

# Group behaviour therapy programmes for smoking cessation (Review)

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## ABSTRACT

### Background

Group therapy offers individuals the opportunity to learn behavioural techniques for smoking cessation, and to provide each other with mutual support.

### Objectives

We aimed to determine the effects of smoking cessation programmes delivered in a group format compared to self-help materials, or to no intervention; to compare the effectiveness of group therapy and individual counselling; and to determine the effect of adding group therapy to advice from a health professional or to nicotine replacement. We also aimed to determine whether specific components increased the effectiveness of group therapy. We aimed to determine the rate at which offers of group therapy are taken up.

### Search strategy

We searched the Cochrane Tobacco Addiction Group Trials Register, with additional searches of MEDLINE and PsycINFO, including the terms behavior therapy, cognitive therapy, psychotherapy or group therapy, in January 2005.

### Selection criteria

We considered randomized trials that compared group therapy with self help, individual counselling, another intervention or no intervention (including usual care or a waiting list control). We also considered trials that compared more than one group programme. We included those trials with a minimum of two group meetings, and follow up of smoking status at least six months after the start of the programme. We excluded trials in which group therapy was provided to both active therapy and placebo arms of trials of pharmacotherapies, unless they had a factorial design.

### Data collection and analysis

We extracted data in duplicate on the participants, the interventions provided to the groups and the controls, including programme length, intensity and main components, the outcome measures, method of randomization, and completeness of follow up. The main outcome measure was abstinence from smoking after at least six months follow up in patients smoking at baseline. We used the most rigorous definition of abstinence in each trial, and biochemically validated rates where available. Subjects lost to follow up were analyzed as continuing smokers. Where possible, we performed meta-analysis using a fixed-effects (Mantel-Haenszel) model.

### Main results

A total of 55 trials met inclusion criteria for one or more of the comparisons in the review. Sixteen studies compared a group programme with a self-help programme. There was an increase in cessation with the use of a group programme (N = 4395, odds ratio (OR) 2.04, 95% confidence interval (CI) 1.60 to 2.60). Group programmes were more effective than no intervention controls (seven trials, N = 815, OR 2.17, 95% CI 1.37 to 3.45). There was no evidence that group therapy was more effective than a similar intensity of individual counselling. There was limited evidence that the addition of group therapy to other forms of treatment, such as advice from a health professional or nicotine replacement, produced extra benefit. There was variation in the extent to which those offered group therapy accepted the treatment. There was limited evidence that programmes which included components for increasing cognitive and behavioural skills and avoiding relapse were more effective than same length or shorter programmes without these components. This

analysis was sensitive to the way in which one study with multiple conditions was included. We did not find an effect of manipulating the social interactions between participants in a group programme on outcome.

### **Authors' conclusions**

Group therapy is better for helping people stop smoking than self help, and other less intensive interventions. There is not enough evidence to evaluate whether groups are more effective, or cost-effective, than intensive individual counselling. There is not enough evidence to support the use of particular psychological components in a programme beyond the support and skills training normally included.

## **PLAIN LANGUAGE SUMMARY**

Attending group smoking cessation programmes helps smokers to quit

Group programmes are more effective for helping people to stop smoking than being given self-help materials without face-to-face instruction and group support. The chances of quitting are more than doubled. It is unclear whether groups are better than individual counselling or other advice, but are more effective than no treatment. Not all smokers making a quit attempt want to attend group meetings, but for those who do they are likely to be helpful.

## **BACKGROUND**

Group therapy is a common method of delivering smoking cessation interventions. Over 100 group therapies have been described in the literature (Hajek 1996). The purposes of group programmes have been summarized as: to analyze motives for group members' behaviour; to provide an opportunity for social learning; to generate emotional experiences; and to impart information and teach new skills (Hajek 1985; Hajek 1996). Group programmes may be led by professional facilitators such as clinical psychologists, health educators, nurses or physicians, or occasionally by successful users of the programme.

The implementation of smoking cessation programmes in groups has been a popular method of delivering behavioural interventions. Behavioural interventions typically include such methods as coping and social skills training, contingency management, self control, and cognitive-behavioural interventions. The use of a group format for the delivery of a behavioural intervention would appear to have two underlying rationales. Lying between self-help methods with minimal therapist contact and intensive individual counselling/therapy, a group might offer better cessation rates than the former with lower costs per smoker than the latter. There may be a specific therapeutic benefit of the group format in giving smokers the opportunity to share problems and experiences with others attempting to quit. This might lead to increased quit rates even compared to individual face-to-face methods.

More recent research has focused on identifying the components that contribute most to the success of the intervention. In particular, there is interest in ways to enhance programmes with components which could be specifically helpful for those with poor success rates for quitting, such as people with histories of depressive

disorder or substance abuse. In addition to evaluating the benefit of generic group behaviour therapy for smoking cessation, this updated review sets out to review the evidence for including specific strategies or psychological techniques in group programmes.

## **OBJECTIVES**

To determine the effect of group-delivered behavioural interventions in achieving long-term smoking cessation.

We wished to test the following hypotheses:

1. Programmes including group meetings lead to higher rates of smoking cessation than programmes without group contact
2. Programmes including group meetings lead to higher rates of smoking cessation than individual counselling
3. Programmes including group meetings lead to higher rates of smoking cessation than no treatment or minimal interventions
4. Group programmes as an adjunct to nicotine replacement therapy (NRT) lead to higher rates of smoking cessation than NRT alone
5. Group programmes lead to higher rates of smoking cessation if there is increased group interaction
6. Group behaviour therapy programmes lead to higher rates of smoking cessation if they are longer or more intensive, include more components, or included specific components to aid cessation or assist relapse prevention

Hypothesis 6 was added when updating the review in 2002. Studies comparing different forms of group programmes were previously listed as excluded.

A second objective was to determine the rate of uptake of group therapy under different intervention conditions.

## CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

### Types of studies

Trials were eligible for inclusion if participants were randomly allocated to treatment groups. Trials of worksite smoking cessation programmes which randomized work sites to different programmes were included. Studies which randomized therapists, rather than smokers, to offer group therapy or control were included provided that the specific aim of the study was to examine the effect of group therapy on smoking cessation

### Types of participants

Smokers of either gender irrespective of their initial level of nicotine dependency, recruited from any setting, with the exception of trials recruiting pregnant women in antenatal care settings since interventions for pregnant women are reviewed separately (Lumley 2004).

### Types of intervention

We considered studies in which smokers met for scheduled meetings and received some form of behavioural intervention, such as information, advice and encouragement or cognitive behavioural therapy (CBT) delivered over at least two sessions. We excluded studies of interventions where participants met once for an orientation or information session. Studies which included group meetings but which were primarily investigating the efficacy of aversive smoking, acupuncture, hypnotherapy, exercise or partner support were excluded unless there were other relevant arms. Trials investigating these specific components have been separately reviewed by Hajek 2001, White 2002, Abbot 2005, Ussher 2005 and Park 2002 respectively. Trials in which smokers received group therapy in addition to active or placebo pharmacotherapy were excluded unless there were other relevant arms. The effect of nicotine replacement therapy has been evaluated in a separate review (Silagy 2004) but studies in which group therapy was tested as an adjunct to nicotine replacement were included.

### Types of outcome measures

The main outcome was abstinence from cigarettes at follow up at least six months after the start of treatment. Trials that reported only shorter follow up or had no measurement of smoking cessation were excluded.

In each study the strictest available criteria to define abstinence were used. For example, in studies where biochemical validation of cessation was available, only those participants who met the criteria for biochemically confirmed abstinence were counted as abstinent. Wherever possible, a sustained cessation rate, rather than point prevalence, was used. Where patients were lost to follow up they were regarded as being continuing smokers.

## SEARCH METHODS FOR IDENTIFICATION OF STUDIES

See: Cochrane Tobacco Addiction Group methods used in reviews.

We identified trials from the Specialized Register of trials held by the Cochrane Tobacco Addiction Group (date searched January 2005). Details of the general search strategy for this are in the Tobacco Addiction module. Possible trials were retrieved using any of the keywords 'Behaviour therapy', 'Group therapy' and 'Cognitive therapy' or free-text terms 'behav\*' and 'group'. The specialized register includes trials derived from The Cochrane Controlled Trials Register (CENTRAL) which contains the results of handsearching of the following journals covering the Behavioural Sciences: *Behaviour Research and Therapy*; *Journal of Consulting and Clinical Psychology*; *Behaviour Therapy*; *Journal of Behavioural Medicine*. In addition we searched MEDLINE (Ovid, -December 2004) and PsycINFO (Silverplatter, 1996-December 2004) using the terms (smoking or tobacco or nicotine) and (Behavior therapy or Cognitive therapy or Relaxation techniques or Bibliotherapy or Psychotherapy or group therapy) with no limits for trial design. We also checked the US Public Health Service Clinical Practice Guidelines on smoking cessation (Fiore 1996; Fiore 2000) for trials used in meta-analyses assessing the efficacy of different treatment formats and the components of effective interventions.

## METHODS OF THE REVIEW

Trials which met the screening criteria of having one group therapy arm and sufficient length of follow up were identified by LS. For the preparation of the review in 1998 all these were reviewed independently by LS and BB with disagreements referred to TL. Allocation of treatment arms to one or more comparison groups and data extraction was carried out by LS and BB, with disagreements referred to TL. For subsequent updates, study inclusion and data extraction was done independently by LS and TL.

If a trial had both a comparable programme with non-group delivery and a waiting list or minimal intervention control both were included in the appropriate comparisons. If two different group programmes were compared with another method or a control, the group interventions were combined in the comparison of group versus non-group methods.

In studies comparing alternative delivery formats of more than one programme each was treated as a separate trial and entered separately into the meta-analysis. This was felt to be the most conservative approach, since even if the study had reported no significant difference between programmes the power to detect such a difference was generally low. Other factorial designs (e.g. Zelman 1992, crossing behaviour therapy with a nicotine exposure comparison) were collapsed if no interaction was reported.

We made the following comparisons:

**1.1 Groups versus self-help programmes:**

1.1.1 Group therapy plus self-help manuals versus the same self-help programme alone

1.1.2 Group therapy plus self-help manuals versus a different self-help programme

**1.2 Group therapy versus individual counselling sessions:**

1.2.1 Group versus individual therapy, similar intensity, same programme content

1.2.2 Group versus individual therapy, similar intensity, different programme content

**1.3 Group versus other interventions:**

1.3.1 Group therapy versus physician or nurse advice

1.3.2 Group therapy versus health education

**1.4 Group therapy plus NRT versus NRT alone:**

**1.5 Group therapy versus no intervention** (including usual care, minimal contact or a waiting list control)

**2.1 - 2.3 Programmes with additional components versus standard programmes** (with and without matching for intensity and contact time)

**2.4 Group therapy with increased group interaction versus a standard group therapy**

In trials where details of the methodology were unclear, or where results were not expressed in a form which allowed extraction of the necessary key data, investigators were contacted for the required information.

We summarized individual study results as an odds ratio, calculated as:

(number of quitters in intervention group/ number of continuing smokers in intervention group)/  
(number of quitters in control group/ number of continuing smokers in control group).

Where appropriate we performed meta-analysis using a Mantel-Haenszel fixed-effect method to estimate a pooled odds ratio with 95% confidence intervals (Greenland 1985). This replaces the Peto method for pooling data used in previous versions of the review (Yusuf 1985), but does not change the estimated effects substantially. The amount of statistical heterogeneity between trials was estimated using the  $I^2$  statistic (Higgins 2003). Values over 50% can be regarded as moderate heterogeneity, and values over 75% as high.

## DESCRIPTION OF STUDIES

A total of 55 studies were included in the review. Twenty-eight compared a group programme with another cessation treatment method, or a no-intervention control (Bakkevig 2000; Batra 1994; Camaralles 2002; Cottraux 1983; Curry 1988; DePaul 1987; DePaul 1989; DePaul 1994; Garcia 1989; Garcia 2000; Ginsberg 1992; Glasgow 1981; Grant 2003; Gruder 1993; Hall 2002; Hill

1993; Hilleman 1993; Hollis 1993; Jorenby 1995; Leung 1991; McDowell 1985; Minthorn-Biggs 2000; Nevid 1997; Omenn 1988; Pederson 1981; Rice 1994; Sawicki 1993; Smith 2001). Several of these compared group therapy with more than one alternative and were used in each relevant comparison group. Some compared more than one programme or used a factorial design, in which case separate sub-studies have been created for data entry purposes (eg Curry (AA) 1988 and Curry (RP) 1988; Glasgow 1981 D+L, Glasgow 1981 IQK, and Glasgow 1981 P+P; or Etringer 1984 and Etringer 1984 Fading). The other 27 studies did not have a no-group control and contribute only to comparisons between different group programmes.

