determine whether specific components increased the effectiveness of group therapy and the rate at which offers of group therapy were taken up. The authors found that group therapy was more effective in assisting people to stop smoking compared to self-help and other, less intensive, interventions. The authors comment that there was no evidence to evaluate whether groups are more effective, or cost-effective, than intensive individual counselling. It is also suggested that there was not enough evidence to support the use of particular psychological components (such as cognitive and behavioural skills) in a programme beyond the support and skills training normally included.

More intensive smoking cessation advice

Scott Lennox *et al.* 2001 [28] (1+) developed and evaluated a computerised system for generating tailored letters regarding smoking cessation in a primary care setting in the UK (using 1993 pounds). 2,553 smokers aged between 17 and 65, from six general practice centres in Aberdeen, Scotland were included in the study. Participants were sent a questionnaire asking them about their current smoking behaviour, attitudes to smoking, barriers to quitting and intention to quit in the next six months. Once questionnaires were received, participants were randomised to one of the following groups.

- A computer-tailored letter;
- A computer non-tailored letter;
- No letter.

The tailored and non-tailored letters included sections on the desire to quit; motivation; confidence building; and advice on stopping. The tailored letters were tailored according to the information the participants provided in the initial questionnaire. The control group ('no letter' group) received a letter thanking them for their participation and letting them know that they would receive information at the end of the study, for example a tailored or non-tailored letter. Cessation rates at six months were:

- 3.5% (95% CI, 2.3-4.7) for the tailored group;
- 4.4% (95% CI, 3.0-5.8) for the non-tailored group;
- 2.6% (95% CI, 1.5-3.7) for the 'no letter' group.

For those who smoked <20 cigarettes per day the cessation rate was:

- 66% greater in the non-tailored compared to the tailored group;
- 87% greater in the non-tailored compared to the 'no letter' group, for participants.

For heavy smokers who did not quit the letters helped to promote an increase in the intention to quit. The increase in cost per additional quitter in the non-tailored letter group compared with the 'no letter' group was £89 (£125). The non-tailored letter increased cessation rates in a large general practice. The tailored letter was not as effective as the non-tailored letter but did promote a shift towards cessation.

Stapleton 1999 [9] (1++) estimated the cost-effectiveness for the UK NHS allowing GPs to prescribe nicotine patches for up to 12 weeks. Although NRT is not within the scope of our rapid review, this study has been included because the intervention includes GP counselling. 1,200 patients were randomly assigned nicotine patches or placebo patches. Patients also received physician delivered counselling and a booklet on how to stop smoking. Participants met with a GP or nurse at weeks 0, 1, 3, 6, 12, 26 and 52 (all participants met with the GP at the beginning of treatment). The counselling was given either in a group or on a one-to-one basis. Claims of abstinence were validated by low breath CO concentration (<10 parts per million (ppm)). The nicotine patches doubled the chance of cessation for at least 12 months. Some of the components in the cost of the intervention are described below, were:

- The average time spent counselling and prescribing the patch was 31 mins;
- The average time spent on counselling alone was 25 mins;
- The percentage of treatment time with the GP was 67%;
- The cost per minute with the GP was £1.77 vs. £0.43 for the nurse;
- The average number of weeks the nicotine patches were used was 4.4;
- The cost of one week of nicotine patches to the NHS was £9.07;
- The pharmacy fee to the NHS for each prescription was £0.94;
- The percentage of patients exempt from the prescription fee was 30%;
- The cost of the patient booklet was £0.20;
- The cost of the biochemical validation of smoking cessation was £1.00.

The results are shown in Table 4.7, below, and show that the intervention is cost-effective for all ages when treated. The results apply to those smoking 15 or more cigarettes per day (the study focused on heavy smokers only).

Table 4.7: Results from Stapleton (1998 pounds (UK £2006)) *

Age when treated	Extra cost per patient treated	Extra life years saved per patient treated	Incremental cost - effectiveness ratio (£ per life year saved)
Under 35s	£34.15 (£41)	0.086	£397.95 (£482)
35 - 44	£34.15 (£41)	0.099	£344.68 (£418)
45 - 54	£34.15 (£41)	0.079	£432.32 (£524)
55 - 65	£43.08 (£52)	0.055	£785.43 (£952)

*Table is reproduced from Stapleton 1999, where 1998 costs have been used

The English smoking cessation service

In 2001 Godfrey *et al.* 2005 [10] (2++)investigated the cost-effectiveness of 58 English specialist smoking cessation services. Smokers were considered to have quit at four weeks if:

- They accessed a smoking cessation service and set a quit date;
- Were contactable after up to three attempts (between four and six weeks after the quit date);
- At follow-up they reported not smoking for a continuous period of two weeks;
- This was validated by exhaled carbon monoxide measurement (the reading was required to be less than 10 ppm.)

A postal survey was sent to the coordinators of the smoking cessation services in 2001 to gather information concerning the resources utilised by this service. These data were combined with data supplied by the Department of Health (DoH), to investigate, for 2001; the number of people who accessed the service and agreed a quit date; the number who received NRT / bupropion; and the number reported to have quit at four weeks. Godfrey was able to show that the mean per service:

- 12-month quit rate was 13.56% (95% CI, 12.34 - 14.49) or 11.56% (95% CI, 10.34 - 12.79) when adjusted for the background cessation rate of 2% (authors assumption);
- Life years gained were 481.9 (95% CI, 397.5 - 566.2) (the cohort size this applies to is unclear);
- Total service cost was £254,400 (95% CI, £217,100 - £291,600) (£287,521; 95% CI, £245,364 - £329,564);
- Cost per person setting a quit date was £123.4 (95% CI, £113.0 - £133.8) (£139; 95% CI, £128 - £151);

- Cost per life year gained was £684.2 (95% CI, £557.2 - £811.3) (£773; ; 95% CI, £630 - £917);
- Estimated health care cost saved was £118,700 (95% CI, £98,000 - £139,400) (£134,154; 95% CI, £110,759 - £157,549);
- Net cost per life year gained was £437.7 (95% CI, £311.2 - £564.2) (£495; 95% CI, £352 – 638) (this is the £684.2 (£729) figure adjusted for future health-care costs savings).

Based on the above findings, Godfrey concludes that, in 2001, English smoking services were cost-effective.

Stapleton 2001 [11] (2-) carried out an economic analysis to determine the cost-effectiveness of the NHS smoking cessation services for the period from April 2000 to March 2001. The analysis was based on the 126,800 smokers who made a quit attempt while attending cessation services, 48% of whom were abstinent at four weeks. The cost of the NHS smoking cessation service was £21.4m (£24m), including the start-up and monitoring costs. Excluding these costs (start-up and monitoring) the cost per patient treated was £169. The cost was raised to £209 when five to six weeks of medication (NRT/bupropion) was included. The authors show that at 12 months there was a net improvement in cessation of 17% where it was assumed that between 60% and 65% (author's assumption) of the four-week successes will have relapsed by month 12. This was calculated as follows:

- 31% (65% x 48%) of those successful at four weeks will relapse by month 12;
- Leaving a net improvement of 17% abstinent at 12 months (48-31).

To calculate the percentage of life-long quitters the authors assumed a further relapse rate of 35% (authors assumption), giving a net gain of 11% (i.e. the English smoking service will result in 11% of smokers who make a quit attempt being life-long quitters).

The resulting discounted life years saved and cost per life year saved, from the Stapleton 2001 paper, are shown in Table 4.8 and suggest that the NHS specialist smoking cessation service is highly cost-effective. The author notes that the number of quitters is likely to be an underestimate as two groups of people are ignored:

- People who were helped to a stage where they will quit on their own;
- People who attend pre-quit sessions and go on to quit without returning to the services are ignored.

Table 4.8: Life years saved and cost per life year saved (Stapleton) (2001 pounds (UK £2006))

Age	Discounted life years saved	The cost per life year saved
34 - 45	0.348	£601 (£679)
45 - 54	0.273	£766 (£866)

Health Technology Assessment comparing NRT and / or bupropion SR to advice

A Health Technology Assessment published in 2002 [12] (1++) estimated the cost-effectiveness of NRT and / or bupropion SR, compared to advice, from the perspective of the NHS. The perspective adopted was that of the NHS and data were pooled from a number of papers. The assessment concentrated on four types of interventions:

- Advice or counselling only (including GP advice and more intensive counselling by other health professionals);
- Advice plus NRT;
- Advice plus bupropion SR;
- Advice plus NRT and bupropion SR.

The results of the analysis are summarised in Table 4.9. The baseline estimates give an incremental cost per life year saved of between £1,000 and £2,399 for NRT (£1,116 and £2,677), between £639 and £1,492 for bupropion SR (£7113 and £1,665) and between £890 and £1,969 for NRT plus bupropion SR (£993 and £2,197). The baseline estimates also give an incremental cost per QALY of between £741 and £1,777 for NRT (£827 and £1,983), between £473 and £1,106 for bupropion SR (£528 and £1,234) and between £660 and £1,459 for NRT plus bupropion SR (£660 and £1,628). Although not explicitly stated in the paper 2002 has been used as the cost year.

Table 4.9: Baseline results for Woolacott (2002 pounds (UK £2006))

Standard intervention

Intervention	Cost per life time quitter	Lifetime quit rate	12-month quit rate	Cost per lifetime quitter, using brief advice only as the reference
Brief advice	£196 (£219)	0.018	0.0300	-
Brief advice plus NRT	£2,288 (£2,553)	0.033	0.0550	£4,798 (£5,353)
Brief advice plus bupropion SR	£1,799 (£2,007)	0.0423	0.0705	£2,986 (£3,331)
Brief advice plus NRT and bupropion SR	£2,683 (£2,993)	0.0536	0.0894	£3,939 (£4,395)

More intensive counselling

Intervention	Cost per life time quitter	Lifetime quit rate	12-month quit rate	Cost per lifetime quitter, using brief advice only as the reference
Brief advice	£653 (£729)	0.0540	0.0900	-
Advice plus NRT	£1,173 (£1,309)	0.0879	0.1465	£2,001 (£2,232)
Advice plus bupropion SR	£9,649 (£10,799)	0.1075	0.1792	£1,278 (£1,426)
Advice plus NRT and bupropion SR	£1,314 (£1,466)	0.1305	0.2175	£1,781 (£1,987)

4.1.2 Hospital

Three studies investigated smoking cessation services offered in a hospital environment. Two papers were researched using patients from the US and one using patients from the UK.

By comparing bedside counselling to usual care, Meenan *et al.* 1998 [13] (1+) aimed to investigate the cost-effectiveness of a smoking cessation and relapse prevention programme from the perspective of the implementing hospital. All prices are in 1999 $. The intervention consisted of a 20-minute bedside counselling session with an experienced counsellor, a 12-minute video, self-help material and one or two follow-up calls. Abstinence was classified as self reported consecutive abstinence from all tobacco use at both three and twelve months. Patients were aged 18 and older and had reported that they had regularly smoked in the three months before hospital admission. 453 patients were included in the study. At the end of one year, 9.2% of those who received usual care were abstinent and 13.5% of those who received bedside counselling. The incremental fixed and variable costs are shown in Table 4.10. The cost-effectiveness results show that:

- The incremental cost per quit was $3,697 (£2,707);
- The incremental cost per discounted life year saved ranged from $1,691 to $7,444 (£1,238 to £5,451).

The replication scenarios suggest that, with realistic implementation assumptions, the total intervention cost and the incremental cost per life year were reduced significantly. The authors conclude that brief advice is inexpensive and cost-effective.

Table 4.10: 12-month results (1999 dollars (UK £2006))

Incremental fixed costs*	Incremental variable costs*	Incremental costs
$57,999 or $128.03 per patient (453 patients were included in the study)	$14,022 (£40,268) or $30.95 (£23) per patient	$72,021 (£52,741) or $158.99 (£116) per patient
This includes: The cost of development (software, video, hotline and newsletter), counselling administrative, video equipment, hotline equipment, newsletter graphic design, tip sheet production, single session, computer time and facility space.	This includes: The labour, patient counselling, monitoring check, quit kit, manuals, hotline materials, newsletter printing and postage costs.	N/A

*in addition to usual care

Smith *et al.* 2002 [14] (2-) investigated the effectiveness of a nurse-led case-managed smoking cessation programme for general hospitalised patients in the US. During hospitalisation, the smoking cessation nurse provided:

- Bedside education to highlight the benefits of cessation;
- Behaviour modification and relapse prevention counselling with patients rating their self-efficacy to remain smoke free in a high-risk situation to enable the nurse to provide advice on how to resist smoking in high-risk situations;
- Take-home material;
- A note, placed on the patients' charts to prompt attending physicians to provide a short message advising patient to quit smoking;
- NRT was offered before discharge to patients who reported severe withdrawal symptoms or tobacco dependence.