Most studies recruited community volunteers prepared to participate in group programmes. Two studies recruited in primary care settings (Hollis 1993; McDowell 1985). One study recruited participants with a diagnosed cardiovascular health problem (Rice 1994), one people with diabetes (Sawicki 1993), one people with schizophrenia (George 2000), one alcoholics attending an outpatient treatment programme (Grant 2003). Three studies conducted at DePaul University recruited employees in worksites which had been randomly assigned to provide different programme formats. One other study (Omenn 1988) also recruited at a worksite, but individual smokers were randomized to treatment.

The length, format and content of the group programmes used was variable. For ease of reference we have tabulated this information in the Results section for studies with a non-group therapy control. The description in the Table of Included Studies covers study methods and brief details of each intervention. Descriptions of the interventions used in studies comparing different group programmes are in the Included Studies table.

Most programmes used between six and eight sessions, with the first few sessions devoted to discussion of motivation for quitting, health benefits, and strategies for planning a quit attempt. Specific components at this stage may include signing a contract to quit, or making a public declaration, and nicotine fading (changing the type of cigarette smoked to a lower nicotine brand). Participants may also keep records of the number of cigarettes smoked and the triggers for smoking (self monitoring). Part of the group process also includes discussion and sharing of experiences and problems (intra-treatment social support). Participants may also be instructed on ways to seek appropriate support from friends, colleagues and family (extra-treatment social support). A range of other problem solving skills may also be introduced, including identifying high-risk situations for relapse, generating solutions and discussing or rehearsing responses. Some programmes incorporate more specific components intended to help manage poor mood or depression associated with quitting and withdrawal.

### 1.1. COMPARISON OF GROUP AND SELF-HELP PROGRAMMES

#### Same self-help programme:

Four studies compared a group programme with the same content provided by written materials alone. Curry 1988 tested two approaches, one emphasizing absolute abstinence and the other using a relapse prevention approach. Glasgow 1981 compared three different programmes suitable for self-help use. Two were manuals using a structured behaviour therapy approach, the third was a multimedia quit kit with tips for quitting. All of these programmes lasted for eight weeks. Garcia 2000 compared a 10-session five-week programme, a five-session programme, and a five-session plus self-help manual, with use of a self-help manual alone. Rice 1994 used the shorter Smokeless programme. In this study the self-help participants received five telephone calls during the two-week programme to remind them to open the envelopes containing the appropriate booklet for the day. A further four trials included in this subgroup used a group programme as an adjunct to a televised cessation programme as well as self-help materials. Three of these recruited smokers from worksites which had been randomly assigned to provide manuals or additional group meetings (DePaul 1987; DePaul 1989; DePaul 1994). In the fourth, smokers who had registered to receive a self-help manual were randomized to receive the materials alone or the additional offer of group programmes (Gruder 1993). In this study two different group programmes were tested, both of three sessions. Their results are combined for comparison with self help.

#### **Different self-help programme:**

Five studies did not use an identical programme manual for the group and self-help conditions. In one the participants randomized to use self help were allowed a choice of manuals (Hollis 1993). In addition during a single meeting with the health counsellor they were encouraged to set a quit date, and one follow-up telephone call was arranged. They were then mailed tip sheets and six bi-monthly newsletters. Randomized participants who did not visit the health counsellor to receive their materials were mailed the appropriate programme, so a proportion of those assigned to group therapy effectively received a self-help intervention. In a third treatment condition participants were randomized to make a choice between self-help materials and attending a group programme, but this has not been included in a formal comparison. In one trial (Hilleman 1993) there were no details of the programme used in the group format but the self-help component consisted of a brief pamphlet. In this factorial trial of behavioural components and clonidine there was no evidence for an interaction with the pharmacotherapy so the clonidine/placebo arms were collapsed. In one trial (Omenn 1988) participants with a stated preference for a group programme, and participants with no preference, were randomized to attend either a three- or an eight-week group programme, or use a self-help guide alone. The two group programmes are combined in the analysis. Nevid 1997 compared a culturally tailored programme for Hispanic smokers with an enhanced self-help programme which included one meeting and telephone contact. Batra 1994 compared a group and a self-help approach.

## 1.2 COMPARISON OF GROUP AND INDIVIDUAL THERAPY

Five trials compared a group-based intervention with an individual counselling intervention. Two had comparable intensity in terms of number of visits; one trial (Rice 1994) already noted in previous comparisons, compared group treatment with individual intervention using the same Smokeless programme. Participants met with a clinical nurse specialist therapist for the same schedule of meetings as in the group format. The other in this category (Garcia 1989) compared group therapy and individual sessions with a doctor; all participants also received nicotine gum. The other three studies had a smaller number of individual than group sessions: Jorenby 1995 compared an eight-week group programme with three brief individual counselling sessions from a nurse at one, two and four weeks. Participants in each format were also randomly assigned to receive one of two doses of nicotine patch. Smith 2001 provided three sessions of brief counselling along with nicotine patch therapy, and then randomized participants to one of two group therapy conditions, beginning a week after the quit date, or no further counselling. The two group therapy conditions are combined here. Camarelles 2002 compared a seven-session group therapy programme to two individual sessions, with encouragement to use nicotine patch for addicted participants.

## 1.3 COMPARISON OF GROUP THERAPY WITH OTHER TREATMENTS

### **Group therapy compared to physician or nurse advice alone:**

Of the seven studies in this comparison five recruited in a health-care setting. Two of the studies that compared different programme delivery formats also included an advice only control (Hollis 1993; Rice 1994). Hollis 1993 included a condition in which participants received the same 30-second health provider advice as other arms, and in addition a brief pamphlet from the health counsellor. Rice 1994 included a no-intervention group, but this included advice from a clinical nurse specialist to quit smoking because of the patients' cardiovascular health problems. In three other trials physician advice was an alternative to a group programme. McDowell 1985 compared two different group programmes with an intervention in which participants were asked to attend a 15-minute appointment with their physician for smoking cessation advice and a self-help booklet. Sawicki 1993 compared referral to a group programme to referral for a 15-minute physician advice session. Cottraux 1983 compared a three-session group programme to two ten-minute meetings with a doctor who prescribed a placebo. The authors describe this as a placebo control and the function of the doctor was to recommend the use of the tablets - which contained lactose - rather than to give other support. Bakkevig 2000 recruited community volunteers who were allocated to attend a group programme or go and ask their physician for help. Only 36% consulted their general practitioner whilst 75% attended at least one programme session. In a factorial design with community volunteers Hall 2002 randomized participants to pharmacotherapy with bupropion or nortriptyline or placebo,

along with advice from a physician. Half of all these groups were randomized to an additional 5-session group-based psychological intervention.

### **Group therapy compared to health education**

Rabkin 1984 compared a group programme to an intervention described as health education, consisting of a single group meeting which included a lecture on the health consequences of smoking. Participants decided on a method and made a commitment to quit, then had a single individual counselling session one week later.

#### **1.4 COMPARISON OF GROUP THERAPY PLUS NRT WITH NRT ALONE**

Ginsberg 1992 compared a prescription of nicotine gum plus a four-week behavioural programme, to nicotine gum plus two group sessions at which participants were given educational materials. Jorenby 1995, in addition to the individual counselling used in the comparison above, also included a minimal contact control group in which participants just used 22 mg or 44 mg nicotine patches and attended weekly assessment sessions without counselling.

#### **1.5. GROUP PROGRAMMES COMPARED TO 'NO INTERVENTION' CONTROLS**

Seven trials included control groups which we considered to have little or no specific content to encourage cessation. Hill 1993 used an exercise programme as a placebo control condition. The exercise group did however receive a self-help stop-smoking pamphlet and encouragement to quit. McDowell 1985 included a control group of smokers who had volunteered for the study but were asked only to complete smoking diaries and questionnaires at follow up. In one study the control group had access to standard smoking cessation resources at the substance abuse treatment centre they were attending (Grant 2003). The remaining four trials had waiting list control groups (Cottraux 1983; Leung 1991; Minthorn-Biggs 2000; Pederson 1981).

#### **COMPARISONS BETWEEN DIFFERENT TYPES OF GROUP PROGRAMMES**

##### **2.1. Relapse prevention/skills training**

Trials of relapse prevention and skills training have been grouped together because we found that the main additional features in trials of relapse prevention components were skills acquisition components, sometimes also referred to as cognitive behavioural therapy (CBT). We have included as a separate subgroup in this comparison a trial comparing two public service programmes which differ in length.

We included trials in this comparison if the authors described the additional intervention as intending to prevent relapse or to develop coping skills, whether or not the trials began with smokers who had already quit briefly. We have distinguished between trials that added a component and those that attempted to control for contact time by substituting an alternative component. A group

of trials which specifically addressed mood management are considered separately and are described below.

2.1 Eight trials substituted components which they identified as being particularly relevant to relapse prevention in a programme, controlling for programme length. Becona 1997 compared an eight-week programme including relapse prevention and problem solving to a standard programme control. Brown 1984 compared a seven-week programme with specific relapse prevention training to a non-specific support group. Curry 1988 experimentally developed two contrasting programmes. They aimed to exaggerate the difference between a programme based on theories of physical dependence on nicotine with the necessity for absolute abstinence, and a relapse prevention programme which promoted gradual acquisition of non-smoking skills, and allowed for the possibility of slips to smoking. We compare the relapse prevention (RP) approach with the absolute abstinence (AA) as control. Davis 1986 used a broad spectrum smoking cessation package (Pomerleau & Pomerleau) delivered over six weekly sessions. The Control group used this alone, an Enhanced Control augmented it with discussion of problem situations, and the Experimental group added an active cognitive behavioural skills training programme. We have compared the Experimental condition with the Control group. Goldstein 1989 compared two 11-week courses; a behavioural programme which included relapse prevention skills training against an educational programme which included non-specific group support. Hall 1984 compared a relapse prevention programme including skills rehearsal against a discussion control within a six-week programme which also compared two variants of rapid smoking during the cessation phase. We collapsed these arms. The Stevens 1989 trial began within an intensive cessation programme, and randomized only those who had stopped smoking for four days. Two group programmes were used. The one in which participants rehearsed coping strategies is used as the intervention here, and the one where coping strategies were only discussed is regarded as the control. Zelman 1992 compared two weeks of skills training or supportive counselling crossed with nicotine gum provision or a rapid smoking procedure. The nicotine exposure conditions are collapsed in this analysis.

Six trials tested the effect of adding maintenance or relapse prevention sessions to a programme. Powell 1981 used a preliminary cessation programme which all 51 participants attended together. They were randomized to three maintenance conditions; 1. a four-week support group, 2. a telephone contact system between participants, and 3. a no-contact control. We compare 3 with 1. The support group does not appear to include skills training, only discussion. Killen 1984 used a similar programme before randomizing participants to use of nicotine gum alone, a skills training programme or gum and skills training. To control for the effect of the gum we have not included the results from the skills training only condition. Two studies by Hall and colleagues compared an intensive behavioural treatment including relapse prevention skill training in an eight-week course against a three-week dis-

discussion-based programme. In Hall 1985 both groups of participants received nicotine gum, whilst Hall 1987 used a factorial design and we collapse the gum/placebo arm. Minthorn-Biggs 2000 compared a 16-session programme emphasizing social interaction and coping against a shorter Lung Association programme. Lando 1985 added six post-quit sessions to a cessation programme using nicotine fading. One other trial could have been included in this subgroup, Stevens 1989, using the relapse prevention group compared with the control group which only received the initial cessation programme. To avoid using the same arm twice when calculating a pooled statistic we include it only in the more specific comparison where contact time is matched. We did a sensitivity analysis on the effect of including it here instead.