The nurse contacted the patient by telephone after discharge (at 2, 7, 21 and 90 days post discharge), with the calls focussing on relapse prevention. The cessation rate, where patients who were not reached were designated in the model as smokers, was shown to be 61% at two days post discharge; 59% at seven days post discharge; 55% at 21 days post discharge; 43% at three months post discharge and 35% at one-year post discharge. The authors report that one nurse can provide cessation advice for two inpatients and can conduct 15 post discharge calls each day. The budget for the programme was $80,000 (£102,993) each year, and the service was provided free of change to the patient. The cost per smoker for delivery of the programme was $38.25 (£49) ($80,000/2,091). The study included patients hospitalised between September 1993 and June 1996, as the cost year for the annual budget is not provided it is assumed to be 1996. Relapse was difficult to assess as patients had trouble remembering the actual number of relapses.

Prathiba *et al*. 1998 [15] (2+) investigated whether every UK hospital should have a smoking cessation counsellor. Counselling was compared to a 'no service' scenario (physician advice only, and the data for this scenario were taken from the literature). The counselling consisted of:

- An initial meeting lasting 45-69 minutes, where a smoking history was taken and the importance of stopping smoking in relation to health benefits was explained. An expired CO test was carried out. Patients were discouraged from using NRT during the first two weeks of counselling. If, after that time, the patients wished to use NRT, relevant advice was given (patients were allowed NRT at the start of the counselling if they had a strong wish to do so);
- Four weekly sessions lasting 15-20 minutes, with an expired CO test performed;
- At three, six and twelve months, the patients were seen for a further session where an expired CO test was carried out. Further support was given;
- Post-discharge contact with the counsellor if desired;
- Between the one, three-, six-, and twelve-month appointments, the counsellor telephoned or wrote to check on the patient's progress.

The results of the cohort study show that the intervention is cost effective and that (the cost year was not reported in the study and has been taken to by 1998, the year of publication):

- The one-year cumulative probability of being a non-smoker was 21% +/-3.9% (men were more likely to succeed (29%) than women (13%));
- The 'no service' cessation rate was 5 - 10%;
- The cost of the service over the thirty months was £43,750 (salary) (£53,040) plus overheads of £2,188 (£2,653);
- Compared to 'no service' the actual cost per additional success as a result of the programme was £851 (£1,032);
- The cost per life year saved as a result of the programme was between £340 (£412) and £426 (£516);
- The sensitivity analysis (by doubling the cost of the programme and or assuming that 10% of patients stop smoking as a result of the 'no service') showed that the cost per success ranged from £1,702 (£681 - £851 per life year saved) £3,540 (£1,416 - £1,770 per life year saved) [£2,063 (£826 to £1,032 per life year saved) to £4,292 (£1,717 to £2,146)].

4.1.3 Other

Alterman *et al.* 2001 [16] (1+) carried out a study in the US (using a 1996 cost year), with the aim of comparing the effectiveness and costs of three levels of medical behavioural treatment intensity in conjunction with NRT. It is not clear as to whether intensity refers to the length of sessions as well as the number of sessions. The interventions were:

- Low intensity (LI), where NRT was given for eight weeks along with instructional video tapes and one advice and education (A&E) session with a nurse practitioner (NP);
- Moderate intensity (MI), where patients received these treatments plus three brief NP-delivered A&E sessions;
- High intensity (HI) consisted of 12 weeks' of individualised manual-driven cognitive behavioural therapy, and forgoing NRT treatments.

The authors hypothesised that an increased intensity intervention would result in greater abstinence. There were 240 participants in the study, who smoked one pack of cigarettes per day (the size of the pack was not reported). The results are shown in Table 4.11 and show that the high intervention results in greater abstinence rates at an increased cost. Where the cost of the patches dispensed was included at a weekly cost of $25 (£21). The abstinence rates found in the MI group were lower than those found by other studies of the same intervention programme, and lower than the LI group. The authors report that these are "disappointing results' and ones that are "difficult to understand".

Table 4.11: Abstinence rates and cost by the intensity of the intervention (Alterman) (1999 dollars (UK £2006))

Intervention	Abstinence rate at:			Direct treatment service costs ($)	Average costs of the nicotine patches ($)	The direct total treatment service costs, per participant
	Week 9	Week 26	Week 52			
LI	35.4% (31.9% using intention-to-treat)	29.9% (26.3% using intention-to-treat)	27.0% (26.0% using intention-to-treat)	138 (£114)	170 (£140)	$308 (£254)
MI	26.9% (23.7% using intention-to-treat)	11.6% (10.0% using intention-to-treat)	12.0% (11.3% using intention-to-treat)	174 (£144)	164 (£135)	$338 (£279)
HI	45.1% (41.6% using intention-to-treat)	36.8% (32.1% using intention-to-treat)	34.7% (33.9% using intention-to-treat)	402 (£332)	180 (£149)	$582 (£480)

4.1.4 Guidelines

The Agency for Health Care Policy Resource's (AHCPR's) *Smoking Cessation: Clinical Practice Guideline* was released in April 1996. Cromwell *et al.* 1997 [17] (1++) carried out an economic analysis to determine the cost-effectiveness of the guidelines' 15 recommendations on smoking cessation interventions (using 1995 dollars). The guidelines focused on individuals aged over 18 years of age and who were willing to make a quit attempt within the next year. The guidelines apply to either an office or hospital setting. The intention was that primary care clinicians would screen all adults for smoking status who present for a routine office visit or hospitalisation. The physicians would provide advice and motivation. Details of the interventions and associated resource utilisation assumptions are provided in Table 4.12.

Table 4.12: Resource utilisation assumptions for the interventions modelled by Cromwell*

	Intervention time (minutes)		
Counselling interventions by primary care clinicians	**Minimal counselling**	**Brief counselling**	**Full counselling**
Screening for tobacco use (registered nurse)	1	1	1
Advice to quit (physician alone)	1	1	1
Initial cessation counselling			
Physician alone	3	7	15
Physician with patch or gum	6	10	18
Follow-up counselling			
First follow-up physician visit	3-6	10	10
Second follow-up physician visit	-	-	10
Interventions by smoking cessation specialists	**Individual intensive (counselling time is distributed over five 30 minute sessions)**	**Group intensive (counselling time is distributed over seven one hour sessions)**	
Screening for tobacco use (registered nurse)	1	1	
Advice to quit (physician alone)	1	1	
Cessation counselling			
Physician	10	20	
Registered nurse	80	400	
Psychologist	60	400	

*Table is reproduced from Cromwell

The cost-effectiveness results were based on the assumption that 75% of smokers would make one quit attempt in the year. The results ranged from:

- $14.51 to $105.50 (£12 to £89) per successful participant, without any nicotine replacement;
- $246.25 to $323.73 (£207 to £272) per successful participant, with transdermal nicotine;
- $415.52 to $493.00 (£349 to £414) per successful participant, with nicotine gum.

Table 4.13 shows the cost-effectiveness ratios associated with the 15 cessation interventions detailed in the guidelines. Without NRT the cost per quitter was lowest for the intensive counselling group and highest for the minimal counselling. This pattern was also true for the cost per life year saved and the cost per quality-adjusted life year.

Table 4.13: Cost effectiveness ratios for the AHCPR's guideline interventions* (1995 dollars (UK £2006))

Intervention	Cost per quitter ($)	Cost per life year saved (QALYs discounted at 3%) ($)	Cost per quality adjusted life year (3% discount) ($)
Without NRT			
Minimal counselling	7,922 (£6,651)	5,423 (£4,553)	4,015 (£3,371)
Brief counselling	6,276 (£5,269)	4,296 (£3,607)	3,181 (£2,671)
Full counselling	2,989 (£2,510)	2,046 (£1,718)	1,515 (£1,272)
Individual intensive counselling	3,595 (£3,018)	2,461 (£2,066)	1,822 (£1,530)
Group intensive counselling	2,186 (£1,835)	1,496 (£1,256)	1,108 (£930)
With transdermal nicotine			
Minimal counselling	4,745 (£3,984)	3,248 (£2,727)	2,405 (£2,019)
Brief counselling	4,184 (£3,513)	2,864 (£2,405)	2,120 (£1,780)
Full counselling	2,715 (£2,279)	1,859 (£1,561)	1,376 (£1,155)
Individual intensive counselling	2,871 (£2,410)	1,969 (£1,653)	1,455 (£1,222)
Group intensive counselling	2,310 (£1,939)	1,581 (£1,327)	1,171 (£983)
With nicotine gum			
Minimal counselling	8,962 (£7,524)	6,135 (£5,151)	4,542 (£3,813)
Brief counselling	7,350 (£6,171)	5,031 (£4,224)	3,725 (£3,127)
Full counselling	4,237 (£3,557)	2,900 (£2,435)	2,147 (£1,803)
Individual intensive counselling	4,407 (£3,700)	3,016 (£2,532)	2,233 (£1,875)
Group intensive counselling	3,596 (£3,019)	2,461 (£2,066)	1,822 (£1,530)

*Table is reproduced from Cromwell *et al.* 1997 and all costs are reported in 1995$.

Full implementation of the guidelines would cost $6.3 billion a year (£5 billion), with society gaining 1.7 million new quitters at an average cost of $3,779 (£3,173) per quitter, $2,587 (£2,172) per life year gained and $1,915 (£1,608) per QALY gained. The more intensive interventions are the more cost-effective but only 5% of smokers will be willing to participate in this intervention (the expert opinion of the guideline panel was that 40% of smokers would choose brief counselling, 30% would choose full, 25% would choose minimal, and 5% would choose intensive (2.5% would choose individual and 2.5% would choose group)).

4.2 SUB QUESTIONS

4.2.1 Does cost-effectiveness vary by gender, age, level of addiction, previous quit attempts, history of quitting or ethnicity?

Age and gender

Cummings *et al.* 1989 [4] (1+) carried out an economic analysis using a hypothetical cohort of patients to determine the cost-effectiveness of physician counselling to quit smoking during a routing office visit. The cost per life year saved varies by age and gender, as shown in Table 4.14. The cost per life year saved was generally higher for women. The authors comment that this is likely to be due to the fact that men are generally heavier smokers and therefore gain more from quitting. The lowest cost per life year saved was for men aged 50 - 54 and women aged 55 - 59.

Table 4.14: Cost per life year saved by age and gender* (1984 pounds (UK £2006))

Age	Men ($)	Women ($)
35 - 39	988 (£1,655)	2,058 (£3,447)
40 - 44	837 (£1,402)	1,646 (£2,757)
45 - 49	748 (£1,253)	1,372 (£2,298)
50 - 54	705 (£1,181)	1,235 (£2,068)
55 - 59	726 (£1,216)	1,204 (£2,017)
60 - 64	810 (£1,357)	1,266 (£2,120)
65 - 69	950 (£1,591)	1,411 (£2,363)

*Table adapted from Cummings

Stapleton 1999 [9] (1+) estimated the cost-effectiveness for the UK NHS allowing GPs to prescribe nicotine patches for up to 12 weeks. He showed that the intervention, where NRT patches plus GP counselling was compared to placebo patches plus GP counselling, was marginally more effective for those aged 35 - 44 years, see Table 4.7. Wasley *et al.* [5] (1++) investigated NRT and brief physician advice (see Table 4.6 for the results by gender and age). The data indicate that men aged between 45 and 49 and women aged between 50 and 54 will receive the optimal benefit from either therapy.

Gender

Prathiba *et al.* 1998 [15] (2+) in their investigation of hospital smoking counsellors showed that the one-year cumulative probability of being a non-smoker was 21+/-3.9% and that men (29%) were more likely to succeed than women (13%).

4.2.2 What is the cost-effectiveness of stop smoking interventions for pregnant women?

Buchanan 2002 [18] (2-), reported the results of a small pilot study analysing the effects of a smoking cessation programme for 20 pregnant women. The study aimed to demonstrate how the clinical practice guidelines (CPG) from the US Department of Health and Human Services were utilised by conducting a pilot programme of pregnant women. The setting was a health maintenance organisation managed care (HMO) system. The pilot programme selected 20 pregnant smokers who were willing to quit within the next two weeks, further details were not provided. These women were followed up until two weeks after delivery. The comparator group selected 28 women from a pool of 400 women in the HMO who had participated in a post-delivery telephone survey and had a history of smoking during pregnancy. Details of the participants in both groups are provided in Table 4.15.