## 2.2. Mood Management

Six studies investigate the effect of using a cognitive-behavioural intervention to manage the occurrence of negative mood. In two studies (Hall 1994; Hall 1998) the mood management intervention was compared with a shorter programme. In another by the same authors (Hall 1996) the contact time was matched and both programmes consisted of ten sessions over an eight-week period. Two studies had a factorial design with randomization to nicotine gum or placebo (Hall 1996), or to nortriptyline (Hall 1998). These arms were collapsed in this meta-analysis. A fourth study (Brown 2001) compared six-week programmes with and without skills training for control of depressive symptoms, similar to the programme used by Hall and colleagues. A fifth small study recruited people with history of major depressive disorder (MDD) and alcohol dependence for a twelve-week programme (Patten 2002). We have also replicated the authors' analyses for the subgroup of participants with a history of MDD.

We have placed the sixth study (Smith 2001) in a separate subgroup from the other trials because although cognitive-behavioural intervention was based on that used by Hall and colleagues, and we treat it here as the active intervention, the authors hypothesized that the supportive-motivational treatment would be the more effective for smokers who were at risk of relapse due to poor mood. Also, unlike the other studies in this group, neither programme was offered until a week after the target quit day. The two alternatives, skills training for managing negative affect, or motivational interviewing, were compared as adjuncts to nicotine patch therapy and brief individual counselling.

## 2.3. Manipulation of Group Dynamics

Some of the studies already described will have had differences in group processes arising from the emphasis on skills or on discussion, but three studies specifically focused on manipulating the group dynamics. Digiusto 1995 compared a group programme which emphasized social support with one emphasizing self control. The organization of the groups differed, with the first emphasizing contact with other participants, the other using a didactic format and discouraging contact with other attendees. However other components were also varied, for example skills training instruction was given only in the self-control group. The study hy-

pothesis was that the treatments would show differential treatment effect with smokers of different personality types. Etringer 1984 and Lando 1991 manipulated the group environment in a less extreme way. Their programmes were intensive, lasting for 16 sessions over nine weeks. In an 'enriched cohesiveness' intervention, exercises focusing on the importance of self disclosure and feedback to other group members were introduced to facilitate positive group interaction. Etringer and colleagues also compared a programme which included a satiation smoking procedure, with one using nicotine fading. Their hypothesis was that group cohesiveness was already developed by the aversive smoking routine, so that the cohesiveness manipulation would be most effective in combination with nicotine fading. The two alternatives were therefore separately entered into the analysis (Etringer 1984; Etringer 1984 Fading).

## 2.4. Miscellaneous Other:

A small number of other studies do not fit within the broad comparisons above, either because they compared multiple different conditions, or because they did not use interventions comparable to other studies. They do not contribute substantially to the conclusions drawn in the review. George 2000 used a programme developed to help smokers with schizophrenia and compared it to a standard programme. Two studies compared different procedures for altering smoking behaviour before the quit day. Brown 1984 compared a seven-session programme with and without the use of a nicotine fading strategy. Although nicotine fading (changing brands to lower nicotine rated ones) is a relatively common component of programmes, this is the only study we identified which tested the procedure. Cinciripini 1995 compared four different pre-cessation procedures manipulating the amount and timing of smoking. McGovern 1991 compared two different methods of nicotine fading, changing brands versus using graduated filters. Glasgow 1989 compared two six-week programmes, one emphasizing total abstinence, the other giving participants the option of cutting down their cigarette consumption if quitting was too difficult. Ward 2001 added a cognitive counter-conditioning (CCC) component to a four-session programme which also included instruction in the use of nicotine replacement therapy, and discussion of the concepts of self efficacy and the stages of change. In the CCC component participants jointly developed negative schema about smoking which they were to rehearse mentally whenever they had a cigarette.

Lando 1990 compared three programmes; the American Cancer Society *Freshstart*, the American Lung Association (ALA) *Freedom from Smoking* and a laboratory-derived clinic approach. Bushnell 1997 compared *Freshstart* with a more intensive, small-group approach. Glasgow 1981 compared three different group programmes, two based on social learning programmes developed by Pomerleau & Pomerleau, and Danaher & Lichtenstein, and the simpler *I Quit Kit* intended to control for the non-specific effects of a group programme. All groups had the same schedule of eight meetings. There were small numbers in each. The results of these

two studies are described in the results section, but not displayed in the summary meta-analysis tables. Garcia 2000 compared a ten-session and a five-session programme, each using the same components.

## METHODOLOGICAL QUALITY

Most trials gave insufficient detail to be sure that randomization was effective and that the experimenter did not know which treatment a participant would receive before enrolling them. In cases where more than one group method was being compared, and recruitment was continuous, participants were generally allocated to treatment groups on the basis of their sequence of arrival. The group was then randomized to treatment. In studies in which randomization was individual, randomization schedules were in some cases reported to be interrupted in order to allocate families or friends to the same group. Both these features mean that people in a particular group may be more similar than would be expected by chance. This undermines the statistical assumption used to estimate the variance, which is that they are typical of the population as a whole. The same principle also applies when patients are treated in groups, because each person's chance of success may be influenced by the group in which they find themselves. The possibility that success rates varied beyond chance between the groups given the same treatment can be tested, but the power to detect these differences will generally be very low. All these features of group therapy trials are likely to lead to an underestimate of the true variance, and therefore to the estimation of confidence intervals which are too narrow. In those trials which randomized entire worksites to programme type this factor is even more relevant.

The small number of trials in any comparison and the fact that studies of the same type tend to share the same shortcomings meant that sensitivity analyses based on any quality assessment were impractical.

Early post-randomization drop-outs were not always identified by treatment group. Where the information was available we have generally included them to base the analysis on the numbers randomized. Since the assumption made about drop-outs, that they are continuing smokers, is the same whatever their treatment group, measures of relative effect will only be altered greatly if there is differential drop-out. If drop-out rates are higher in a minimal treatment control group, then the relative effectiveness of the treatment group may be inflated. We have noted in the Table of Included Studies if there were substantial differences between the numbers randomized and those followed up. In one study the numbers followed up were so much lower than the numbers randomized that we have used the numbers followed up, but report also the effect of using numbers randomized (Gruder 1993).

Eleven studies (Camarelles 2002; Cottraux 1983; DePaul 1987; Etringer 1984; Grant 2003; Gruder 1993; Leung 1991; McGovern 1991; Minthorn-Biggs 2000; Pederson 1981; Powell 1981)

did not report any use of biochemical validation of self-reported smoking cessation. Some other studies used a mixture of biochemical measures and verification by family or colleagues, or only sought biochemical verification in a random sample of quitters, or used biochemical validation only during the treatment period and not at longer term follow up. Where only a sample of quitters was verified it was not always clear whether overall quit rates were corrected for the disconfirmation rate in the sample. One study (Glasgow 1981) gave self-reported quit rates and quitting as measured by carbon monoxide (CO) separately. In most arms the self-reported rate was lower, so we have used this measure. In the only arm where the CO validated rate was more conservative, self-reported rates favour self help over group treatment so is still conservative with respect to the hypothesis of the review.

Most studies followed participants for 12 months. A small number (Bushnell 1997; Camarelles 2002; Digiusto 1995; George 2000; Glasgow 1981; Glasgow 1989; Goldstein 1989; Jorenby 1995; Leung 1991; Minthorn-Biggs 2000; Pederson 1981; Rabkin 1984; Sawicki 1993) had only six months follow up. Of the studies with one-year follow up 20 reported an outcome requiring a sustained period of cessation. (DePaul 1987; DePaul 1989; DePaul 1994; Ginsberg 1992; Gruder 1993; Hall 2002; Hollis 1993; and Nevid 1997 with non-group controls and Brown 2001; Cinciripini 1995; Hall 1994; Hall 1996; Hall 1998; Lando 1990; Lando 1991; McGovern 1991; Patten 2002; Razavi 1999; Stevens 1989; Zelman 1992 with between-group comparisons). Since not all of these reported the use of biochemical validation at longest follow up there were only 11 studies with one-year sustained and validated quit rates (Brown 2001; DePaul 1989; DePaul 1994; Hall 1994, Hall 1996, Hall 1998, Hall 2002; Hollis 1993; Nevid 1997; Patten 2002; Stevens 1989).

## RESULTS

### 1.1. COMPARISON OF GROUP AND SELF-HELP PROGRAMMES

This comparison included more than 4,000 participants from 13 studies. Pooling eight studies which compared a group therapy programme with provision of the same content via a self-help manual alone gives an estimated odds ratio (OR) for the effectiveness of the addition of group meetings of 2.64 (95% confidence interval (CI) 1.89 to 3.69). Including the other five studies which used different programmes for the group and self-help formats reduced the OR to 1.97 (95% CI 1.57 to 2.48). There was no significant heterogeneity in these results ( $I^2 = 6\%$ ). Four of the studies (Gruder 1993; DePaul 1987; DePaul 1989; DePaul 1994) were carried out during a televised smoking cessation series which all participants were encouraged to watch. The three DePaul studies also took place in workplace settings with workplaces rather than individuals randomized to condition. Statistically therefore their results may be less precise. When these studies were excluded, the

OR for all other studies with the same or different programmes was 1.69 (95% CI 1.26 to 2.25) (data not displayed). The result is therefore robust whether or not workplace trials using cluster-randomization, or studies using group programmes as adjuncts to mass media interventions were included. A sensitivity analysis using numbers randomized rather than numbers followed up in Gruder 1993 also had no effect on the results. Using only the studies with 12-month sustained and validated quit rates also left conclusions unchanged.

### 1.2. COMPARISON OF GROUP AND INDIVIDUAL THERAPY

Although there was some clinical heterogeneity in the precise details of the interventions and controls compared, there was no evidence of statistical heterogeneity between the five trials in this category ( $I^2 = 33\%$ ), so we have calculated a pooled estimate. This did not detect evidence of a significant difference (OR 0.86, 95% CI 0.66 to 1.12). The three trials where the individual intervention involved fewer sessions than the group programme (which might be expected to favour the group condition) tended to show lower quit rates in the group condition (Camarelles 2002; Jorenby 1995; Smith 2001) (OR 0.79, 95% CI 0.60 to 1.06). In three of the trials (Garcia 1989; Jorenby 1995; Smith 2001), nicotine replacement therapy (NRT) was offered to all participants, and in one other (Camarelles 2002) about half of the participants used NRT. It is possible that when pharmacotherapy is being used, small differences in type and amount of behavioural support may not affect long-term success. In one trial where quit rates were 4% lower in the group condition (Smith 2001), the group programme was not provided until after quit day. This contrasts with typical programmes which start before the quit attempt is made, and may not provided the best test of the intervention.

### 1.3. COMPARISON OF GROUP THERAPY WITH OTHER TREATMENTS

#### Physician or nurse advice

There was statistical heterogeneity between the results of the seven studies ( $I^2 = 76\%$ ), so no pooled effect is calculated. Of the five trials only Hollis 1993 and Bakkevig 2000 found a statistically significant superiority of the addition of a group programme compared to advice from a healthcare provider and a pamphlet; one showed a non-significant trend towards a benefit (Hall 2002). One trial (McDowell 1985) reported little difference, whilst three trials (Cottraux 1983; Rice 1994; Sawicki 1993) found trends towards greater efficacy of the advice intervention.

#### Health Education

Rabkin 1984 found similar cessation rates for a full group programme compared to an intervention with a single session of health education and one individual counselling session.

### 1.4. COMPARISON OF GROUP THERAPY PLUS NRT WITH NRT ALONE

Neither Ginsberg 1992 nor Jorenby 1995 found a significant difference between quit rates in a group programme compared to

the control groups when both interventions included provision of NRT. In both studies the control intervention included other elements which could have contributed to cessation success.

### 1.5. GROUP PROGRAMMES COMPARED TO 'NO INTERVENTION' CONTROLS

This comparison included seven trials with a total of 815 participants. Six had higher quit rates with group programmes compared to a no-intervention or a minimal contact control. Heterogeneity was moderate to low ( $I^2 = 42\%$ ) and the combined OR was 2.17 (95% CI 1.37 to 3.45, Comparison 1.5).