Table 4.15: Participants in the Buchanan study

Group	Mean age	Average cigarettes smoked before pregnancy	Average cigarettes at the first prenatal visit	Average cigarettes at the programme entry
Pilot study	25.2 years (range 22 - 31)	20	10.8	9.9
Comparator	28.8 years	18	6.7	N/A

The pilot programme entailed:

- Nine proactive calls which took place at intervals between one week before the quit date and two weeks after delivery. During the calls a quit plan was discussed, support was given, the mothers were monitored and how to handle relapse was discussed;
- An educational booklet was provided to all participants;
- Counselling and education interventions concerning nicotine fading, relaxation and social support were also provided.

Table 4.16 shows the smoking rates resulting from the pilot study.

Table 4.16: Smoking rates throughout the study

Group	At the prenatal visits	At delivery	Two weeks after delivery
Pilot study	100%	10%	20%
Comparator	82%	32%	39%

The programme was estimated to cost about $150 per participant (£101, using 1999 as a proxy of the cost year) (this included approximately five hours' nursing time, long distance calls, postage and educational materials). The results show a trend towards increased

relapse at delivery and two weeks after delivery for both groups. The authors note that many tobacco users cycle though quitting and relapse many times.

Severson *et al.* 1997 [29] (1+) aimed to investigate the effects of counselling new mothers about their smoking and the detrimental effects of environmental tobacco smoke (ETS) on infant health in the US. Mothers self reported their smoking status by reporting whether they had 'not smoked at all, not even a puff', for the seven days before assessment. An RCT was carried out, where randomisation was practice-based (23 practices delivered the minimal intervention and 26 delivered the extended intervention). Mothers were randomised to either:

- Minimal intervention:
  - Which began at the paediatrician's hospital visit after delivery;
  - All mothers (smokers and non-smokers) received material containing a brochure, a letter to the mother signed by the paediatrician and a nursery sign;
  - The materials were designed to alert the mother to reduce the baby's exposure to smoke.
- Extended intervention:
  - Contained the same material as the minimal intervention plus intervention at the first four well baby visits (two and three weeks, and two, four and six months after birth);
  - Mothers were categorised as smokers or quitters (i.e. not currently smoking but having smoked in the month prior to pregnancy);
  - Brief advice and encouragement were given at each visit, accompanied by specifically developed written material. During one of the visits a specially developed video was shown.

The mothers in the extended intervention who completed both the six- and twelve-month assessments were older, better educated and less likely to have husbands/partners who smoked. All other characteristics were the same between the two groups. The study enrolled 2,901 mothers of newborns and most analysis is presented for 2,003 (69.0%) of the mothers enrolled in the study. The twelve-month quit rate is shown in Table 4.17. For example, the table shoes that mothers who quit smoking for pregnancy and received the extended intervention were significantly more likely to maintain their cessation throughout the 12 month period (32.8%) than those who received the minimal intervention (26.1%).

Table 4.17: Twelve-month and continuous quit rate*

	Minimal (%)	Extended (%)	Chi squared
Continuous quit			
Quitters at enrolment	26.1	32.8	5.28**
Smokers at enrolment	1.2	2.3	2.94**
12-month quit rate			
Quitters at enrolment	39.1	42.9	1.45
Smokers at enrolment	4.7	5.5	0.54

*Table adapted from Severson *et al.* 1997
**p<0.05

The cost of the intervention included training, staff time for assessment and advice and counselling and materials. The authors estimated that, for a practice with up to four paediatricians and six office staff:

- One time costs should be under $500 (£366, the cost year is unclear and the publication year, 2002 has been used as a proxy);
- Staff costs to determine and record smoking status would be between 20 and 75 (15 and 55 pence) cents per mother;
- Intervention costs (professional time, staff time and written materials) would total $10 to $15 (£7 to £11) per mother over four visits, with up to $10 (£7) more for mothers who smoke and need cessation assistance.

Mothers who continue to smoke and received the extended interventions: were more ready to quit smoking; had a greater likelihood of tying to quit smoking; had a negative attitude towards smoking and; had an increased knowledge of the dangers of passive smoking. The best predictor of whether a mother would quit smoking at six and twelve months was whether she allowed smoking in the home and whether her partner smoked. The authors reported that, whilst not possible to gather cost data for this study, costs would include training, time involved for the staff to give the counselling and materials.

4.2.3 What is the cost-effectiveness of stop smoking interventions for routine and manual workers?

The papers identified for this review did not separate the analyses into routine and manual workers.

Section 5: Overview and Discussion

5.1 OVERVIEW AND DISCUSSION

Overall there was limited information concerning the cost-effectiveness of NHS interventions aimed at smoking cessation. A total of 18 papers were included in the review. The interventions focussed of physician-delivered interventions, interventions delivered in a hospital setting, other interventions and guidelines. All interventions were shown to be relatively cost-effective.

Physician-delivered advice was broken down into the following areas:

- Stage of change and physician advice:
  - Although the majority of evidence is of a high quality (two 1+ studies and one 2++) there is little evidence to support its use;
  - A UK study (1+) where GPs delivered either motivational advice or brief advice showed that the marginal cost per quitter was low at £451 [1]. This study was among the only two randomised controlled trials (RCTs), with economic evidence, included in the systematic review carried out by Riemsma *et al.* 2003 [2] (1+);
  - The third study was a cohort analysis (2++) showing that assessing an individual's stage of change and directing interventions accordingly was cost-effective [3].
- Advice given during routine physician visit:
  - This review found three studies that report the cost-effectiveness of physician advice offered during a routine visit (two 1++ studies and 1+ study);
  - A Cochrane review [6] published in 2005 found that there was not enough evidence to evaluate whether group interventions are more cost-effective than individual counselling sessions;
  - Two of the papers reviewed are old and the results may unreliable [4; 5];
  - Leaving the older studies out of the review provides a high quality economic analysis (1++) [7]. Although carried out in the Netherlands, these results have the potential to be applicable to the UK. The author's show that all five interventions investigated (minimal counselling; minimal GP counselling and nicotine patches; intensive counselling by a trained counsellor; intensive counselling by a trained lung nurse plus two minutes stop advice from a lung specialist, and bupropion; and telephone counselling) were cost-effective compared to current practice (the interventions ranged from minimal counselling to counselling plus nicotine replacement therapy (NRT) to telephone counselling).

- More intensive smoking cessation advice:
  - One 1++ study and one 1+ study were reviewed;
  - One study investigated sending letters concerning smoking cessation and found that non-tailored letter increased cessation rates in a large general practice. Tailored letters were not as effective as non-tailored letters but did promote a shift towards cessation [8].
  - The second paper looked at NRT with general practitioner (GP) counselling [9] and showed that the interventions were cost-effective for all ages treated. This study was published in 1999 and the results may no longer be relevant.
- The English smoking cessation service:
  - Two studies reviewed the cost-effectiveness of the English smoking service in 2001 (2++ and 2-). Although both were cohort analyses they do help to show that the service was cost-effective. The cost per life year saved ranged from £601 to £766 for all ages [10; 11].
- A health technology report (1++) [12] carried out in 2002 estimated the cost-effectiveness of NRT and / or bupropion sustained release (SR) compared to advice only and the results show that both interventions are cost-effective when compared to advice alone.

Three studies investigated smoking cessation offered in a hospital environment; two papers were carried out in the US and one in the UK. The quality of these papers was low (one 1+, one 2- and one 2+ study) and the results should be viewed with caution. The 1+ study compared bedside counselling to usual care and concluded that brief advice was inexpensive and cost-effective [13]. The other two cohort studies showed that a nurse case managed smoking cessation programme in a hospital was inexpensive and resulted in a reduction in smoking. A hospital smoking cessation counsellor would result in a cost per life year saved of between £340 and £426 [14; 15].

There is some evidence to suggest that high intensity interventions are more cost-effective than low intensity interventions (one 1+ study) [16]. Smoking cessation guidelines have been shown to be cost effective in the US (1+) [17].

The cost-effectiveness of NHS smoking cessation services varies by age and gender. The cost-effectiveness of physician-delivered counselling during a routine office visit appears to be greatest for men aged 50-54 and women aged 55-59 (1+) [4], although this paper is rather dated. It was suggested that men aged between 40-49 and women aged between 50-54 will receive the greatest benefit from allowing GPs to prescribe nicotine patches (1++) [9].

A pilot study aimed at pregnant women (2-) [18] showed that proactive calls and counselling resulted in a trend towards smoking cessation. Counselling new mothers about the effect that smoke has on their babies was shown to be effective for both minimal and extended interventions. The authors reported that, whilst it was not possible to gather cost data for this study, costs would include: training, time involved for the staff to give the counselling and materials.

Section 6: Evidence Tables

6.1 EVIDENCE TABLES

Evidence of Cost-Effectiveness									
First author **Year** **Country**	**Study design**	**Research Type**	**Research Quality**	**Study Population**	**Research design and question**	**Length of follow-up**	**Main results**	**Application to the UK population and settings**	**Confounders / comments**
Alterman AI, Gariti P, Mulvaney F. 2001 US	RCT	1	+	240 one pack a day smokers.	Aim: To compare the efficacy and costs of three levels of medical behavioural treatment intensity in conjunction with NRT. Intervention and control: Three interventions were: 1) Low intensity (LI), NRT given for eight weeks with instructional video tapes and one advice and education (A&E) session with a nurse practitioner (NP); 2) Moderate intensity (MI), received these treatments plus three brief NP-delivered A&E sessions; 3) High intensity (HI), consisted of foregoing treatments plus 12 weeks of individualised, manual driven cognitive behavioural therapy.	One-year.	The abstinence rates at week 9; were LI = 35.4% (31.9% using intention-to-treat (INT)); MI = 26.9% (23.7% INT) and HI = 45.1% (41.6% INT). The abstinence rates at week 26; were LI = 29.9% (26.3% INT); MI = 11.6% (10.0% INT) and HI = 36.8% (32.1% INT). The abstinence rates at week 52; were LI= 27.0% (26.0% INT) in the LI group; MI = 12.0% (11o.3% INT) and HI = 34.7% (33.9% INT). The direct treatment service costs were $138 for the LI group, the cost of nicotine patches was $170, giving a total cost of $308. The direct treatment service costs were $174 for the MI group, the cost of services plus patches was $338. The direct treatment service costs were $402 for the HI group, the cost of services plus patches was $582. All costs are per participant.	This study was carried out in the US but may be applicable to the UK.	None.

Buchanan L. 2002 US	Pilot of a non RCT.	2	-	The mean age of the 20 mothers included in the pilot study was 25.2 years (range 22-31) and in the comparison was 28.8 years.	Aim: Demonstrate how the clinical practice guidelines (CPG) from the US Department of Health and Human Services were utilised. Pregnant women who were willing to quit within the next two weeks were identified and referred to a pilot programme. Further details were not provided. The setting was a health maintenance organization managed care system. Intervention: The pilot programme entailed: 1) Nine proactive calls which took place at intervals from one week before the quit date to two weeks after delivery. During the calls a quit plan was discussed, support was given, the mothers were monitored and how to handle relapse was discussed; 2) An educational booklet was provided; 3) Counselling and education interventions concerning nicotine fading, relaxation and social support were also provided. 20 women were identified. Control: Participants in the comparator group were identified from a pool of 400 women in the HMO who participated on a post-delivery telephone survey and had a history of smoking during pregnancy. 28 women were identified.	Participants in the pilot study were followed up until two weeks after delivery.	At the prenatal visits all the pilot participants reported smoking compared to 82% of the comparison. At delivery 10% of the pilot participants reported smoking compared to 32% of the comparison group. Two weeks after delivery 20% of the pilot participants and 39% of the comparison group reported smoking. The programme was estimated to cost about $150 per participant (this included approximately five hours of nursing time, long distant calls, postage and educational materials).	Although not a UK study, it is applicable to the UK.	The results show a trend towards increased relapse at delivery and at two weeks after delivery for both groups. The authors note that many tobacco users cycle though quitting and relapse many times.