### COMPARISONS BETWEEN DIFFERENT FORMATS OF GROUP PROGRAMME

#### 2.1. Relapse Prevention/ Skills Training/ Cognitive-Behavioural components (Comparison 2.1)

Eight studies (Becona 1997; Brown 1984; Curry (RP) 1988; Davis 1986; Goldstein 1989; Hall 1984; Stevens 1989; Zelman 1992) compared programmes that added components such as skills training or cognitive-behavioural therapies to control programmes of the same duration. They provide some evidence for a benefit of more complex interventions (OR 1.36, 95% CI 1.03 to 1.79). This needs to be interpreted cautiously. A total of over 900 people are included in the meta-analysis, but four of the studies were small. Four had over 100 participants, and the study by Stevens and Hollis (Stevens 1989), with almost 400, contributes much of the weight. Without this study the confidence intervals would no longer exclude no benefit (OR 1.36, 95% CI 0.94 to 1.98). Only one trial (Goldstein 1989) showed a statistically significant benefit at long-term follow up. There was no evidence for heterogeneity between study outcomes ( $I^2 = 5.8\%$ ). Pooling the six studies (Hall 1985; Hall 1987; Killen 1984; Lando 1985; Minthorn-Biggs 2000; Powell 1981) in which additional components were confounded with longer programme length, suggested even less evidence of a benefit. (OR 1.19, 95% CI 0.79 to 1.79). These were also small studies, the largest contributing 139 people to the analysis. Combining all fourteen trials suggests a possible small benefit from more complex programmes (OR 1.30, 95% CI 1.04 to 1.64, not displayed in graphs).

The results of this meta-analysis are sensitive to the way in which Stevens 1989 is treated, and this trial also differs from the others in the comparison, because only smokers who had quit smoking following an intensive four-day group course were randomized, 79% of the total. This gives it increased power to detect an effect of the relapse prevention interventions, but limits the generalizability to smokers who do not quit initially. The sustained quit rate for the people who received three relapse prevention sessions with coping skills rehearsal was 41%, compared to 35% for those who only had discussion at the relapse prevention sessions, and 33% who had no additional sessions. This suggests that the specific components were more helpful than just the additional contact. If both the interventions for relapse prevention are combined and compared to the shorter programme as the control in the meta-analyses, the

pooled effect suggests a smaller and less certain effect of additional intervention.

### 2.2. Mood Management components (Comparison 2.2)

None of the trials (Hall 1994, Hall 1998, Brown 2001, Hall 1996, Patten 1998, Smith 2001) using specific interventions to help manage mood showed significant long term benefits. Pooling them also failed to show evidence of an effect (OR 1.06, 95% CI 0.81 to 1.40). Exclusion of Smith 2001, which differed in various ways, did not change this result. In this study mood management produced similar quit rates to motivational interviewing, when offered after participants has attempted to quit. In the other studies the authors' hypothesis was that these interventions would differentially benefit people with a history of major depressive disorder (MDD), so we pooled the results for this subgroup of participants. For those with a history of MDD there was still no evidence of benefit (Comparison 2.3, OR 1.35, 95% CI 0.78 to 2.33). This result was sensitive to the inclusion of one study in which all participants in one study were MDD history positive (Brown 2001). A post hoc subgroup analysis by the authors suggested that in this case it was the subgroup with multiple episodes of MDD who benefited most from the enhanced treatment. The result of this trial was also sensitive to whether point prevalence quit rates (the primary outcome for the trial) or sustained abstinence (used here) are used.

### 2.3. Manipulation of Group Dynamics (Comparison 2.4)

There was no evidence from the three trials (Digiusto 1995; Etringer 1984; Lando 1991) that outcome had been affected by attempts to change the interaction between participants in a group programme (OR 1.22, 95% CI 0.84 to 1.77).

### 2.4. Other miscellaneous comparisons (Comparison 2.5)

The trials briefly noted here were mostly small and did not show significant long-term effects on cessation, although all had wide confidence intervals. George 2000 failed to show evidence that a programme designed for smokers with schizophrenia had a greater benefit than a standard intervention (OR 1.79, 95% CI 0.32 to 10.06). Glasgow 1989 found no difference in six-month quit rates using programmes differing in their emphasis on abstinence or controlled smoking (OR 0.93, 95% CI 0.25 to 3.41). Brown 1984 showed no significant benefit from nicotine fading, with only 31 people (OR 3.23, 95% CI 0.30 to 35.11). McGovern 1991 showed no significant difference between nicotine fading with graduated filters compared to brand switching (OR 1.22, 95% CI 0.40 to 3.07). Ward 2001 demonstrated no significant difference between the programmes although the direction favoured the one using the counter-conditioning component (OR 1.99, 95% CI 0.60 to 6.62).

Comparisons between multiple programmes (not shown in graphs)

Lando 1990 found that the American Lung Association (ALA) *Freedom from Smoking* programme was more successful than the American Cancer Society (ACS) *Freshstart* programme. Sustained

one-year quit rates were 12%, 19% and 22% for the ACS, ALA and clinic-derived programme respectively. This was a large, multi-centre study, and since treatment was allocated by group the authors estimated the design effect to allow for the correlation in outcome between people treated together. The corrected chi squared for the three-way comparison was significant ( $P < 0.014$ ) for the one-year sustained abstinence measure. The difference between the ALA and Lando programme was not significant at one year. Bushnell 1997 compared *Freshstart* to a more intensive clinic-based approach. This study did not show significant long-term differences between the programmes, though early results favoured the intensive approach. Glasgow 1981 also compared three different programmes. They found no significant differences but numbers allocated to each programme were small. In Garcia 2000 a five-week 10-session programme was associated with lower 12-month quit rates than a five-session programme (16% versus 38.7%). The rates for the more intensive programme were significantly lower when compared to a five-session programme combined with a self-help manual (16% vs 48%,  $P < 0.05$ ).

### TAKE-UP RATES FOR GROUP PROGRAMMES.

The variation in take-up rates for group therapy was partly determined by the method of recruitment and randomization. However even in trials where eligible smokers agreed to attend group meetings prior to randomization the non-participation rate was often high. Curry and colleagues (Curry (AA) 1988; Curry (RP) 1988) enrolled participants who attended an information meeting. More group participants (88%) than self-help participants (59%) began treatment (defined as completing the first week of self monitoring), and completed treatment. Because of the differential drop-out the difference in quit rates is greater when an intention-to-treat analysis (including all randomized participants) is used than when only those who began treatment are included. Participation in the Glasgow 1981 trial was higher, with almost all those enrolled taking part and available for six-month follow up.

Attrition following randomization was particularly high in Gruder 1993 which was carried out in conjunction with a television programme, because eligible smokers who had registered by mail for support materials were randomized before they were contacted. Only 70% could be reached and 62% scheduled for group meetings. Non-participation at this stage was due to lack of interest or problems with timing or location of meetings. Of those who were scheduled 50% then failed to attend any meetings.

Rice 1994 also had a high non-attendance rate even though participants were volunteers. Overall 34% dropped out of the trial on learning their treatment allocation. Thirty-one per cent of those randomized to the group treatment refused to participate, whilst the drop-out from the follow-up only group was 48%. Cottraux 1983 reported that just over half those enrolled attended all three behaviour therapy sessions. Hilleman 1993 do not report any drop out from group treatment, but this trial involved volunteers for a drug trial, and is probably not typical. The lowest participation

rate was seen in Hollis 1993. This trial recruited smokers during visits to primary care offices. Of those randomized for referral to a group programme 11% chose to attend, whilst of those given a choice of self help or groups just 8% attended a group programme. A higher take-up rate was seen in a Norwegian trial (Bakkevig 2000) which allocated community volunteers to either a smoking cessation group, which 75% attended, or to visit their physician for help (GP) which only 36% chose to do. In one study not included because the intervention offered nicotine replacement therapy as well as referral to a behavioural programme as a covered benefit in a health plan, only 1.2% of the intervention group participated in a behavioural programme (Schauffler 2001).

## DISCUSSION

Several problems of conducting a systematic review of behavioural interventions should be noted. First, many trials of behavioural interventions use multiple treatment arms in an attempt to identify the precise therapeutic element leading to success. This makes the pre-definition of explicit comparison groups difficult. Second, as with all behavioural as opposed to pharmacological therapies, the choice of an appropriate control condition presents problems when evaluating efficacy. There is no obvious equivalent for the drug placebo to control for the non-specific effects of a treatment method. Evaluating group therapies against a waiting list control does not provide very good evidence for the specific effect of the group format. A limitation of research in which participants are treated in groups is that typically there may be only two or three groups in each treatment condition. Participants' chances of success are almost certainly not completely independent. There may be variation by the group in which they were treated, due to aspects of the group process. This aspect is generally ignored in trial analyses. We also cannot exclude the possibility of publication bias. Although group programmes have been widely offered for smoking cessation, often under the auspices of cancer prevention or lung health charities, we found relatively few studies meeting our criteria. It is possible that there are other published or unpublished studies we have not located.

The results of the meta-analysis provide evidence that providing group therapy rather than self-help materials alone can increase long-term quit rates. There is some indication that group programmes are more likely to improve quit rates compared to structured self-help programmes when they are used alongside other components such as mass media or worksite initiatives.

The results from five studies provide no evidence that group therapy is more effective than individual counselling, whether or not the number of sessions was matched. There was therefore a lack of evidence that meeting with a group of other smokers was a critical element in an intensive smoking cessation programme. In three of the trials (Garcia 1989; Jorenby 1995; Smith 2001), nicotine replacement therapy (NRT) was offered to all participants, and in

one other (Camarelles 2002) about half of the participants used NRT. The overall increase in success rates attributable to pharmacotherapy might make small relative differences due to the type and amount of behavioural support more difficult to detect. In one of these trials there was no significant benefit from either of two group therapy programmes as adjuncts to brief individual counselling. A plausible explanation for this result is that the programmes were not initiated until a week after the planned quit date, which may have been too late to benefit smokers who had not managed to quit or were at risk of relapse (Smith 2001).

Although we did not specifically seek cost data, none of these studies was designed to compare the costs of different formats. Using a group format ought to allow more people to be treated by a therapist, and therefore could be more cost-effective if outcomes are similar, but there is not enough evidence about comparative efficacy.

The effectiveness of group treatment compared to brief advice is complicated by heterogeneity. One trial (Hollis 1993) in which both sets of smokers received advice showed a benefit of additional referral to a group. However the quit rate in the therapy group was still less than 6%, so the additional benefit of the group component was limited. The other trial (Rice 1994) in which a control group also received brief advice from a nurse produced higher quit rates in that arm than from more intensive individual or group treatment. The authors consider that the explanation for this was the presence in the 'no intervention' group of a disproportionate number of coronary artery bypass graft patients who were thought likely to have a greater motivation to quit. Of the two other trials which showed a trend to greater efficacy of physician advice, Cottraux 1983 was possibly atypical, in that the role of the physician was to recommend the use of lactose tablets. There was also no validation of self-reported non-smoking in this trial, which may have led to the relatively high quit rates, and hence the weight given to the trial in the meta-analysis.

There was no evidence, based on two trials, that group therapy as an adjunct to nicotine replacement therapy significantly increased quit rates over NRT alone. In both studies the comparison arm had some behavioural support - two meetings and materials in the case of Ginsberg 1992, and eight weekly assessment sessions in the case of Jorenby 1995. Once again the evidence is too limited to draw substantial conclusions. As suggested above, the use of pharmacotherapy may make it difficult to detect differences between the effects of behavioural components, if the relative increase in quit rates is small. The updated Cochrane review of individual counselling has noted a similar failure to detect a significant additional benefit of individual counselling when added to the systematic use of NRT (Lancaster 2005). In both cases evidence comes from a small number of trials (Jorenby 1995 contributes data to both reviews). In the absence of clear evidence to the contrary, it seems reasonable to assume that behavioural interventions and

pharmacotherapies independently contribute to successful quitting.

Comparison of group therapy with a control group offered no intervention supports the conclusion that group programmes can aid smoking cessation, although it does not provide evidence for a specific benefit from the group therapy.

This review has taken a broad approach to group programmes, without distinguishing between treatments on the basis of their theoretical approach, therapists or intensity. There is still limited evidence from which to identify those elements of group therapy which are most important for success. In the main analyses there are too few studies to compare subgroups of studies according to content, provider or length. The number of studies directly comparing different programmes is also small, although now that group therapy is well established as a treatment, more effort is being devoted to optimizing interventions. Recently published studies add relapse prevention sessions or compare programmes using different theoretical approaches. Most commonly, they distinguish between approaches which stress the acquisition of specific skills, and those which aim to increase motivation and confidence in quitting without emphasis on cognitive and behavioural skills, (e.g. Brown 2001; Hall 1998; Smith 2001; Zelman 1992 for comparisons between approaches). At the moment the evidence supporting the use of additional skill-based components is weak, although it is consistent with the US guideline meta-analyses discussed below. Although pooled odds ratios suggest a small benefit, confidence intervals are sensitive to the studies included and the way interventions are categorized. A further focus of current research is to identify whether specific subgroups of smokers benefit differentially. This could allow tailoring of intensive interventions for specific target groups, for example people with histories of depression or other addictions, or with smoking-related medical problems (Brandon 2001). Research addressing these questions is likely to contribute more to future updates of these reviews. At the moment there is not sufficient evidence to support using one programme type over another for smokers with any particular characteristics. Some studies in this category tested relapse prevention interventions. Most of these studies are also included in a Cochrane review on relapse prevention which includes studies of relapse prevention interventions in non-group formats and in a range of settings (Hajek 2005). In that review no evidence was detected of proven effective approaches for reducing relapse rates at long-term follow up.

The US Public Health Service Guideline, *Treating Tobacco Use & Dependence* (Fiore 2000), is based on meta-analyses using logistic regression. This approach allows the contribution of data from trials which did not directly compare different formats. The guideline includes estimates of the comparative cessation rates using different formats for delivering interventions. In the Guideline analysis, the estimated odds ratio (OR) for success using group counselling compared to no intervention was 1.3 (95% confi-

dence interval (CI) 1.1 to 1.6, Table 17). In the earlier version of the guideline the estimated benefit of group therapy was somewhat larger (Fiore 1996). Another Guideline meta-analysis considered the components provided within group and individual counselling programmes. This suggested that general problem-solving elements (including skills training, relapse prevention and stress management) were likely to be beneficial (OR 1.5, 95% CI 1.3 to 1.8, Table 20). Intra-treatment social support (OR 1.3, 95% CI 1.1 to 1.6) and extra-treatment social support (OR 1.5, 95% CI 1.1 to 2.1) were also likely to be useful components. The analysis did not show relaxation exercises, contingency contracting, cigarette fading or negative affect components to be useful. The Guideline authors stress that the strength of evidence underlying recommendations regarding use of these components is not of the highest level because of the correlation of the types of counselling and behavioural therapies with other treatment characteristics such as programme length or type of therapist. The conclusions of this Cochrane review are consistent with the Guideline finding in relation to the inclusion of general problem-solving components, and are strengthened by being limited to unconfounded comparisons. They are still limited by the small number of studies and the heterogeneity of approaches.

There is further evidence from studies which did not meet our inclusion criteria that group programmes are effective. The Lung Health Study (Kanner 1996) was a trial of a smoking intervention and a bronchodilator in smokers with mild pulmonary obstructive disease. The programme consisted of 12 weeks of group therapy with a cognitive-behavioural approach, and nicotine gum was available to all participants. In addition they all received a strong physician message about quitting followed by a meeting with a smoking intervention specialist. A maintenance programme was also provided. We excluded the study from our meta-analysis because the effect of the group was confounded by the effects of nicotine replacement. However the quit rate achieved is greater than might be expected from the use of NRT alone and it is reasonable to assume that the group programme contributed to the effect. Twenty-two per cent of the intervention participants achieved smoking cessation for five years compared to 5% of the usual care control group. Nine-year follow up of a cohort of people treated in large group-format community-based interventions suggests a quit rate somewhere between 16% and 48% depending on the extent to which the 34% of the cohort reached were representative of those treated (Carlson 2000). More recent results based on longer follow up report a difference in health outcomes between the intervention groups (Anthonisen 2005).

The drawback to group programmes as a public health strategy is their limited reach to the smoking population. Participation rates in a number of the studies considered here were low. Participating smokers need to be sufficiently motivated not only to attempt to stop, but also to commit themselves to the time and effort involved in attending meetings.

## AUTHORS' CONCLUSIONS

### Implications for practice

There is reasonable evidence that groups are better than self help, and other less intensive interventions, in helping people stop smoking, although they may be no better than advice from a healthcare provider. There is not enough evidence to determine how effective they are in comparison to intensive individual counselling. From the point of view of the consumer who is motivated to make a quit attempt it is probably worth joining a group if one is available - it will increase the likelihood of quitting. Group therapy may also be valuable as part of a comprehensive intervention which includes nicotine replacement therapy (NRT).

From the public health perspective, the impact of groups on smoking prevalence will depend on their uptake. Providers need to make a judgement about the cost effectiveness of the gains achieved by group therapy compared to other interventions.

### Implications for research

The general efficacy of multi-component programmes which include problem-solving and social support elements has been established. Demonstrating the efficacy of specific components or procedures requires large sample sizes, which, given the difficulty of attracting smokers to intensive programmes, can be difficult to

achieve. Identifying subgroups of smokers who are differentially helped by particular components may be possible, and this could lead to the development of targeted interventions.

## POTENTIAL CONFLICT OF INTEREST

None known.

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\* Indicates the major publication for the study

## TABLES

### Characteristics of included studies

Study	<b>Bakkevig 2000</b>
Methods	Country: Norway Recruitment: Community volunteers Randomization: method not described Group size: not stated
Participants	139 smokers 67% female, Av. age 44, Av. cpd 19 Therapists: ex-smokers who have previously used programme
Interventions	1. Physician (GP) advice. Participants instructed to visit their GP for support. GP told to offer NRT as appropriate and provide 1 follow-up visit. 2. Group therapy, Participants asked to attend Smokenders'. 7 weekly sessions + 1 follow up 4w later. Quit day after 5w. Multifaceted including cognitive therapies
Outcomes	Abstinence 1 yr post-quit date Validation: < 83 mmol/L thiocyanate and/or < 75 ng/mL cotinine. Only 10% of group 1 and 35% of 2 attended 1 yr follow up.
Notes	'Real world' study. Treatment allocation refusers and other non-compliers included as smokers. 36% consulted GP, 75% attended Smokenders.
Allocation concealment	B – Unclear

Study	<b>Batra 1994</b>
Methods	Country: Germany Recruitment: Community volunteers Randomization: method not stated Group size: not stated
Participants	232 smokers 53% female, av age 41, Av cpd 25
Interventions	Both conditions received nicotine patch 1. Group therapy, 9 weekly 90 min sessions 2. Self help
Outcomes	Continuous abstinence at 12m Validation: not described
Notes	
Allocation concealment	B – Unclear

Study	<b>Becona 1997</b>
Methods	Country: Spain Recruitment: Community volunteers Randomization: method not stated Group size: 36-40
Participants	76 smokers, >= 10/day (untreated control group of 40 not randomly selected) 51% female, av age 34, Av cpd 28

## Characteristics of included studies (Continued)

	Therapists: 2 experienced therapists
Interventions	Both conditions received 8 weekly sessions, TQD week 4. 1. Standard programme including motivational contract, nicotine fading, stimulus control 2. Relapse prevention. As 1 + problem solving.
Outcomes	Abstinence at 12m Validation: CO < 8ppm during therapy, informants during follow up
Notes	No non-group control 2 vs 1 - effect of skills/RP
Allocation concealment	B – Unclear

### Study **Brown 1984**

Methods	Country: USA Recruitment: Community volunteers Randomization: method not stated Group size: approx 7-8
Participants	46 smokers 48% female, Av. age 35, av. cpd 26 Therapists: 2 teams of co-counsellors, each conducted 1 group in each condition
Interventions	All conditions received 7 x 1hr weekly sessions, TQD week 4, focus on self-management strategies, group cohesion and support 1. Nicotine fading and RP components 2. Nicotine fading alone 3. RP alone
Outcomes	Abstinence at 12m Validation: none at 12m, CO only used at post-treatment
Notes	No non-group control 1 vs 3 - effect of nicotine fading 1 vs 2 - effect of skills/RP
Allocation concealment	B – Unclear

### Study **Brown 2001**

Methods	Country: USA Recruitment: Community volunteers Randomization: stratified on gender, current depressive symptoms, FTQ, using urn method randomization Group size: not stated
Participants	179 smokers with history of MDD 60% female, Av. age 45, av. cpd 27 Therapists: 2 for each group, clinical psychologists
Interventions	1. Standard group therapy. 8 x2hrs over 6w, TQD session 5. Including nicotine fading, RP, homework 2. As 1. + CBT for depression. Same schedule + coping skills to control depressive symptoms
Outcomes	Sustained abstinence at 12m (confirmed at post-Rx, 1, 6m). (PP abstinence was main trial outcome) Validation: CO <= 10ppm + saliva cotinine <= 46ng/ml (abstinence was only verified by significant others in 6.5% of cases)
Notes	No non-group control 2 vs 1 - effect of mood management programme. Direction of effect opposite for sustained and PP abstinence.
Allocation concealment	A – Adequate

**Characteristics of included studies (Continued)**

<b>Study</b>	<b>Bushnell 1997</b>
Methods	Country: USA Recruitment: Community volunteers Randomization: method not stated, stratified by military or civilian Group size: max 50 American Cancer Society (ACS) or 15 Vanderbilt University Medical Center (VUMC)
Participants	314 military and civilian smokers Excludes 198 people, assignment NS, who did not attend any sessions after randomization 44% female, age and smoking not described Therapists: ACS- trained volunteers. VUMC- healthcare professionals
Interventions	All participants offered free NRT (in group 2 conditional on attending 75% classes) 1. ACS: 4 x1hr large group sessions, no TQD 2. VUMC: 8 x1hr sessions, RP model incl stress management, diet, exercise
Outcomes	Abstinence at 6m (PP) Validation: CO < 8ppm, salivary cotinine <= 10mg/ml
Notes	No non-group control Results not shown in graphs. No sig diff in 6m quit ,12% (17/143) for ACS vs 13% (22/171) for VUMC. Take up rate: 61% of screened population attended 1 or more classes.
Allocation concealment	B – Unclear
<b>Study</b>	<b>Camarelles 2002</b>
Methods	Country: USA Recruitment: Primary care Randomization: sealed opaque envelopes Group size: 10-14
Participants	106 smokers 54% female, av. age 47, av. cpd 25 Therapists: 1 doctor, 3 nurses, trained and experienced
Interventions	72 participants eligible for nicotine patch, 53 used. 1. Group therapy, 7 x2 hrs over 3w, TQD after 3rd. 2. Individual counselling, not matched for intensity, 2 sessions over 2w, with S-H materials
Outcomes	Sustained abstinence at 6m Validation: none
Notes	New for 2005 update. Comparison between group and individual therapy Slightly higher and longer use of NRT in group condition
Allocation concealment	A – Adequate
<b>Study</b>	<b>Cottraux 1983</b>
Methods	Country: France Recruitment: Media advertizing Randomization: no details, stratified by presence of another smoker in household
Participants	558 (418 in arms of interest) community volunteers Av. cpd 31
Interventions	1. Behaviour therapy. Includes discussion, training in relaxation. Groups of 15 with two therapists (qualifications not described). 3 x3hr sessions over two weeks. Given relaxation and stress-desensitization audiotape for daily use. 2. Acupuncture

**Characteristics of included studies (Continued)**

	3. Placebo - lactose capsules for 2w. Met 2 x10min with a doctor. 4. 1 yr waiting list control.
Outcomes	Abstinence at 12m, assessor blind to treatment condition Validation: none
Notes	Although 3. described by authors as placebo the two meetings with a doctor make it more comparable with an advice intervention so 1 vs 3 used in Group vs physician advice.
Allocation concealment	B – Unclear

**Study Curry (AA) 1988**

Methods	Same study as Curry (RP) 1988 Dummy study used to enter results for comparison of 'Absolute Abstinence' Group vs self-help delivery.
Participants	
Interventions	
Outcomes	
Notes	
Allocation concealment	B – Unclear

**Study Curry (RP) 1988**

Methods	Country: USA Recruitment: media advertising Randomization: Part by coin toss and part random number table. More assigned to S-H than group. Friends co-randomized to same programme but not necessarily same format.
Participants	139 community volunteers Therapists: 2 teams of 2 PhD psychologists. Each team led 1 group in each programme.
Interventions	Test of group vs S-H format, and traditional vs relapse prevention programme. Groups met for 8 x 2hr weekly meetings which included relaxation training, enlisting social support and practising alternative behaviours. 1. Relapse prevention Group. Focused on smoking as learned behaviour. Quit day at 3rd session. Additional elements included identifying high risk situations, cognitive restructuring and role playing. 2. Relapse Prevention Self help. 8 workbook units. 3. 'Absolute Abstinence' (AA) Group. Focused on addictive component of smoking. Quit day at 5th session. Additional elements included focused smoking, health education and contingency contract. 4. Absolute Abstinence Self help. 8 workbook units.
Outcomes	Abstinence from months 9 to 12 of follow up. Validation: saliva thiocyanate and 2 collateral verifiers.
Notes	Results include all assigned to treatment; only 69% began treatment. 1. vs 2. and 3 vs 4. [in graph as Curry (AA)] contribute to evaluation of delivery format. 1 vs 3 RP
Allocation concealment	B – Unclear

**Study Davis 1986**

Methods	Country: USA Recruitment: not specified Randomization: Groups randomized to treatments Group size 3 to 8.
Participants	45 smokers who completed treatment (5 who dropped out before 1st meeting, 5 who dropped out after 1 session and 1 after 2 sessions not included in the results).