Buck DJ, Richmond RL, Mendelsohn CP. 2000 Australia	Cohort analysis.	2	++	2092 smokers, of which 728 were followed up.	Aim: Assess the cost-effectiveness of a smoking cessation programme delivered by physicians. Intervention: Physicians were trained to asses the stage of their smoking patients (i.e. 'not ready', 'not sure', 'ready'). All smokers were given a booklet relevant to their stage. Those 'not ready' were invited to return when they were ready; those 'not sure' were given a motivational interview. Those ready to give up received a programme of three visits of cogitative behavioural strategies and advice on how to use nicotine chewing gum. Control: None.	Unclear.	At 12 months 22%, of the smokers followed up, were abstinent (this was 21% after applying a validation rate of 5%, and reduced further to 13% to take account of natural abstinence). The cost-effectiveness analysis used an estimate to 261 smokers who are abstinent after the Smoke screen intervention. The total cost to the organiser was $30,927, to the physician was $72,810, to pre-contemplative smokers was $655, to contemplative smokers was $1,646 and to prepared smokers was $23,429. Including training costs the cost per additional quitter from the perspective of the organiser was $118 (CI: $106-134), the physician was $279 (CI: $249-317), the smoker $99 (CI: $88-112), all parties $496 (CI: 443-563). Excluding training costs the cost per additional quitter from the perspective of the organiser was $0, the physician was $183 (CI: $164-208), the smoker $99 (CI: $88-112), all parties $281 (CI: 252-320).	This study was not carried out in the UK and may not be applicable to the NHS.	None.

Butler CC, Rollnick S, Cohen D, Bachmann M, Russell I. 1999 UK	RCT.	1	+	70.7% of the participants in the brief advice group were female; versus 70.4% in the motivational consulting group. The mean age was 41.35 in the brief advice group; versus 41.44 in the motivational consulting group. The groups were similar at baseline.	Aim: Compare the clinical and cost-effectiveness of motivational consulting with brief advice to quit smoking. Intervention and control: Motivational consulting (MC) was compared to brief advice (BA), the GP provided both interventions: 1) Motivational consulting - phase 1, patients numerically rated their motivation and confidence to quit smoking; phase 2 based on the scores clinicians used specific questions and strategies. The aim was to build motivation and confidence by encouraging patients to identify arguments for change or practical attainable steps for quitting. Phase 3 involved inviting patients to set meaningful targets. 2) Brief advice consisted of a set of statements physicians gave to smokers, concerning the dangers of smoking.	Six months.	At six months follow-up 1.5% of the BA group had self reported abstention in the previous month versus 3% in the MC group; and 3% of the BA group had self reported abstention in the previous 24-hours versus 8.1% in the MC group; The costs of the interventions were as follows; 1) MC took a mean of 9.96 minutes versus two minutes for BA (or £13.59 extra per consultation; 2) The cost of the training the GPs, was £2,111.40 (16 hours of trainer time, 74 hours of trainee time). This was £2,571.47 or £69.50 per clinician when the opportunity cost of the training time and travel costs are included; 3) Cost of training clinicians for each smoker who received MC was £9.52. The clinicians only needed to be trained once and as MC becomes routine the costs will be reduced to the extra consulting time. The actual costs incurred in this study were £23.11 over that for brief advice. The marginal cost per quitter was £450.56 (£265 using the extra consulting time cost only). The marginal cost per reduction in addiction was £279.63 (£164.44 without training costs). Marginal cost per quit attempt was £311.99 (£183.47 without training costs).	Yes (UK study).	None.
Cromwell J, Bartosch WJ, Fiore MC, Hasselblad V, Baker T. 1997 US	Economic analysis, where the effectiveness data is drawn from meta analysis.	1	++	The guideline focused on individuals (over 18 years, who were willing to make a quit attempt in the next year) in the office and in the hospital. Primary care clinicians screen	Aim: Determine the relative cost-effectiveness of the Agency for Health Care Policy Resource's (AHCPR's) Smoking Cessation: Clinical Practice Guideline. Intervention and control: Three counselling interventions by primary care clinicians (one	Unclear.	The cost per participant of the intervention ranged between: 1) $14.51 to $105.50 per successful participant, without any nicotine replacement; 2) $246.25 to $323.73 per successful participant, with transdermal nicotine; 3) $2415.52 to $493.00 per successful participant, with nicotine gum. Without nicotine replacement the cost per quitter ranged from $2186	Yes.	Overall the guidelines would result in $3779 per quitter, $2587 per life year saved, and £1915 per QALY saved. It is the expert

				all adults, who present at for a routing office visit or hospitalisation, for smoking status. They provided advice and motivation. Further details were not provided.	minimal, one brief and one full) and two counselling interventions by smoking cessation specialists (one on an individual basis and one on a group basis). All interventions were modelled with and without transdermal nicotine and nicotine gum. The physician based interventions involved 15 minutes for an initial visit and two 10 minute follow ups. The use of nicotine replacements increased the time by three minutes. The specialists interventions involved five counselling sessions for the individual intervention (each 30 minutes - the first involved 10 minutes of the physicians time), and 7 sessions for groups of 10 people for the group intervention (each one hour long again with physician available during the first). Cost-effectiveness results are based on the assumption that 75% of smokers would make one quit attempt in the year.		for the group counselling to $7922 for the minimal physician counselling; and the cost per QALY (3% discount rate) ranged from $1108 for group counselling to $4015 the minimal physician counselling. With transdermal nicotine cost per quitter ranged from $2310 for the group counselling to $4745 for the minimal physician counselling; and the cost per QALY ranged from $1171 for group counselling to $2405 the minimal physician counselling. With nicotine gum cost per quitter ranged from $3596 for the group counselling to $8962 for the minimal physician counselling; and the cost per QALY ranged from $1822 for group counselling to $4542 the minimal physician counselling.		opinion of the guideline panel that :40% of smokers would choose brief counselling, 30% would choose full, 25% would choose minimal, and 5% would choose intensive (2.5% would choose individual and 2.5% would choose group).

Cummings SR, Rubin SM, Oster G. 1989 US	Economic analysis, where the effectiveness data is drawn from RCTs.	1	+	A hypothetical cohort of patients who are smokers and are seen during a routine office visit. All patients were counselled.	Aim: To analyse the cost-effectiveness of physician counselling to quit smoking during a routing office visit. A societal perspective was adopted. Intervention: A four minute brief advice was offered during a routine office visit plus a self help booklet. The one-year cessation rate from brief advice, taken from previous studies, was 2.7%. The authors assumed that 10% of patients who had abstained for one year would eventually relapse and that they would gain none of the health benefits of smoking cessation. Control: None.	One-year.	The intervention cost $17 per patient. Brief advice and counselling cost from $705 (aged 50-54) to $988 (aged 35-39) for men per life saved; and from $1204 (aged 55-59) to $2058 (aged 35-39) for women depending on the patients age. The incremental cost-effectiveness of a follow-up visit about smoking cessation ranged from $421(assuming a 12% increase in cessation rate) to $5051 (assuming a 1% increase in cessation rate) for men; and from $772 (assuming a 12% increase in cessation rate) to $9,259 (assuming a 1% increase in cessation rate) for women. A pessimistic assumption of a cost of $45, a 1% point gain in smoking cessation and a 50% relapse rate, gives costs per year of life saved from $12,857 to $18,000 for men and $21,951 to $37,500 for women.	This study was carried out in the US and was published in 1989; it is therefore unlikely to be relevant to the UK.	The authors note that the assumption that only 2.7% of smokers would quit is low (4-10% is normally used) and they may have overestimated the costs of the brief advice.
Feenstra TL, Hamberg-van Reenen HH, Hoogenveen RT, Rutten-van Molken MP. 2005 Netherlands	Economic analysis.	1	++	The Dutch population.	Aim: Determine the cost-effectiveness of five face-to-face smoking interventions. Intervention: The following were compared to current practice: 1) Counselling, lasting 12 minutes, provided by a GP; 2) Minimal GP counselling and nicotine patches or gum for eight weeks; 3) Intensive counselling by a trained counsellor, lasting 90 minutes plus two minutes stop advice from a lung physician, and NRT for twelve weeks; 4) Intensive counselling by a trained lung nurse plus two	One of the five interventions was implemented for 1, 10 or 75 years.	The cost per quitter of each intervention was as follows, 1) 450 Euros; 2) 1750 Euros; 3) 2970 Euros; 4) 2410 Euros and 5) 1640 Euros. Compared to current practice the minimal GP counselling was a dominant intervention, generating both gains in QALYS and life-years, with lower costs. The incremental cost per QALY gained of the other interventions ranged from 1100 Euros for the telephone counselling to 4900 Euros for the intensive counselling with nicotine patches or gum for implementation periods of 75 years.	The study was carried out in the Netherlands and is unlikely to be applicable to the UK.	None.

					minutes stop advice from a lung specialist, and bupropion for nine weeks; 5) Telephone counselling, consisting of one 30 minute call and six follow up calls of 15 minutes each.				
Godfrey C, Parrott S, Coleman T, Pound E. 2005 Uk	Question naire sent to GPs, not a RCT.	2	++	Individuals who accessed the NHS smoking cessation service.	Aim and intervention: To investigate the cost-effectiveness of English specialist smoking cessation services. Smokers were considered to have quit at four weeks if; they accessed a smoking cessation service and set a quit date; they were contactable after up to three attempts (between four and six weeks after the quit date); at follow-up they reported not smoking for a continuous period of two weeks. This was validated by exhaled carbon monoxide measurement (the reading needed to be less than 10 ppm).	One-year.	The 12 month quit rate was 13.56% (95% CI, 12.34 - 14.49). This is 11.56% (95% CI, 10.34 - 12.79) when adjusted for the background cessation rate of 2%. The life's years gained were 481.9 (95% CI, 397.5-566.2). The total service cost was £254,400 ((95% CI, 217,100-291,600). The cost per person setting a quit date was £123.4 (95% CI, 113.0-133.8); the cost per life year gained was £684.2 (95% CI, 557.2-811.3); the estimated health care cost saved was £118,700 (95% CI, 98,000-139,400); and the net cost per life year gained was £437.7 (95% CI, 311.2-564.2).	Yes (UK study).	None.

Meenan RT, Stevens VJ, Hornbrook MC, La Chance PA, Glasgow RE, Hollis JF, Lichtenstein E, Vogt TM. 1998 US	RCT. Economic analysis.	1	+	Patients were aged 18 and older who had reported that they had regularly smoked in the three months before hospital admission. Patient were excluded if they were admitted for less than 36 hours, hospice patients, postpartum patients and those admitted for substance abuse.	Aim: Assess the cost-effectiveness of a smoking cessation and relapse prevention programme delivered in hospitals. The perspective was that of the implementing hospital. Intervention: A 20 minute bedside counselling session with an experienced counsellor, a 12 minute video, self help material, and one to two follow up calls. Abstinence was classified as self report of consecutive abstinence from all tobacco used at both three and twelve months. Control: Usual care.	Three and twelve months.	At the end of the study 9.2% of usual care and 13.5% of the intervention subjects were abstinent (p=0.023). The fixed costs included in the analysis were the cost of development (software, video, hotline and newsletter), counselling administrative, video equipment, hotline equipment, newsletter graphic design, tip sheet production, single session, computer time and facility space. The total fixed costs were $57,999 or $128.03 per patient. The variable costs included, labour, patient counselling, monitoring check, quit kit, manuals, hotline materials, newsletter printing and postage. The total variable costs were $14,022 or $30.95 per patient. The incremental costs were $72,021 or $158.99 per patient. The incremental cost per incremental quit was $3,697. Incremental cost per incremental discounted life year saved ranged form $1,691 to $7,444. The replication scenarios suggest that with realistic implementation assumptions the total interventions cost and the incremental cost per incremental discounted life year be reduced significantly. All costs were in 1999 $.	This study was not carried out in the UK and may not be applicable to the NHS.	None.

Prathiba BV, Tjeder S, Phillips C, Campbell IA. 1998 UK	Cohort analysis. A 'no service' scenario is used as the comparator (data is taken from the literature).	2	+	1,155 patients were referred for counselling. Patients were in-patients and out-patients at a UK teaching hospital.	Aim: Determine the smoking cessation rate for hospital patients who received a structured programme of advice and support. The cost-effectiveness of the intervention was also determined. An expired carbon monoxide (CO) test was carried out throughout follow up. Intervention: Counselling consisting of: 1) An initial 45-69 minute meeting, where a smoking history was taken and the importance of stopping smoking in relation to health benefits was explained. Patients are discouraged from using NRT during the first two weeks of counselling; 2) Four weekly 15-20 minute sessions; 3) At three, six and twelve months the patients were seen for a further session, were further support was provided; 4) Post-discharge contact with the counsellor was permitted; 5) Between the one, three, six, and twelve months appointments the counsellor telephoned or wrote to check on progress. Control: Physicians advice only.	One-year.	At one year the cumulative probability of being a non-smoker 21+/-3.9%. Men were more likely to succeed (29%) than women (13%). The 'no service' cessation rate was 5-10%. The authors have assumed that if patients received 'no service' 86 (7.5% of the 1,155) patients would have been successful. Of the 663 patients who undertook the programme 140 were classified as successful at 12 months (54 more successes compared to the comparator). The cost of the service over the thirty months was £43,750 (salary) plus overheads at £2,188. Compared to 'no service' the actual cost per additional success as a result of the programme was £851. Using estimates on life-years saved the cost per life-year saved as a result of the programme was between £340 and £426. Sensitivity analysis shows the cost per success ranges from ££1,702 (£681-£851 per life year saved) to £3,540 (£1,416-£1,770 per life year saved); by doubling the cost of the programme and or assuming that 10% of patients stop smoking as a result of the 'no service'.	Yes (UK study).	None.