### Characteristics of included studies (Continued)

	Therapists: 9 advanced clinical psychology graduate students with no previous experience. Each conducted 1 group.
Interventions	All conditions received 6 x weekly 1.5-2hr meetings based on Pomerleau & Pomerleau broad spectrum cessation package. 1. 'Control' using Pomerleau & Pomerleau alone 2. 'Enhanced control' added discussion of 11 problem situations 3. 'Experimental' condition added active cognitive behavioral skills training focusing on same problem situations.
Outcomes	Abstinence (PP) at 12m follow up CO validation.
Notes	No non-group control 3. vs 1 RP Condition 2 not displayed. 3/14 quit
Allocation concealment	B – Unclear

#### Study DePaul 1987

Methods	Country: USA Recruitment: Employees at 43 worksites, recruited prior to a 3w television smoking cessation programme. Randomization: Cluster randomization by worksite, matched for size
Participants	233 smokers in group discussion worksites, 192 in non-group worksites
Interventions	All participants were given S-H manuals by company co-ordinators and instructed to view the televised segments 1. Twice weekly group meetings 2. S-H alone
Outcomes	Abstinence at 12m (multiple PP) No validation
Notes	Percentage quit rates taken from graphs and denominator assumed to be numbers followed up.
Allocation concealment	B – Unclear

#### Study DePaul 1989

Methods	Country: USA Recruitment: Employees at 38 worksites, recruited prior to a 3w television smoking cessation programme. Randomization: Cluster randomization by worksite
Participants	419 smokers who participated in the worksite programmes.
Interventions	1. 6 x twice-weekly group meetings to coincide with the 3w television series, then monthly meetings for 1 yr. Abstinent smokers and 5 of their family and 5 co-workers entered for a lottery at the final group meeting and 12m follow up. 2. S-H manuals only
Outcomes	Abstinence from end of programme to 12m Validation by saliva cotinine and co-worker or relative confirmation.
Notes	Data based on participants in the programmes. Attrition was defined as not attending any group meetings, not reading the manual, not being located for post-testing, refusing to be interviewed or changing jobs. The attrition rate was 17% for Group worksites and 29% for non-group worksite participants so correcting the data for attrition would increase the apparent efficacy of the group condition.
Allocation concealment	B – Unclear

#### Study DePaul 1994

Methods	Country: USA
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**Characteristics of included studies (Continued)**

	Recruitment: Employees in 61 worksites Randomization: Cluster randomization by company
Participants	564 smokers in relevant comparisons
Interventions	The worksite interventions were timed to coincide with a mass media intervention consisting of a week-long smoking cessation series on TV, and a complementary newspaper supplement. 1. S-H manual (ALA Freedom from Smoking in 20 days) 2. S-H manual and incentive payment of US\$1 for each day abstinent up to US\$175 3. 6 group meetings over 3w followed by 14 booster meetings over 6m. Incentive payments. Handouts from same S-H manual. Maintenance manual (ALA 'A Lifetime of Freedom from Smoking)
Outcomes	Sustained abstinence at 12m Validation: CO < 9ppm. Saliva cotinine at 6m only.
Notes	3 vs 2 in Group vs S-H. Treated as same S-H programme, since same approach used although group participants not given complete cessation manual.
Allocation concealment	B – Unclear

**Study Digiusto 1995**

Methods	Country: Australia Recruitment: newspaper articles and physician referral Randomization: no details
Participants	137 smokers Av. cpd 26, av age 44
Interventions	1. Social support. Emphasized interaction, social coping strategies. 5 treatment meetings of which 2 held after quit date 2. Self-control. Interaction discouraged. Taught cognitive-behavioral self-control strategies. 4 meetings, one 7 days after quit day
Outcomes	Abstinence for 7 days at 6m. No validation at 6m. (At 1w 5/82 claiming abstinence had cotinine > 250 nmol/L)
Notes	No non-group control Study designed to test specific effects of social support aspect of group treatments. Included in comparison of group programmes - effect of manipulating group dynamics.
Allocation concealment	B – Unclear

**Study Etringer 1984**

Methods	Country: USA Recruitment: advertisements Randomization: couples and friends assigned together and evenly distributed between groups.
Participants	72 community volunteers av.age 36, av cpd 25 Therapists: doctoral candidates with 2 yrs in counselling psychology
Interventions	Factorial design using 2 cessation programmes and an intervention on group cohesiveness. Not clear whether session patterns identical for each 1. Enriched cohesiveness using written commitments, exercises and video. Satiation smoking in preparation for cessation 2. Enriched cohesiveness. Nicotine fading in preparation phase 3. Standard group. Satiation smoking 4. Standard group. Nicotine fading
Outcomes	Abstinence at 1 yr

**Characteristics of included studies (Continued)**

	Validation by randomly contacting approx half of the 3 informants nominated
Notes	No non-group control 1 vs 3 and 2 vs 4 [Ettringer (fading) 1984] in comparison of group programmes - effect of manipulating group dynamics.
Allocation concealment	B – Unclear

**Study Etringer 1984 Fading**

Methods	Same study as Etringer 1984 Dummy study used to enter results for comparison of Nicotine Fading cessation Cohesive Group vs standard group.
Participants	
Interventions	
Outcomes	
Notes	
Allocation concealment	D – Not used

**Study Garcia 1989**

Methods	Country: Spain Recruitment: primary care clinic volunteers Randomization: method not stated
Participants	68 smokers (in relevant arms) 41% female, av. age 34, av. cpd 25
Interventions	1. Group therapy, 7 sessions over 3m, nicotine gum 2 mg 2. Individual counselling in clinic, same schedule as groups, nicotine gum as in 1. (A 3rd arm receiving group therapy and placebo gum is not included)
Outcomes	Sustained abstinence (quit at previous follow ups) at 6m Validation: CO < 7ppm
Notes	Included 2005 update Group vs individual counselling
Allocation concealment	B – Unclear

**Study Garcia 2000**

Methods	Country: Spain Recruitment: community volunteers Randomization: method not stated Group size: 7-16
Participants	162 volunteers for a multi-session programme, smoking > 10 cpd 52% female, Av. age 32, Av cpd 26 Therapist: Psychologist
Interventions	1. Multicomponent programme, 10x 1hr sessions over 5w 2. Multicomponent, 5x 1hrs over 5w 3. As 2 plus S-H manual 4. S-H manual, 1 orientation session
Outcomes	PP (7 day) abstinence at 12m Validation: CO < 8ppm + confirmation by informant.
Notes	1+2+3 vs 4 for effect of any group programme. 1 vs 3, effect of more intensive programme.

## Characteristics of included studies (Continued)

Drop-outs who did not attend any sessions after randomization were not included

Allocation concealment B – Unclear

### Study **George 2000**

Methods	Country: USA Recruitment: People with schizophrenic disorders Randomization: block randomization to therapy group Group size: 4-6
Participants	45 people with schizophrenia or schizo-affective disorder 67% male, av. age 40, av cpd 30
Interventions	All used 21 mg nicotine patches from quit day in week 3 1. ALA 7x 60min sessions + 3x supportive counselling 2. Special schizophrenia programme. 3x 60 min weekly sessions motivational enhancement + 7x psycho-education, social skills, RP
Outcomes	PP abstinence 6m from therapy completion Validation: CO < 10ppm
Notes	No non-group control 2 vs 1 evaluating enhanced programme in specific population
Allocation concealment	B – Unclear

### Study **Ginsberg 1992**

Methods	Country: USA Recruitment: media, flyers and word of mouth Randomization: Groups of 3-6 randomized to treatment
Participants	99 community volunteers with an acquaintance willing to participate as a support partner. Therapists: PhD psychologist or MSc health educator
Interventions	1. Nicotine gum (NG) and educational materials, 2 sessions over 2w 2. NG and behavioural programme including skill training, 5 sessions over 4w 3. NG and behavioural programme and partner support programme, 8 sessions over 5w
Outcomes	Assessment at weeks 4,12,26, 52 Outcome used: Abstinence at 52w (not clear if abstinence required at prior points) Validation by CO < 10ppm, urine cotinine < 50ng/mL. Paper states that cotinine levels failed to confirm self report in 7 people, 3 of whom were still coded as abstinent on the balance of evidence.
Notes	Intervention 1 had only 2 brief sessions so not classified as group therapy, 2+3 vs 1 used for effect of addition of group support to NG.
Allocation concealment	B – Unclear

### Study **Glasgow 1981 D+L**

Methods	Country: USA Recruitment: media advertisements Randomization: no details
Participants	88 community volunteers (85 included in analysis) Therapists: A clinical psychologist and 2 graduate students in behaviour therapy, crossed with treatment conditions.
Interventions	3x2 factorial design for treatment programme and delivery format Treatment programme: A. Danaher & Lichtenstein manual, B. Pomerleau & Pomerleau manual, C. I Quit Kit (minimum treatment control)

### Characteristics of included studies (Continued)

	Delivery format: 1. Groups of 4-6 during 8 sessions over 8w 2. Self-administered using manuals.
Outcomes	Abstinence at 6m Validation by CO < 15 ppm. At follow up self report gives lower success rates in 5/6 arms than using CO measure, so self-report data used.
Notes	Therapist-administered vs self-administered compared as separate studies (see GLASGOW P&P; GLASGO IQK) in comparison of group vs self-help format. The comparison between different programmes is not in comparison tables as no hypothesis as to which of D&L or P&P should be superior. Discussed in narrative
Allocation concealment	B – Unclear

<b>Study</b>	<b>Glasgow 1981 IQK</b>
Methods	Same study as GLASGOW 1981 D&L Dummy study used to enter results for comparison of the American Cancer Society I Quit Kit in group and self-help formats. This programme was intended by authors to be a minimal intervention, controlling for the non-specific effects of participation
Participants	
Interventions	
Outcomes	
Notes	Using self report, 2 quit in the self-help arm and none in the group, but according to CO measurements 1 person quit in each. For consistency with the other arms where self report gave more conservative numbers we have used this measure, which is most conservative in assessing the impact of the group.
Allocation concealment	B – Unclear

<b>Study</b>	<b>Glasgow 1981 P+P</b>
Methods	Same study as GLASGOW 1981 D&L Dummy study used to enter results for comparison of Pomerleau & Pomerleau programme in group and self-help formats
Participants	
Interventions	
Outcomes	
Notes	
Allocation concealment	B – Unclear

<b>Study</b>	<b>Glasgow 1989</b>
Methods	Country: USA Recruitment: media advertisements Randomization: Groups of 4-8 randomized to treatment
Participants	66 smokers av. age 40, cpd 26 Therapists: 2 research assistants. Crossed with treatments.
Interventions	Both programmes had 6 weekly meetings 1. Abstinence-based condition. Quit day at 4th session. Post-quit sessions emphasize RP. 2. Cessation-Controlled Smoking. Quitting recommended but alternative of controlled smoking offered. Quit date between sessions 4 and 5.
Outcomes	Abstinence for 7 days at 6m follow up. Validation: CO <= 9ppm. 11 people disconfirmed