Riemsma RP, Pattenden J, Bridle C, Sowden AJ, Mather L, Watt IS, Walker A. 2003 UK	Systematic review, including RCTs.	1	+	This is a review of papers.	Aim: Investigate the effectiveness of interventions that use a stage based approach to smoking cessation. Intervention and control: Stage based smoking cessation interventions aim to identify an individuals readiness to change so that that the relevant process can be applied. Stage interventions are assessed regularly and changes in the individual's readiness to change are reflected in the intervention. The elements of the intervention are repeated until the individual stops smoking.	-	Two trials were identified that looked at the cost-effectiveness of the intervention: Butler et al 1999 evaluated motivational consulting delivered by a general practitioner. They found that the marginal cost per person who quitted was £450.65, with increased use this could fall to £265. Sinclair et al 1999 studied pharmacists who gave tailored advice on smoking cessation. The incremental cost-effectiveness ratio was £300 per person who quit.	Unclear.	None.

Scott Lennox A, Osman LM, Reiter E, Robertson R, Friend J, McCann I, Scatun D, Donnan PT 2001 UK	RCT	1	+	2553 smokers aged 17 to 65, from six general practices in Aberdeen Scotland.	Aim: Develop and evaluate a computerised system for generating tailored letters about smoking cessation, in a primary care setting. Intervention: Participants were sent a questionnaire asking them about their current smoking behaviour, attitudes to smoking, barriers to quitting and intention to quit in the next six months. Once questionnaires were received participants was either sent a tailored letter, a non tailed letter or no letter. The tailored and non tailored letter included sections on the desire to quit; motivation; confidence building; and advice on stopping. The tailored letters were tailed according to the information the participants provided in the initial study. The control group (no letter group) received a letter thanking them for their participation and letting them know that they would receive information at the end of the study, for example a tailored or non-tailored letter. Control: No letter.	Six months.	Cessation rates at six months were 3.5% (95% CI, 2.3-4.7) for the tailored group; 4.4% (95% CI, 3.0-5.8) and 2.6% (95% CI, 1.5-3.7) for the no letter group. The cessation was 66% greater in the non-tailored compared to the tailored group. For participants who smoked <20 cigarettes per day the non tailored cessation rate was 87% greater that the no letter group. For heavy smokers who did not quit, a 76% higher rate of positive shift in 'stage of change' (the intention to quit in a particular time period) was observed compared to those who did not receive a letter. The increase in cost for each additional quitter in the non-tailored letter group compared with the no letter group was £89.	Yes (UK study).	The non tailored letter increased cessation rates in a large general practice. The tailored letter was not effective but did promote a shift towards cessation.

Severson HH, Andrews JA, Lichtenstein E, Wall M, Akers L. 1997 US	RCT	1	+	2,901 mothers of newborns were enrolled.	Aim: Investigate the effects of counselling new mothers about their smoking habits and the deleterious effects of environmental tobacco smoke (ETS) on infant health. Mothers self reported their smoking status by reporting if they had not smoked at all for the seven days before assessment. Intervention: Minimal intervention compared to extended intervention. Minimal intervention began at the paediatricians hospital visit after delivery and was provided to all mothers. The materials were designed to alert the mother to dangers of ETS. Extended intervention contained the same material as the minimal intervention plus intervention at the first four well baby visits (two and three weeks, and two, four and six months after birth). Mothers were categorised as smokers or quitters (not currently smoking but having smoked in the month prior to pregnancy). Brief advice and encouragement were given at each visit, accompanied by specifically developed written material. During one of the visits a specially developed video was shown.	A questionnaire was sent out at a six and twelve months.	The quit rate was 42.9%, at twelve months, for mothers who quit for pregnancy and received the extended intervention (32.8% continuous quit rate); and 39.1%, at twelve months, for mothers who received the minimal intervention (26.1% continuous quit rate); The quit rate was 5.5%, at twelve months, for mothers who smoked during pregnancy and received the extended intervention (2.3% continuous quit rate); and 4.7%, at twelve months, for mothers who received the minimal intervention (1.2% continuous quit rate); The cost of the intervention included training, staff time for assessment and advice and counselling and materials. The authors estimated that for a practice with up to four paediatricians the cost should be under $500.	This study was carried out in the US and may not be applicable to the UK.	The effects on mothers who continued to smoke and who received the extended interventions were: they were more ready to quit smoking; had a greater likelihood of tying to quit smoking; had a negative attitude towards smoking; and had an increased knowledge of the dangers of passive smoking. The best predictor of whether a mother would quit smoking at six and twelve months was whether she allowed smoking in the home and whether her partner smoked.

Smith P, Reilly, K, Houston N, DeBusk R, Taylor C. 2002 US	Cohort analysis.	2	-	There were 814 participants and 221 dropouts. The mean age of the participants was 52+/-13; there were 57% males. The mean age of the dropouts was 48+/-15; there were 60% males.	Aim: Investigate the effectiveness of a nurse case-managed smoking cessation programme for general hospitalised patients that were continued three years after clinical trials were completed. Intervention: During hospitalisation a smoking cessation nurse provided bedside education (where the benefits of cessation were provided), behaviour modification and relapse prevention counselling (where patients rated their self-efficacy to remain smoke free in high risk situation to enable the nurse to provide advice on how to resist smoking). Take home material was provided and a note was placed on the patients charts to prompt attending physicians to provide a short message advising patients to quit smoking. NRT was offered before discharge to patients who reported severe withdrawal symptoms or tobacco dependence. The nurse contacted the patient by telephone after discharge at 2,7,21 and 90 days post discharge. The calls focussed on relapse prevention.	One-year.	Patients who were not reached at the one-year follow up were counted as smokers, giving a cessation rate of: 61% at two days post discharge; 59% at seven days post discharge; 55% at 21 days post discharge; 43% at three months post discharge and 35% at one year post discharge. The authors report that one nurse could provide cessation advice for two in-patients and could conduct 15 post discharged calls, each day. The budget for the programme was $80,000 each year, and was provided free of change to the patient, giving an annual per patient cost of $38.26 (i.e. divide the budget 2,091 - the number of patients who were identified in the study and who would have incurred a cost whether they participated in the study or not).	This study was carried out in the US and may not be applicable to the UK.	Relapse is difficult to assess as patients had trouble remembering the actual number of relapses.

Stapleton J 2001 UK	Economic analysis.	2	-	The 126,800 smokers who made a quit attempt while attending cessation services.	Aim: Determine the cost-effectiveness of the NHS smoking cessation services.	Not provided.	The NHS smoking cessation service cost £21.4 m, including start-up and monitoring costs. Without these costs the cost per patient treated was £169. Including five to six weeks of medication (NRT/bupropion) the cost was £209. 48% of the smokers were abstinent at four weeks. If it is assumed that 60-65% of the four week successes relapsed by 12 months, the net improvement in cessation at 12 months was 17%. Taking into account the relapse rate (35% after 12 months) left a net gain of 11% for life-long quitters. The resulting discounted life years saved was 0.348 for 34-45 year olds treated and 0.273 for 45-54 years olds treated. The cost per life year saved was £601 for 35-45 year olds and £766 for 45-54 year olds.	Yes (UK study).	The number of quitters is likely to be an underestimate as people who were helped to a stage where they will quit on their own and people who attend pre-quit sessions then quit without returning to the services are ignored.

Stapleton JA, Lowin A, Russell MAH. 1999 UK	RCT Economic analysis.	1	++	Not provided.	Aim: Estimate the cost-effectiveness for the NHS of allowing GPs to prescribe nicotine patches for up to 12 weeks. Intervention: 1200 patients were randomly assigned nicotine patches or placebo patches. Patients also received brief counselling and a booklet on how to stop. Participants met with a GP or nurse at weeks 0, 1, 3, 6, 12, 26 and 52 (all participants met with the GP at the beginning of treatment). The counselling could be given in a group or on a one-to-one basis. The patches were full strength and delivered 15 mg nicotine over 16 hours and were free of charge for up to 12 weeks. Claims of abstinence were validated by low breach carbon monoxide concentration (<10 ppm). Control: Placebo patches.	One-year.	The nicotine patches doubled the chances of cessation for at least 12 months. The average time spent counselling and prescribing the patch was 31 mins; the average time spent on counselling alone was 25 mins; the percent of treatment time with GP was 67%; the cost per min of time with the GP was £1.77 vs. £0.43 for the nurse; the average number of weeks the nicotine patches were used was 4.4; the cost of one week of nicotine patches to the NHS was £9.07; the pharmacy fee to the NHS for each prescription was £0.94; percent of patients exempt from the prescription fee was 30%; the cost of the patient booklet was £0.20; and the cost of the biochemical validation of smoking cessation was £1.00. The extra cost per patient treated was £34.15 for the under 35s, for those aged 35-44 and those aged 45-54; £43.08 for those aged 55-65. The extra life years saved per patient treated was £0.086 for the under 35s; 0.099 for those aged 35-44; 0.079 for those aged 45-54; 0.055 for those aged 55-65. The ICER was £397.95 for the under 35s; £344.68 for those aged 35-44; £432.32 for those aged 45-54; and £785.43 for those aged 55-65.	Yes (UK study).	The results apply directly to those smoking 15 or more cigarettes a day.

Wasley MA, McNagny SE, Phillips VL, Ahluwalia JS. 1997 US	Economic analysis. Data from meta analysis were used to populate the model, where possible.	1	++	A hypothetical sample of smokers who smoke 20 or more cigarettes a day.	Aim: Determine the cost-effectiveness of nicotine patch as an adjunct to brief physician counselling during routine office visits. Intervention: Two interventions were compared. The first involved participants who were offered a prescription for the nicotine patch and brief counselling by their physician (group 1). The second involved participants who were offered brief counselling by their physician only (group 2). Baseline assumptions used in the model: 1) 12 month abstinence for group 2 was 4.5%; 2) 12 month abstinence for group 1 was 17.6%; 3) relapse rate after one year of successful abstinence was 35%; 4) treatment lasted eight weeks; 5) underlying spontaneous quit rate was 1%; 6) cost of the patch was $4; 7) the take up rate for the patch was 25%; 8) the compliance rate was 50%; 9) the physicians time was $11.64 for five minutes; 10) the discount rate was 5%.	One-year.	The total number of patients who quit in the nicotine plus counselling group was 20.2 compared to 11.7 in the counselling only group. The total cost for the nicotine plus counselling group was $21,456 compared to $4,656 in the counselling only group. The average cost per life years saved (YLS) range from $965 to $1,585 for men in group 1 and $1,634 to $2,360 for women. The average cost per YLS range from $362 to $594 for men in group 2 and $612 to $884 for women. The incremental cost per YLS ranged from $1,796 to $2,949 for men in group 1 and $3,040 to $4,391 for women. The data indicates that men aged between 45 and 49 and women aged between 50 and 54 will receive the optimal benefit from either therapy.	This study was not carried out in the UK and may not be applicable to the NHS.	None.