## Characteristics of included studies (Continued)

Notes	No non-group control Compares difference in emphasis on abstinence. Not shown in graphs. Quit rates 5/31 vs 6/35
Allocation concealment	B – Unclear
<b>Study</b>	<b>Goldstein 1989</b>
Methods	Country: USA Recruitment: Newspaper advertisements for a clinical research study. Randomized in 2x2 factorial design 3 replications for each condition. Group size 6-13.
Participants	107 smokers Therapists: all sessions co-led by psychiatrist and clinical psychologist
Interventions	All groups met for 10 x 1hr sessions over 11w. 1. Behavioural treatment (including intensive skills training) + fixed schedule nicotine gum 2. Same as 1. but adlib schedule of gum 3. Educational group, no specific skills training, didactic presentation, non-specific group support + fixed schedule gum 4. Same as 3. + ad lib gum
Outcomes	Abstinence at 6m follow up Validation: saliva cotinine < 10ng/ml, or expired CO < 8ppm in people still using nicotine gum
Notes	No non-group control Nicotine schedule arms collapsed. 1+2 compared to 3+4 for evaluation of greater complexity of group programme. 18 Treatment drop-outs re-included in denominators.
Allocation concealment	B – Unclear
<b>Study</b>	<b>Grant 2003</b>
Methods	Country: USA Recruitment: Substance abuse treatment centre volunteers Randomization: method not stated Group size: not stated
Participants	20 alcoholic smokers 93% male, av.age 44, 77% smoked 11-30 cpd
Interventions	All participants were attending an outpatient alcohol treatment programme 1. Education & group therapy, 5 weekly sessions, 8w trial of NRT offered unless contra-indicated. 2. No formal treatment, access to standard cessation resources including NRT
Outcomes	Abstinence at 12m follow up (7 day PP) Validation: no biochemical, collateral informants at 6m only
Notes	New for 2005 Use of NRT high in both conditions, 6/20 in treatment, 10/20 in control
Allocation concealment	D – Not used
<b>Study</b>	<b>Gruder 1993</b>
Methods	Country: USA, Recruitment: Smokers registering to receive self-help materials during advance promotion of a televised cessation programme, who indicated willingness to attend group sessions and had a non-smoking buddy. Randomization: to group or no-group at time of registration. No details on method. 1205 subjects assigned to a group condition, and attempts made to contact them to schedule group meetings. Randomization between the two group conditions was by site. 26 sites offered social support condition, 24 discussion control.

### Characteristics of included studies (Continued)

Participants	1440 smokers completing a registration form and assigned to this study. Therapists: Mainly nurses and health educators randomly assigned and trained to lead either Social Support or Discussion meetings. Group size varied from 3-22, mean approx 11
Interventions	All participants sent ALA Freedom from Smoking in 20 days manual and instructed to watch TV programme. 1. Social Support. 3 x90min group meetings and copy of Quitters Guide for smokers, and 1 group meeting + Buddy Guide for buddies. Participants were instructed on how to get help from their buddies and others. Telephone calls to subjects and buddies at 1 and 2m 2. Discussion. Same schedule of meetings and phone calls as 1. but general information and review of self-help manual. 3. No-contact control
Outcomes	Multiple PP abstinence (post-intervention, 6m and 12m). 24m rates also given but substantial loss to follow up by this time so 12m rates used here. Validation attempted but abandoned due to participant refusal to provide samples.
Notes	Although group participants also scheduled to receive phone calls these occurred after the first follow up so will not have differentially affected the multiple PP quit rates Quit rates for group vs self-help comparison based on numbers assigned to group treatment who were scheduled to a meeting, and includes 'no shows'.
Allocation concealment	B – Unclear

#### Study **Hall 1984**

Methods	Country: USA Recruitment: via media adverts and referral Randomization: randomly assigned, no details
Participants	135 smokers Therapists: 2 psychologists, randomly assigned to groups
Interventions	2X2 factorial trial, aversive smoking conditions collapsed. 1. Skills training, 14 x 75 min sessions. 8 sessions over 3w involved 6 sec or 30 sec aversive smoking. 6 sessions over weeks 1-6 covered relaxation, commitment and cost benefits, and RP skills with role play of risk situations. 2. Discussion control. Same aversive smoking. other 6 sessions used self-scoring tests and group discussion. Discussion of specific skills discouraged
Outcomes	Abstinence at 12m (PP) Validation: CO < 10ppm, plasma TCN < 85ng/mg, and confirmation from 'significant other'.
Notes	No non-group control 1 vs 2, RP controlling for length Author tested for therapist and cohort main effects. None significant.
Allocation concealment	B – Unclear

#### Study **Hall 1985**

Methods	Country: USA Recruitment: referred by physicians, friends or self Randomization: randomly assigned within time constraints, no details of method Groups of 5-6
Participants	Referred by physicians, friends or self Av. cpd 30.5 Therapists: 2 psychologists

### Characteristics of included studies (Continued)

Interventions	1. Intensive behavioural treatment (including RP skill training, relaxation, 30 sec aversive smoking of 3 cigarettes). 14 x 75 min sessions over 8w. 2. Same as 1. + 2 mg nicotine gum available for 6m. 3. Low-contact + nicotine gum. Met 4x in 3w, educational materials, written exercises, group discussion
Outcomes	Abstinence at 52w Validated by CO < 10ppm, TCN < 85 mg/mL, reports of significant others (biochemical measures failed to confirm self report in 3 instances)
Notes	No non-group control. 2 vs 3, RP, not matched for contact time, controlled for gum. 1 not included in meta-analysis, 10/36 quit.
Allocation concealment	B – Unclear

#### Study Hall 1987

Methods	Country: USA Randomization: no details given Treatment: 5-6 member groups
Participants	139 smokers Therapists: Advanced graduates in clinical psychology or health psychology
Interventions	2x2 factorial trial. Nicotine gum/placebo arms collapsed 1. Intensive behavioural treatment including 6 sec aversive smoking, RP skills training, written exercises. 14 x 75 min sessions (period not stated) 2. 'Low contact' including written exercises, educational materials, group discussions, quitting techniques. 5 x 60 min meetings.
Outcomes	Abstinence at 52w Validation by TCN < 95mm/L (unless marijuana use reported), CO < 8ppm, 'significant other'.
Notes	No non-group control. There was no reported interaction between behaviour therapy condition and gum condition so gum/no gum collapsed. 1 vs 2, RP not controlling for length
Allocation concealment	B – Unclear

#### Study Hall 1994

Methods	Country: USA Recruitment: Community volunteers or referrals Randomization: no details given
Participants	149 smokers (> 10 cpd) 48% male, Av age 41, Av cpd 25, 31% had history of MDD Therapists: physician, psychologist. Both received training
Interventions	2 mg nicotine gum was prescribed for both groups 1. Standard group therapy. 5 sessions over 8w. Information and group support for planning and implementing individual strategies. 2. Mood Management. 10 sessions over 8w. Similar to 1, plus specific cognitive-behavioural components for developing skills for coping with situations leading to poor mood. Thought stopping, rational-emotive techniques, relaxation etc
Outcomes	Continuous abstinence at 52w. (Confirmed quit at all prior assessments and no smoking in previous week.) Validation: CO <= 10ppm and urine cotinine <= 60ng/ml
Notes	No non-group control 2 vs 1, eval of additional mood management component

## Characteristics of included studies (Continued)

Allocation concealment B – Unclear

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<b>Study</b>	<b>Hall 1996</b>
Methods	Country: USA Recruitment: community volunteers Randomization: After stratification by depression history and no. of cigarettes smoked. Group size
Participants	201 smokers (> 10 cpd) 48% male, Av age 40, Av cpd 24; 22% had history of MDD Therapists: not described
Interventions	2 x 2 factorial design. Nicotine gum/ placebo arms collapsed All groups had 10 sessions over 8w. Quit date at 3rd session. 1. Standard group therapy including written exercises, handouts, homework. Group discussion. 2. Cognitive behavioural Mood Management. Same programme as Hall 1994 arm 2.
Outcomes	Continuous abstinence at 52w. (Confirmed quit at all prior assessments and no smoking in previous week.) Validation: urine cotinine <= 60 ng/ml
Notes	No non-group control nicotine/placebo arms collapsed. 2 vs 1, evaluation of mood management component, controlling for contact time.
Allocation concealment	B – Unclear

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<b>Study</b>	<b>Hall 1998</b>
Methods	Country: USA Recruitment: community volunteers. Exclusion criteria included MDD within 3m of baseline Randomization: by computer, after stratification on history of MDD and number of cigarettes smoked
Participants	199 smokers of >= 10 cpd 55% female, av age 40, av cpd 21-25; 33% had history of MDD
Interventions	2 x 2 factorial design. Alternative pharmacological interventions were Nortriptyline titrated to therapeutic levels - usually 75-100 mg/day for 12w or placebo. Collapsed in this analysis 1. Health Education 2. Cognitive behavioural mood management (See Hall 1994 for description of each intervention)
Outcomes	Abstinence at 64w (1 yr post-treatment) Continuous abstinence rates not reported by psychological treatment group. Validation: CO < 10ppm and cotinine <3 41 nmol/L
Notes	No non-group control Nortriptyline/placebo arms collapsed, no drug X psychological treatment interaction. Same behavioral interventions compared as Hall 1994
Allocation concealment	A – Adequate

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<b>Study</b>	<b>Hall 2002</b>
Methods	Country: USA Recruitment: community volunteers. Exclusion criteria included current MDD Randomization: method not specified, 'double blind'
Participants	220 smokers of >= 10 cpd 40-47% female, av age 37-43, av cpd 20-23; 33% had history of MDD Therapists: masters level counsellors

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### Characteristics of included studies (Continued)

Interventions	3 x 2 factorial design with pharmacotherapies: bupropion, nortriptyline, or placebo 1. Medical Management (MM) control: physician advice, S-H, 10-20 min 1st visit, 5 min at 2,6,11w) 2. Psychological Intervention (PI) as MM plus 5x 90 min group sessions at 4,5,5, 7,11w)
Outcomes	Prolonged abstinence at 1 yr (47w post-quit date). PP also reported Validation: CO <= 10 ppm, urine cotinine <= 60 ng/mL
Notes	1 vs 2, group versus physician advice, No significant interaction between pharmacotherapy and behaviour therapy, so pharmacotherapy arms collapsed in analysis.
Allocation concealment	B – Unclear

#### Study Hill 1993

Methods	Country: USA Recruitment: radio and newspaper adverts Randomization: block assignment to treatment Therapists: Each group had two instructors from a pool of six all with experience in smoking cessation and/or exercise training.
Participants	82 community volunteers aged 50+ who had smoked for over 30 yrs
Interventions	1. Behavioural Training (BT) adapted from Lung Health Study programme. Included quit date setting, RP training with role play of coping responses. 12 x 90 min session over 3m 2. BT + nicotine gum 3. BT + additional physical exercise 4. Exercise and S-H pamphlet. This was a placebo control matched for contact time to 3. Therapist, who was blind to study hypothesis, encouraged smokers to quit at the exercise meetings.
Outcomes	5 day abstinence at 12m. (Abstinence at previous follow ups not required) Validation: CO < 10 ppm or informant confirmation
Notes	1 vs 4 for group vs minimal intervention control. Exercise component considered in separate review (Ussher 2005)
Allocation concealment	B – Unclear

#### Study Hilleman 1993

Methods	Country: USA Recruitment: print advertisements Randomization: no details
Participants	150 community volunteers for a drug trial Therapists; not described
Interventions	1. Behaviour modification training, 12 x 1hr classes over 3m + transdermal clonidine 2. Same behaviour modification as 1, + placebo patches 3. S-H printed material (I Quit Kit), transdermal clonidine 4. S-H printed material, placebo patches
Outcomes	Cessation at 1 yr Partial validation by random plasma TCN monitoring
Notes	Drug arms collapsed as no evidence for a treatment group interaction reported. 1 + 2 vs 3 + 4 in comparison of group vs S-H control, although the I Quit Kit is only a brief pamphlet.
Allocation concealment	B – Unclear

#### Study Hollis 1993

Methods	Country; USA
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### Characteristics of included studies (Continued)

Recruitment: Patients visiting outpatient internal medicine and family practice offices in a group practice health maintenance organisation.