Woolacott NF, Jones L, Forbes CA, Mather LC, Sowden AJ, Song FJ, Raftery JP, Aveyard PN, Hyde CJ, Barton PM. T 2002 UK	Decision analysis model	1	++	Data was pooled from a number of papers.	Aim: Estimate the cost-effectiveness of NRT and or bupropion SR compared to advice. The perspective adopted was that of the NHS. Intervention: Four interventions were compared: 1) Advice or counselling only (including GP advice and more intensive counselling by other health professionals); 2) Advice plus NRT; 3) Advice plus bupropion SR; 4) Advice plus NRT and bupropion SR.	One-year	The cost per life time quitter was £196 (£653 for more intensive counselling) for brief advice only; £2288 (£1173) for brief advice and NRT; £1799 (£9649) for brief advice and bupropion SR; and £2683 (£1314) for brief advice and bupropion SR and NRT. The life time quit rate was 0.018 (0.0540 for more intensive counselling) brief advice only; 0.033 (0.0879) for brief advice and NRT; 0.0423 (0.1075) for brief advice and bupropion SR; and 0.0536 (0.1305) for brief advice and bupropion SR and NRT. The base line estimates give an incremental cost per life year saved of £1000-2399 for NRT, £639-1492 for bupropion SR and £890-1969 for NRT plus bupropion SR. The base line estimates give an incremental cost per QALY of £741-1777 for NRT, £473-1106 for bupropion SR and £660-1459 for NRT plus bupropion SR.	Yes (UK study).	None

Section 7: Excluded Studies

7.1 EXCLUDED PAPERS

7.1.1 Identified from the NHS search:

Paper	Reason for Exclusion
Akehurst RL Piercy J. Cost-effectiveness of the use of transdermal Majorette patches relative to GP counselling and nicotine gum in the prevention of smoking related diseases. British Journal of Medical Economics. 1994; 7 115-122.	This study focused entirely on NRT, which is not the focus of our review.
Hajek P West R. Treating nicotine dependence: the case for specialist smokers' clinics. *Addiction*. 1998; 93 (5): 637-640.	This study does not examine an intervention but is an editorial discussion.
Hobbs SD Bradbury AW. Smoking cessation strategies in patients with peripheral arterial disease: An evidence-based approach. *European Journal of Vascular and Endovascular Surgery*. 2003; 341-34.	This reviews patients with peripheral arterial disease. Our review does not focus on these patients.
Jackson G, Bobak A, Chorlton I, Fowler G, Hall R, Khimji H, Matthews H, Stapleton J, Steele C, Stillman P, Sutherland G, Swanton RH. Smoking cessation: a consensus statement with special reference to primary care. International Journal of Clinical Practice. 2001; 55 (6): 385-392.	This is a discussion of smoking cessation within primary care and does not investigate an intervention as part of a study.
Law M Tang JL. An analysis of the effectiveness of interventions intended to help people stop smoking. *Archives of Internal Medicine*. 1995; 155 1933-1941.	This study does not report the costs of the intervention.

7.1.2 Identified from the work place searches:

Nielsen K Fiore MC. Cost-benefit analysis of sustained-release bupropion, nicotine patch, or both for smoking cessation. *Preventive Medicine*. 2000; 209-216	This study focused entirely on NRT, which is not the focus of our review.
Oster G, Huse DM, Delea TE, Colditz GA. Cost-effectiveness of nicotine gum as an adjunct to physician's advice against cigarette smoking. *Journal of the American Medical Association*. 1986; **256** (10): 1315-1318.	This was deemed to be too dated to be of relevance.

7.1.3 Identified from the mass media place searches:

McEwen A West R. Smoking cessation activities by general practitioners and practice nurses. Tobacco Control. 2001; 10 (1): 27-32.	This study investigated general practitioners' and practice nurses' self reported behaviour, attitudes, and knowledge to smoking cessation. It did not investigate smoking cessation interventions.
O'Loughlin J, Makni H, Tremblay M, Lacroix C, Gervais A, Dery V, Meshefedjian G, Paradis G. Smoking cessation counseling practices of general practitioners in Montreal. *Preventive Medicine*. 2001; **33** (6): 627-38.	This is a survey of smoking cessation services and not a study of smoking cessation interventions.
Smith SE, Warnakulasuriya KAAS, Feyerabend C, Belcher M, Cooper DJ. A smoking cessation programme conducted through dental practices in the UK. British Dental Journal Place Published: London. 1998; 185 (6): 299-303.	This study did not report the costs of the intervention.
Song F, Raftery J, Aveyard P, Hyde C, Barton P, Woolacott N. Cost-effectiveness of pharmacological interventions for smoking cessation: a literature review and a decision analytic analysis. Medical Decision Making. 2002; 22 (Supplement): S26-S37-	This is an economic analysis of pharmacological interventions for smoking interventions, which is not the focus of our review.
Watt RG, Daly B, Kay EJ. Prevention. Part 1: smoking cessation advice within the general dental practice. *British Dental Journal*. 2003; **194** (12): 665-8.	This study analysed advice to general practitioners on how to provide cessation advice. An intervention is not investigated.

Section 8: Search Strategy

8.1 NHS PROGRAMMES SEARCH STRATEGIES AND RESULTS

NHS EED. CRD internal database. 1994-2006/Jul. Searched 10th August 2006.

54 records were retrieved

s smok$ or tobacco$ or cigarette$ or cigar$ or nicotine or bidi$ or kretek or paan or gutkha or snuff or snus or betel or hand(w)roll$
s policy or policies or program or programs or programme or programmes or service or services or initiative$ or intervention$ or campaign$
s helpline$ or help(w)line$ or hotline$ or hot(w)line$ quitline$ or quit(w)line$
s support or advice or information or patient(w)leaflet$ or patient(w)flyer$ or training or guidance or counseling or counselling or patient(w)education
s bupropion or zyban or NRT or nicotine(w)replacement or nicotine(w)patch$ or Nicorette or nicotine(2w)gum
s s2 or s3 or s4 or s5
s s1 and s6
s united(w)kingdom/co1
s s7 and s8

HEED. CD-ROM. August 2006. Searched 10th August 2006.

87 records were retrieved.

AX=smoke or smoker or smokers or smoking or tobacco or tobaccos or cigarette or cigarettes or cigar or cigars or nicotine or bidi or bidis or beedi or beedis or kretek or paan or gutkha or snuff or snus or betel or (hand roll) or (hand rolled) or (hand rolling)
AX=policy or policies or program or programs or programme or programmes or service or services or initiative or initiatives or intervention or interventions or campaign or campaigns or campaigning
AX=helpline or helplines or (help line) or (help lines) or hotline or hotlines or (hot line) or (hot lines) or quitline or quitlines or (quit line) or (quit lines)
AX=support or advice or information or (patient leaflet) or (patient leaflets) or (patient flyer) or (patient flyers) or training or guidance or counseling or counselling or (patient education)
AX=bupropion or zyban or NRT or (nicotine replacement) or (nicotine patch) or (nicotine patches) or Nicorette or 'nicotine gum' within 3
CS=2 or 3 or 4 or 5
CS=1 and 6
CP=(United Kingdom) or UK or england or wales or ireland or scotland or britain or british
CT=(United Kingdom) or UK or england or wales or ireland or scotland or britain or british
CS=8 or 9
CS=7 and 10

An additional 191 records were retrieved from the results of the review searches.

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APPENDIX A

Health Economic Appraisal Forms

Study identification		Alterman et al. 2001
Checklist completed by:		
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes, to compare the efficacy and costs of three levels of medical behavioural treatment intensity in conjunction with NRT.
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Yes. Three levels of medical-behavioural treatment intensity in conjunction with nicotine replace therapy were compared.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	No. The perspective adopted was not reported.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes
2.1	Were any important alternatives omitted?	No
2.2	Was (should) a do-nothing alternative (be) considered?	No
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	RCT
3.2	Was effectiveness established through an overview of clinical studies?	N/A
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	Costs included the costs for the therapeutic visits and related services. A standard university plant cost of 25% was added these figures. The costs of the patches dispensed were also included. Consequences are short- and long-term smoking cessation rates.
4.1	Was the range wide enough for the research question to hand?	Yes
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Not clear because the perspective was not clear.
4.3	Were capital costs, as well ad operating costs, included?	No
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Not clear because no detailed information on the measurement of costs was reported.

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Not clear
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	Not clear
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes. Cost-effectiveness analysis.
7	**Were costs and consequences adjusted for differential timing?**	No
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	No
7.2	Was any justification given for the discount rate used?	N/A
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	No.
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	No.
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	No
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes for data on consequences but no for data on cost.
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Not clear

10	**Did the presentation and discussion of study results include all issues of concern to users?**	No
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	No.
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	No
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	No
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	No
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes. The study suggested that HI treatment might be considered when available funding was not a critical issue or for use with certain problematic populations.
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		1+
Are the results of the study directly applicable to the patient group targeted by this guideline?		This study was carried out in the US but may be applicable to the UK.

Study identification		Buchanan L. 2002
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes To demonstrate how the clinical practice guidelines (CPG) from the US Department of Health and Human Services were utilised.
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes. But the study only mentioned the cost of the program per participant.
1.2	Did the study involve a comparison of alternatives?	Yes. Implicitly, the comparator was "without the program".
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	No. No perspective was explicitly stated.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes.
2.1	Were any important alternatives omitted?	Not clear
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	No
3.2	Was effectiveness established through an overview of clinical studies?	No
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	Yes. The effectiveness data was based on a non RCT.
4	**What are the important and relevant costs and consequences for each alternative identified?**	The costs of the program per participant included approximately 5 hours of nursing time per individual, long distance phone calls, postage, and educational materials. The consequences were smoking rates and average number of cigarettes per day at delivery and two weeks after delivery.
4.1	Was the range wide enough for the research question to hand?	Not clear
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Not clear
4.3	Were capital costs, as well ad operating costs, included?	Not clear

5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Not clear. No detailed information on costs was provided.
5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Not clear
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	Not clear
6	**Were costs and consequences valued credibly?**	Not clear
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	No
6.2	Were market values employed for changes involving resources gained or depleted?	Not clear
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	Not clear
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	No.
7	**Were costs and consequences adjusted for differential timing?**	No
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	No
7.2	Was any justification given for the discount rate used?	N/A
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	No
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	No
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	No. No sensitivity analysis was performed.
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	No

9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Not clear
10	**Did the presentation and discussion of study results include all issues of concern to users?**	No
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	No.
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	No
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	No
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		2-
Are the results of the study directly applicable to the patient group targeted by this guideline?		Although not a UK study, it is applicable to the UK.

Study identification		Buck DJ et al. 2000
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes. To assess the cost-effectiveness of a smoking cessation programme.
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	No (Implicitly, the alternative is 'without intervention')
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	Yes. Costs were calculated from smokers, family physicians, organizers, trainers, and all parties combined.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes for the intervention. No for the comparator.
2.1	Were any important alternatives omitted?	Yes
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	N/A
3.2	Was effectiveness established through an overview of clinical studies?	N/A
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	Yes
4	**What are the important and relevant costs and consequences for each alternative identified?**	Costs included the cost of smokescreen, training costs, intervention costs to physicians and to smokers. The consequences were net abstinence rates.
4.1	Was the range wide enough for the research question to hand?	Yes
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Yes.
4.3	Were capital costs, as well ad operating costs, included?	Yes
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	No
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	The issue of attrition of workshop costs is complex. This was handled in sensitivity analysis.
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes
7	**Were costs and consequences adjusted for differential timing?**	Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	No
7.2	Was any justification given for the discount rate used?	No
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	No
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	No
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes. Sensitivity analysis was performed.
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	The study results were within the assumed ranges for sensitivity analysis.

10	**Did the presentation and discussion of study results include all issues of concern to users?**	Yes
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes. The authors noted the differences of their study from other studies and the problems of comparing results across types of interventions, settings, countries and time periods.
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	No
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	No
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	No
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		2 ++
Are the results of the study directly applicable to the patient group targeted by this guideline?		This study was not carried out in the UK and may not be applicable to the NHS.

Study identification		Butler et al. 1999
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes. To compare the clinical and cost-effectiveness of motivational consulting with brief advice to quit smoking.
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Yes. Motivational consulting was compared with brief advice for smokers in general practice.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	No. The perspective was not stated.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes
2.1	Were any important alternatives omitted?	No
2.2	Was (should) a do-nothing alternative (be) considered?	No
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	Yes
3.2	Was effectiveness established through an overview of clinical studies?	N/A
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	Costs included training (trainer and trainee time plus travel costs) plus the cost of consultations. The consequences were point prevalence at six months of self-reported abstention in the previous month and self-reported abstention from smoking in the previous 24 hours.
4.1	Was the range wide enough for the research question to hand?	Yes
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Not clear because the perspective is not clear.
4.3	Were capital costs, as well ad operating costs, included?	No

5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes
5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	The duration and number of return visits and associated patient travel costs were recorded but not included in the cost calculation. This means that they carried no weight in the subsequent analysis.
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	No
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes. Cost-effectiveness analysis.
7	**Were costs and consequences adjusted for differential timing?**	No
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	No
7.2	Was any justification given for the discount rate used?	N/A
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	Incremental costs and incremental effects were calculated.
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	Yes.
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	No

9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Not clear because no sensitivity analysis was performed.
10	**Did the presentation and discussion of study results include all issues of concern to users?**	No
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	No
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	No
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	No
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		1 +
Are the results of the study directly applicable to the patient group targeted by this guideline?		Yes (UK study)

Study identification		Cromwell et al. 1997
Checklist completed by:		
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes. Determine the relative cost-effectiveness of the Agency for Health and Care Policy Resource's Smoking Cessation Clinical Practice Guidelines.
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	No. No comparator was stated. It seemed to be without implementing the guideline, i.e. no intervention.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	Yes. A societal perspective was adopted.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes for the interventions.
2.1	Were any important alternatives omitted?	Yes.
2.2	Was (should) a do-nothing alternative (be) considered?	Yes.
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	N/A
3.2	Was effectiveness established through an overview of clinical studies?	Yes. Effectiveness data was drawn from meta analysis.
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	Costs included costs for time inputs by physician, registered nurse and psychologist, overhead costs, costs for educational materials, costs for nicotine replace therapy. Consequences included quit rate, number of quitters, life-years saved and quality life-years saved.
4.1	Was the range wide enough for the research question to hand?	Yes
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Yes
4.3	Were capital costs, as well ad operating costs, included?	No

5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes
5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Yes. Costs associated with patient travel and cessation counselling times were not included.
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	No
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	Yes
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes, a cost-effectiveness analysis was carried out.
7	**Were costs and consequences adjusted for differential timing?**	Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	Yes for future life-years saved.
7.2	Was any justification given for the discount rate used?	No
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	No
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	No. Average cost per quitter, average cost per life-year saved and average cost per QALY saved were calculated.
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	No

9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Yes. The results were sensitive to discount rates, relapse rates and the costs associated with patient travel and cessation counselling time. Altering the assumption about the number of smokers willing to try to quite has a slight impact on the results.
10	**Did the presentation and discussion of study results include all issues of concern to users?**	Yes
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes.
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	Yes
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes.
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		1++
Are the results of the study directly applicable to the patient group targeted by this guideline?		The study was carried out in the USA.

Study identification		Cummings et al. 1989
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Yes (implicitly, the comparator was 'without counselling')
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	Yes. A societal perspective was used.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes for the intervention. No for the intervention.
2.1	Were any important alternatives omitted?	Unclear
2.2	Was (should) a do-nothing alternative (be) considered?	Unclear
3	Was the effectiveness of the programmes or services established?	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	N/A
3.2	Was effectiveness established through an overview of clinical studies?	Yes. The effectiveness was established from an overview of published RCTs.
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	Costs included the cost of physician's time devoted to brief advice and to follow-up visits, cost of self-help booklet. The consequences were the rate of smoking cessation and life years saved.
4.1	Was the range wide enough for the research question to hand?	Yes
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	No. The study did not include a variety of costs to patients, such as the value of time spent in travel to and from medical facilities or during visits themselves.
4.3	Were capital costs, as well ad operating costs, included?	No
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes
5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Yes. Omitting the costs to patients may underestimate the costs of the intervention.

5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	No
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes
7	**Were costs and consequences adjusted for differential timing?**	Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	Yes. Effectiveness was discounted.
7.2	Was any justification given for the discount rate used?	Yes. The rationale for this discussed elsewhere.
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	Yes
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	Yes. Incremental cost effectiveness analysis was done for follow-up visit.
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Yes. The results are sensitive to the effectiveness of advice, intervention cost and discount rate.
10	**Did the presentation and discussion of study results include all issues of concern to users?**	Yes

10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes. The index was interpreted intelligently.
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes. The authors noted that they might have underestimated the effectiveness and overestimated the cost of brief advice.
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes. Based on the results, the authors suggested that physician counselling about smoking should be a routine part of the health care of smokers.
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	Yes. The authors suggested more research about how much follow-up visits add to the effectiveness of brief advice and whether special training in smoking cessation program would increase the cost-effectiveness of physicians' advice.
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes. The authors suggested the advice they reviewed was simple and could be provided by all physicians without special training.
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		1+
Are the results of the study directly applicable to the patient group targeted by this guideline?		This study was carried out in the US and was published in 1989; it is therefore unlikely to be relevant to the UK.

Study identification		Feenstra et al. 2005
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Yes. Current practice was compared.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	Yes. A societal perspective was adopted.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes
2.1	Were any important alternatives omitted?	No
2.2	Was (should) a do-nothing alternative (be) considered?	No
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	N/A
3.2	Was effectiveness established through an overview of clinical studies?	Yes
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	Only direct healthcare costs were included (the cost of time spent by counsellor, GP, chest physician and lung nurse, the cost of prescription and the cost of self-help manuals). The consequences were changes in smoking incidence, prevalence, mortality and QOL adjusted life years gained.
4.1	Was the range wide enough for the research question to hand?	No.
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	No. Indirect costs such as productivity costs were not included.
4.3	Were capital costs, as well ad operating costs, included?	No
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	No
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	No
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	Yes
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	No. The study should be categorised as cost-utility analysis.
7	**Were costs and consequences adjusted for differential timing?**	Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	Yes. Future costs and effects were discounted.
7.2	Was any justification given for the discount rate used?	Yes. The Dutch standard annual discount rate was used.
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	Yes
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	Yes. Incremental cost per quitter, incremental cost per life-year and incremental cost per QALY were calculated.
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes. One-way sensitivity analyses were carried out.
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Yes. The study results were sensitive to the rate of discount, the time horizon, resource use estimates, and cessation rates.

10	**Did the presentation and discussion of study results include all issues of concern to users?**	Yes
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes. The authors discussed the methodological differences between their study and others and stated that despite these differences, their cost effectiveness ratios were within the range of values found in the literature.
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Not explicitly.
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	Yes
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		1++
Are the results of the study directly applicable to the patient group targeted by this guideline?		The study was carried out in the Netherlands and is unlikely to be applicable to the UK.

Study identification		Godfrey et al. 2005
Checklist completed by:		
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes. To estimate the cost-effectiveness of the English smoking cessation services.
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	No. No comparator was stated.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	Yes. The personal health and social service perspective was adopted.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes
2.1	Were any important alternatives omitted?	Yes.
2.2	Was (should) a do-nothing alternative (be) considered?	Yes.
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	No.
3.2	Was effectiveness established through an overview of clinical studies?	Yes
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	Yes.
4	**What are the important and relevant costs and consequences for each alternative identified?**	Costs included salary costs of service staff, space and equipment costs and the cost of prescribing NRT and bupropion. The consequences were smoking cessation rate attributable to service intervention and attributable life-years gained.
4.1	Was the range wide enough for the research question to hand?	No
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	No
4.3	Were capital costs, as well ad operating costs, included?	Yes
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Yes. The study did not include the expenditure on the service evaluation and central government administration, and individual clients' costs, such as those for non-prescribed smoking aids.
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	No
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	Yes
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes. Cost-effectiveness analysis.
7	**Were costs and consequences adjusted for differential timing?**	Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	Yes
7.2	Was any justification given for the discount rate used?	Yes. The discount rate was based on NICE recommendation.
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	No. No comparator.
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	The study reported the cost per person setting quit date, the cost per life-year gained and net cost per life-year gained.
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Yes. The results are sensitive to assumptions made.

10	**Did the presentation and discussion of study results include all issues of concern to users?**	Yes
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes. After the potential differences were adjusted, the results are comparable to those found in other studies.
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	Yes
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		2++
Are the results of the study directly applicable to the patient group targeted by this guideline?		Yes. UK study.

Study identification		Meenan et al. 1998
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Yes. Hospital-based smoking cessation intervention was compared with usual care.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	Yes. Hospital perspective was adopted.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes
2.1	Were any important alternatives omitted?	No
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	Yes
3.2	Was effectiveness established through an overview of clinical studies?	N/A
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	Intervention costs included costs to identify newly admitted smokers, to solicit cooperation, to deliver bedside counselling, and to follow-up after discharge. No usual care costs were reported. Consequences were self-reported consecutive abstinence from all tobacco use at 3 and 12 months.
4.1	Was the range wide enough for the research question to hand?	Yes
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Yes
4.3	Were capital costs, as well ad operating costs, included?	Yes
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Yes. The study did not include the incremental room cost, which might underestimate the incremental intervention costs.
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	No
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes. Cost-effectiveness study.
7	**Were costs and consequences adjusted for differential timing?**	Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	Future life-years saved were discounted.
7.2	Was any justification given for the discount rate used?	Yes.
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	Yes
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	Yes
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes. Sensitivity analysis was performed to test the results' sensitivity to changes in discount rates and effectiveness. Simulation analyses were carried out to simulate an implementation scenario to replicate the intervention in a non-research environment.
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes

9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Yes. The results were sensitive to discount rates and quit rates.
10	**Did the presentation and discussion of study results include all issues of concern to users?**	Yes
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	Yes
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		1 +
Are the results of the study directly applicable to the patient group targeted by this guideline?		This study was not carried out in the UK and may not be applicable to the NHS.

Study identification		Prathiba et al 1998
Checklist completed by:		
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Yes. The smoking cessation service provided by the counsellor was compared with the 'no service' alternative which involves the physician's advice only.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	No. The perspective was not stated.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes
2.1	Were any important alternatives omitted?	No
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	No
3.2	Was effectiveness established through an overview of clinical studies?	Yes. Effectiveness data was taken from the literature.
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	Yes. Assumption was made based on the effectiveness data from the literature. Self selection bias may have influenced the results.
4	**What are the important and relevant costs and consequences for each alternative identified?**	The cost was the sum of the salary of the counsellor, including superannuation and national insurance and the overhead costs. The consequence was the sustained smoking cessation rate.
4.1	Was the range wide enough for the research question to hand?	Not clear.
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Not clear because the perspective was not clear.
4.3	Were capital costs, as well ad operating costs, included?	No
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Patient costs were not included in the analysis, whose impact was examined in the sensitivity analysis.
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	No
6	**Were costs and consequences valued credibly?**	
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes. Cost-effectiveness analysis.
7	**Were costs and consequences adjusted for differential timing?**	No
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	No
7.2	Was any justification given for the discount rate used?	N/A
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	Yes
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	Yes. Assuming the cost for physician's advice was the same for those who attended the programme and those who refused to attended, the additional cost per additional success or per life-year saved was calculated.
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	No

9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Yes. The results are sensitive to the inclusion of patient costs, changes in percentage of patients who stop smoking as a result of physician's advice and changes in the cost for physician's advice.
10	**Did the presentation and discussion of study results include all issues of concern to users?**	No
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	No
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	Yes
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	No
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		2+
Are the results of the study directly applicable to the patient group targeted by this guideline?		Yes (UK study).

Study identification		Riemsma et al. 2003
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes Investigate the effectiveness of interventions that use a stage based approach to smoking cessation.
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	No. The paper was a systematic review of the effectiveness of stage based interventions to promote smoking cessation. It reviewed two trials which included an economic evaluation.
1.2	Did the study involve a comparison of alternatives?	Yes. The comparators were non-stage based intervention or no intervention
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	No. No perspective was explicitly stated.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes for the intervention.
2.1	Were any important alternatives omitted?	Yes
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	No
3.2	Was effectiveness established through an overview of clinical studies?	Yes. Systematic review of RCTs.
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	No cost information. The consequences were cessation rate and movement through stages.
4.1	Was the range wide enough for the research question to hand?	Not clear
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Not clear
4.3	Were capital costs, as well ad operating costs, included?	No
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	No information on costs. For the measurement of consequences, the authors stated the methodological quality of the trials varied. The main problem was the lack of information about the validity of the instruments used to assess stage of change.

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Not clear
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	Not clear
6	**Were costs and consequences valued credibly?**	Not clear
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes for consequences.
6.2	Were market values employed for changes involving resources gained or depleted?	N/A
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	N/A
7	**Were costs and consequences adjusted for differential timing?**	No – a systematic review was carried out
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	No
7.2	Was any justification given for the discount rate used?	N/A
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	No
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	No
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	No
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	No
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Not clear

10	**Did the presentation and discussion of study results include all issues of concern to users?**	No. No costs were mentioned.
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	No. The conclusion was based on the review of effectiveness evidence.
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	No
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	No
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	The authors suggested that there is a need for methodologically sound and theoretically consistent intervention studies to assess adequately the efficacy of stage based approaches to changing smoking behaviour.
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	No
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		+ for systematic review but - for economic evaluation.
Are the results of the study directly applicable to the patient group targeted by this guideline?		Not clear.

Study identification		Scott Lennox et al. 2001
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes. The research question was to compare the cost effectiveness of computer tailored and non-tailored letter. But the paper reported the results on non-tailored letter compared with no letters.
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Yes
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	No. The perspective was not stated.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes
2.1	Were any important alternatives omitted?	No
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	RCT
3.2	Was effectiveness established through an overview of clinical studies?	N/A
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	Not clear for costs. Consequences included prevalence of validated abstinence at six months and changes in intention to stop smoking in the next six months.
4.1	Was the range wide enough for the research question to hand?	Not clear
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Not clear because the perspective is not clear.
4.3	Were capital costs, as well ad operating costs, included?	No
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	No detailed information was reported.

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Not clear
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	Not clear
6	**Were costs and consequences valued credibly?**	Not clear
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	No
6.2	Were market values employed for changes involving resources gained or depleted?	Not clear
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes. Cost-effectiveness analysis.
7	**Were costs and consequences adjusted for differential timing?**	Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	Yes
7.2	Was any justification given for the discount rate used?	No
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	Yes
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	The authors reported the increase in cost for each additional quitter in the non-tailored letter group compared with the no letter group. But it was not clear how they calculated the results.
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes. Different case scenarios were considered.
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Not clear since no sensitivity analysis was reported.

10	**Did the presentation and discussion of study results include all issues of concern to users?**	Yes
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes. The authors found that the cessation rate in this study was lower than those in other studies and if the same methods were used, it would have been higher.
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes. The authors stated that the other potential settings included smoking helplines and workplaces.
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	Yes.
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes.
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		+
Are the results of the study directly applicable to the patient group targeted by this guideline?		Yes (UK study).

Study identification		Severson et al. 1997
Checklist completed by:		
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	No. The objective was not a cost effectiveness analysis of the intervention.
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Not clear whether the paper was aimed to compare the cost effectiveness of extended care and minimal care.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	No. The perspective was not reported.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes for the intervention.
2.1	Were any important alternatives omitted?	Yes
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	**Yes**
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	RCT
3.2	Was effectiveness established through an overview of clinical studies?	N/A
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	Costs included training time, the time involved for staff assessment and advice/counselling, and materials. The consequences were quit rate.
4.1	Was the range wide enough for the research question to hand?	Not clear
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Not clear
4.3	Were capital costs, as well ad operating costs, included?	Not clear
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	No. No detailed information on costs were reported.

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Not clear
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	Not clear
6	**Were costs and consequences valued credibly?**	No
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	No
6.2	Were market values employed for changes involving resources gained or depleted?	Not clear
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	Not clear
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	No. The study was not a cost-effectiveness analysis.
7	**Were costs and consequences adjusted for differential timing?**	No
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	No
7.2	Was any justification given for the discount rate used?	N/A
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	No
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	No
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	No
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes for data on effectiveness.
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Not clear

10	**Did the presentation and discussion of study results include all issues of concern to users?**	No
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	No
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	No
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	No
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	No
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	No
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		1+
Are the results of the study directly applicable to the patient group targeted by this guideline?		This study was carried out in the US and may not be applicable to the UK.

Study identification		Smith PM et al. 2002
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	No
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	No. There was no comparison.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	No. The perspective was not stated.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes for intervention.
2.1	Were any important alternatives omitted?	Yes. No alternatives were included in the study.
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	N/A
3.2	Was effectiveness established through an overview of clinical studies?	N/A
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	Yes.
4	**What are the important and relevant costs and consequences for each alternative identified?**	Costs included an annual budget for the program to cover start-up and maintenance costs and ongoing direct costs. Consequences were cessation rates.
4.1	Was the range wide enough for the research question to hand?	Yes
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Not clear because the perspective was not clear.
4.3	Were capital costs, as well ad operating costs, included?	No. Indirect costs were not included.
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Not clear. No details on costs were reported.
5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Not clear.

5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	Not clear
6	**Were costs and consequences valued credibly?**	Not clear.
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes for consequences and not clear for costs.
6.2	Were market values employed for changes involving resources gained or depleted?	Not clear
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	No.
7	**Were costs and consequences adjusted for differential timing?**	No
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	No
7.2	Was any justification given for the discount rate used?	N/A
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	No
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	No
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	No
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes for data on consequences and no for data on costs.
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Not clear since no sensitivity analysis was reported.
10	**Did the presentation and discussion of study results include all issues of concern to users?**	No

10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	No.
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes.
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	Yes
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes. The authors concluded that the program, relatively inexpensive to deliver, appeared to be acceptable to the majority of smokers who were hospitalised and could be extended to hospital employees and their families, work-sites, and community on a cost-recovery basis.
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		2-
Are the results of the study directly applicable to the patient group targeted by this guideline?		This study was carried out in the US and may not be applicable to the UK.

Study identification		Stapleton J. 2001
Checklist completed by:		
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes. To calculate the cost-effectiveness of the NHS smoking cessation services.
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	No. No comparator was explicitly stated. It might be “without the services”.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	Implicitly, the perspective was that of NHS.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	**No**
2.1	Were any important alternatives omitted?	Yes
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	No
3.2	Was effectiveness established through an overview of clinical studies?	No
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	Yes.
4	**What are the important and relevant costs and consequences for each alternative identified?**	It seemed that the authors were not clear about what were included in the total costs of the services. The costs identified included start-up and monitoring costs, and prescription costs. Consequences included life-years saved by quitting permanently.
4.1	Was the range wide enough for the research question to hand?	Not clear
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Not clear
4.3	Were capital costs, as well ad operating costs, included?	Not clear
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Not clear. No detailed information was reported.

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	Yes
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	Not clear
6	**Were costs and consequences valued credibly?**	Not clear
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	No
6.2	Were market values employed for changes involving resources gained or depleted?	Not clear
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	Not clear
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes a cost effectiveness analysis was carried out.
7	**Were costs and consequences adjusted for differential timing?**	Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	The authors mentioned discounting for life-years gained.
7.2	Was any justification given for the discount rate used?	No
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	No. The cost per life year saved was calculated as the cost per patient treated being divided by the estimated life years saved per patient treated.
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	No
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	No
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	No

9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Not clear
10	**Did the presentation and discussion of study results include all issues of concern to users?**	No
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	No
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	No
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	No
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	No
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		2-
Are the results of the study directly applicable to the patient group targeted by this guideline?		Yes (UK study)

Study identification		Stapleton et al. 1999
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Yes. (GP counselling with nicotine-patch treatment vs GP counselling alone)
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	Yes. It was the UK NHS.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes
2.1	Were any important alternatives omitted?	Yes
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	Yes.
3.2	Was effectiveness established through an overview of clinical studies?	N/A
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	Costs included the costs of counselling time, the cost of nicotine patches, the cost of the patients booklet, and the cost of the biochemical validation of abstinence. The consequences were life years saved, lifetime cessation and lifetime 'unaided' cessation rate.
4.1	Was the range wide enough for the research question to hand?	Yes
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Yes
4.3	Were capital costs, as well ad operating costs, included?	No
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	No
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	No
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes
7	**Were costs and consequences adjusted for differential timing?**	Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	Yes. Future effectiveness was discounted. Since the costs were incurred within a year, no discounting was necessary.
7.2	Was any justification given for the discount rate used?	Yes. The discount rate was from the Department of Health, UK.
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	Yes
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	Yes
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	The results were sensitive to variation in the 12-month cessation rate attributable to the intervention, changes in the cost of nicotine patches, LYS by stopping smoking, the relapse rate after 1 year of abstinence, and the number of nicotine patches used.

10	**Did the presentation and discussion of study results include all issues of concern to users?**	Yes
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes. The authors suggested their results on heavy smokers could be applied to those who smoke between ten to 14 cigarettes per day.
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	No
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes. The authors suggested that if implemented, the proposal for treatment in general practice would function alongside the government proposed specialist clinics. Although it would initially require extra expenditure by the NHS, it would be a cost effective investment.
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		1++
Are the results of the study directly applicable to the patient group targeted by this guideline?		Yes. The study was carried out in the UK and the results are directly applicable to the NHS.

Study identification		Wasley et al. 1997
Checklist completed by:		**YY**
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Yes. Nicotine patch plus counselling vs physician counselling alone.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	The perspective was not explicitly stated. It might be from physicians or payers' perspective.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes
2.1	Were any important alternatives omitted?	Unclear
2.2	Was (should) a do-nothing alternative (be) considered?	Yes
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	N/A
3.2	Was effectiveness established through an overview of clinical studies?	Yes. Data from meta analysis of clinical trials were used.
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	The costs included the cost of the Nicotine Patch, the cost of Brief Physician Counselling. The consequences were the difference in the number of patients who quit smoking in both groups and the additional years of life saved.
4.1	Was the range wide enough for the research question to hand?	Yes
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Not clear.
4.3	Were capital costs, as well ad operating costs, included?	No
5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes

5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	No
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	No
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes
7	**Were costs and consequences adjusted for differential timing?**	Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	Yes. Future life years gained were discounted. All costs were assumed to occur in one year and therefore not discounted.
7.2	Was any justification given for the discount rate used?	No.
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	Yes
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	Yes
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes. Sensitivity analysis was performed.
9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	No
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Yes. The results were sensitive to the discount rate and a combination of factors in their best- and worst-case scenarios.

10	**Did the presentation and discussion of study results include all issues of concern to users?**	Yes
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes. The authors suggested that it might be difficult to generalise their conclusions to many populations such as minorities and poor smokers.
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	Yes. The authors discussed the limitations of the study, including estimation the cost-effectiveness in YLS, rather than in QALY, and failure to address cost issues involving changes in health service utilisation that result from quitting smoking.
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		1++
Are the results of the study directly applicable to the patient group targeted by this guideline?		This study was not carried out in the UK and may not be applicable to the NHS.

Study identification		Woolacott et al. 2002
Checklist completed by:		
	Evaluation criterion	**Comments**
1	**Was a well-defined question posed in answerable form?**	Yes
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes
1.2	Did the study involve a comparison of alternatives?	Yes. NRT and/or bupropion SR for smoking cessation was compared with and in addition to advice or counselling.
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	Yes. The NHS perspective was adopted.
2	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? Did what? To whom? Where? And how often?)?**	Yes
2.1	Were any important alternatives omitted?	No
2.2	Was (should) a do-nothing alternative (be) considered?	No
3	**Was the effectiveness of the programmes or services established?**	Yes
3.1	Was this done through a randomised, controlled trial? If so, did the trial protocol reflect what would happen in regular practice?	No
3.2	Was effectiveness established through an overview of clinical studies?	Yes. Data was pooled from a number of papers.
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	N/A
4	**What are the important and relevant costs and consequences for each alternative identified?**	The costs included costs for brief advice from a GP (including costs for GP time with or without prescription, with or without consultation); drug costs and costs for counselling within the NHS by intermediate-level or specialist-level services. The effectiveness outcomes were the number of subjects achieving continuous abstinence at 12 months and the number of life-years saved or QALYs saved.
4.1	Was the range wide enough for the research question to hand?	Yes
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of individuals and third party payers.)	Yes
4.3	Were capital costs, as well ad operating costs, included?	No

5	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life years)?**	Yes
5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	No
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	No
6	**Were costs and consequences valued credibly?**	Yes
6.1	Were the sources of all values clearly identified? (Possible sources included market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Yes
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	N/A
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis –cost-effectiveness, cost-benefit, cost utility – been selected)?	Yes. Cost-effectiveness and cost-utility analysis.
7	**Were costs and consequences adjusted for differential timing?**	No
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	Costs were not discounted as only the short-term cost was included in the model. Future effectiveness was not discounted.
7.2	Was any justification given for the discount rate used?	N/A
8	**Was an incremental analysis of costs and consequences of alternatives performed?**	Yes
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	Yes. Incremental cost per lifetime quitter, incremental cost per life-year saved and incremental cost per QALYs saved were calculated for different smoking cessation interventions.
9	**Was allowance made for uncertainty in the estimates of costs and consequences?**	Yes

9.1	If data on cost or consequences were stochastic, were appropriate statistical analyses performed?	Yes for data on effectiveness and no for data on cost.
9.2	Were study results sensitive to changes in the values (within the assumed ranges for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	Yes. The results were sensitive to the estimates of effect, the estimates of cost, values of life-years saved per quitter and number of QALYs gained per quitter.
10	**Did the presentation and discussion of study results include all issues of concern to users?**	
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential difference in study methodology?	Yes
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	Yes
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	No
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be re-deployed to other worthwhile programmes?	Yes. The study estimated the impact of NRT and bupropion SR on cost and effectiveness for the NHS in England and Wales.
Overall assessment of the study		
How well was the study conducted? Code ++,+ or -		1++
Are the results of the study directly applicable to the patient group targeted by this guideline?		Yes (UK study)