Randomization: On basis of digits in health record number, but providers delivering initial message said to be blind to assignment.

Participants	2707 smokers who received provider (physician, physician assistant or nurse practitioner) advice to quit Therapists: Project nurse or health counsellor
Interventions	If subjects refused to see a counsellor they were mailed information appropriate to their assignment. 1. Advice - In addition to provider advice, given brief pamphlet by health counsellor 2. Self-quit - Cessation advice, CO assessment, 10 min video, stop smoking kit, and choice of S-H manuals. Encouraged to set quit date. 1 follow-up telephone call and series of mailings. 3. Group referral. Cessation advice, CO assessment. Video encouraged use of intensive (9 meetings over 2 months) group programme, and waiver of fee. Effort made to schedule attendance. 4. Combination. Participants shown video explaining both self-help and group approaches, and encouraged to choose one.
Outcomes	1 yr 2-point prevalence abstinence (7 days at 3 and 12m) Validation: Saliva cotinine at 1 yr. Most conservative outcome is used in which self-reported non-smokers who did not provide saliva samples are recorded as smokers.
Notes	3 vs 2 in group vs self-help programme. 3 vs 1 in group vs minimal intervention control.
Allocation concealment	B – Unclear

#### Study **Jorenby 1995**

Methods	Country: USA (2 sites) Recruitment: media Randomization: method not stated
Participants	504 community volunteers smoking $\geq 15$ cpd Therapists: Trained smoking cessation counsellors
Interventions	Compared 22 mg vs 44 mg nicotine patch and 3 types of adjuvant treatment. Patch groups collapsed. All participants had 8 weekly assessments by research staff 1. Minimal: Given S-H pamphlet by physician during screening visit for trial entry, and instructed not to smoke whilst wearing patch. No further contact with counsellors. 2. Individual: Given S-H pamphlet at screening visit along with motivational message. Also met nurse counsellor x3 following quit date. Nurse helped generate problem-solving strategies and provided praise and encouragement. 3. Group: Given S-H pamphlet at screening visit along with motivational message. Received 8x 1hr weekly group sessions. Skills training, problem-solving skills.
Outcomes	7 day PP abstinence at 26w Validation: CO < 10ppm.
Notes	No sig diff in dose-related outcome and no dose-counselling interaction at 26w reported, so patch arm collapsed in analysis. 3 vs 1 in group + NRT vs NRT with minimal support. 3 vs 2 in group vs individual (different programme).
Allocation concealment	B – Unclear

#### Study **Killen 1984**

Methods	Country: USA Recruitment: media advertising Randomization: Method not stated. individual randomization
Participants	64 community volunteers (44 in relevant arms) Av. age 44, av cpd 32 Therapists: 3: 2 psychologists, 1 medical social worker, assigned randomly to treatment conditions

## Characteristics of included studies (Continued)

	Group size 10-12
Interventions	All participated in cessation training (including cognitive behavioral skills training and an aversive smoke-holding procedure), 4 x 1.5hr sessions over 4 days, in groups of 10-12. 1. Nicotine Gum for 7w 2. Skills training in RP, 2 sessions in 2w then 4 weekly drop-in sessions. Included identification of high risk situations and coping strategies 3. Combined 1 and 2
Outcomes	Abstinence for 4w at 10.5m after quit date Validation: CO < 8ppm (2 people unable to attend assessment, based on self report), Serum TCN measured at 6w only
Notes	No non-group control 11 people not included: 7 didn't attend 1st session, 2 dropped out for medical reasons, 2 didn't provide physician consent. 3 vs 1 for effect of additional RP component over NRT alone. 2 not included in analysis
Allocation concealment	B – Unclear

### Study Lando 1985

Methods	Country: USA Recruitment: media advertizing Randomization: method not stated Group size: 8-12
Participants	130 smokers (65 in relevant arms) 51% female, Av. age 38, av cpd 30
Interventions	All received orientation + 2 weekly + 6 consecutive sessions in week 3, then quit day 1. Included Nicotine fading + 7 maintenance (RP) sessions over 6w 2. Included nicotine fading. No post-quit maintenance 3. Incl oversmoking + RP 4. Included nicotine fading + oversmoking + RP
Outcomes	Abstinence at 12m (PP) Validation: CO and informants
Notes	No non-group control Oversmoking and smoke-holding conditions not used. 2 vs 1 for effect of maintenance/ RP sessions
Allocation concealment	B – Unclear

### Study Lando 1990

Methods	Country: USA, 3 sites Recruitment: media advertizing Randomization: by group Group size av 10-11
Participants	1041 smokers 57% female, Av age 43, av cpd 29 Therapists: trained facilitators
Interventions	1. ACS FreshStart. Orientation + 4 x 1 hr sessions over 2w. No TQD set 2. ALA Freedom from Smoking. Orientation + 7 x 90-120 min sessions over 7w. TQD at 3rd session. 3. Laboratory-derived programme. 16 x 45-60 min sessions over 9w. Nicotine fading procedure and smoke-holding used during preparation phase.
Outcomes	Sustained abstinence (slips allowed) at 1 yr. (PP and quit attempts also reported)

### Characteristics of included studies (Continued)

	Validation: attempted for 43% sample. serum TCN < 80-100 ng/ml. Borderline cases required cotinine < 15 ng/ml
Notes	No non-group control Results not displayed in graphs. 1. 12% (N = 331) 2. 19% (N = 363) 3. 22% (N = 347) P = 0.014 corrected for design effect No facilitator effect found.
Allocation concealment	B – Unclear

<b>Study</b>	<b>Lando 1991</b>
Methods	Country: USA Recruitment: media advertizing Randomization: intake groups randomized to treatment
Participants	353 community volunteers Therapists: Trained facilitators, mainly graduates, including some who had quit through clinic programme.
Interventions	Both interventions included 16 x 45-60 min sessions over a 9w period. Nicotine fading schedule prior to quit date at 3w. 1. Enriched cohesiveness intervention: included written commitments and exercises designed to facilitate positive group interaction 2. Standard group treatment
Outcomes	1 yr sustained (relapse-free) abstinence Validation: randomly selected subsample of those claiming abstinence, but not clear whether reported data includes a correction for false reporting.
Notes	No non-group control Originally a factorial design comparing satiation and nicotine fading in addition to cohesiveness manipulation, but satiation arm abandoned. Only data for nicotine fading procedure arms reported in paper. P values reported in the paper were corrected for the design effects of clustering.
Allocation concealment	B – Unclear

<b>Study</b>	<b>Leung 1991</b>
Methods	Country: Hong Kong Recruitment: media advertisements Randomization: no details
Participants	95 community volunteers (63 in relevant arms) Av. age 35-39, av cpd 25-30
Interventions	1. Behavioural programme including self monitoring, management techniques, coping skills. 10 x 1.5 hr sessions over 2w. 2. Auricular acupuncture. Same no. of sessions. 3. Waiting list control
Outcomes	Abstinence (not defined) at 6m Validation by cohabitant and work colleague report.
Notes	1 vs 3, group vs waiting list control.
Allocation concealment	B – Unclear

<b>Study</b>	<b>McDowell 1985</b>
Methods	Country: Canada

**Characteristics of included studies (Continued)**

	Recruitment: Volunteers visiting family practices for scheduled appointments Randomization: method not stated Groups of 10-15
Participants	366 smokers in 9 group family practices Therapists: depended on intervention
Interventions	1. Physician advice by one of 12 family physicians. 15 min counselling session with U.S. 'NCI Helping Smokers Quit Kit' and one postal follow up. 2. Operation Kick-It programme'. 9 sessions. Therapists: public health nurse or health educator 3. Cognitive Behavior Modification programme. 9 sessions. Therapists: one of two M.Ed psychologists 4. Self-monitoring control followed up at 2, 6 and 12m.
Outcomes	Abstinence (over 1w diary period) at 12m Validation: participants warned that saliva TCN might be tested, but only a few sampled. No results reported.
Notes	No evidence of a difference between 2 and 3 so combined and compared with 1 in group vs physician or nurse advice/counselling, and with 4 in minimal intervention control. 3 vs 2 in skills rehearsal vs skills discussion
Allocation concealment	B – Unclear

**Study McGovern 1991**

Methods	Country: USA Recruitment: community volunteers Randomization: 4 clinics randomly allocated to each Group size 12-16
Participants	110 smokers 50% female, Av. age 41, av. cpd 33 Therapists: 3 trained paraprofessionals, each conducting same no. of each type
Interventions	All groups received 16 x 45-60 min sessions over 9w. Treatments differed in fading technique used during 3w pre-quit period. 1. Brand switching. Weekly switch to lower rated nicotine brand, 30-50-80% schedule. 2. Nicotine fading. Graduated filters reducing nicotine on same schedule.
Outcomes	Continuous relapse-free abstinence at 1 yr. Validation: none
Notes	No non-group control 1 yr quit rates were not sig diff. 11/57 (19%) for brand switching and 12/53 (23%) graduated filters
Allocation concealment	B – Unclear

**Study Minthorn-Biggs 2000**

Methods	Country: Canada Recruitment: Community volunteers Randomization: method not stated. Group size, not stated
Participants	75 smokers 68% female, av. age 41, av.cpd 25 Therapists: Study author or Lung Association facilitator
Interventions	1. Canadian Lung Association Countdown programme. 7 weekly sessions 2. Social interaction programme. 12 sessions over 6w + 4 weekly. Skills training 3. No-treatment control
Outcomes	Abstinence at 6m (12m rates only available for groups 1 and 2) Validation: none

### Characteristics of included studies (Continued)

Notes	1+2 vs 3 in comparison of group vs no treatment 3 vs 2 in evaluation of additional skills training. No control for therapist effects
Allocation concealment	B – Unclear
<b>Study</b>	<b>Nevid 1997</b>
Methods	Country: USA Recruitment: community volunteers, via media and healthcare settings Randomization: random number table, but unclear whether concealed. stratified by sex Group size: 3-12, single-sex groups, same-sex therapists
Participants	93 Hispanic smokers (excludes 56 people, 35 Gr, 21 S-H who were randomized but did not attend any session and were not included in further analysis) 48% female, av. age 44, av. cpd 21 Therapists: bilingual Hispanic psychologists and social workers
Interventions	1. Group therapy. 8 x 2 hrs. Included videos using culturally specific components. Motivation, nicotine fading, quitting techniques, RP, 'buddy' support. TQD 5th week 2. S-H with 1 group session for motivation and instructions and telephone contact. ALA 'Freedom from Smoking in 20 days' in English & Spanish, also 'Guia para Dejar de Fumar' Both conditions received same maintenance programme; ALA S-H manual 'A Lifetime of Freedom from Smoking' and 2 telephone calls a month for 6m.
Outcomes	Abstinence at 12m (sustained from post-treatment). PP rates also reported Validation. Saliva cotinine
Notes	1 vs 2 in comparison of group vs S-H. Low take-up rates. 33% of eligible attended orientation session, only 62% of enrollees attended any further session. Using 12m PP rates would give 3/39 vs 4/54 quit.
Allocation concealment	B – Unclear
<b>Study</b>	<b>Omenn 1988</b>
Methods	Country: USA Recruitment: Single worksite (13,000 workers, 9 employers) Randomization: by nurses at aid stations using randomized assignment lists generated by research centre, within preference for format.
Participants	159 smokers 66% male, av. age 43, av cpd 25, with preference for group programme or no preference. (Smokers with preference for S-H were not allocated to group programmes.) Led by instructors trained in both programmes.
Interventions	1. Multiple Component programme. 3 sessions over 3w 2. RP programme. 6 sessions over 6w 3. Minimal Treatment programme. S-H materials only. ACS 22-page 'Quitter's Guide' 7-day plan.
Outcomes	Abstinence at 12m (single PP) Validation: saliva cotinine <= 35ng/ml
Notes	1+2 vs 3 in comparison of group vs different S-H. No difference in outcome at 12m between 2 group programmes. Self-reported quit rates similar across all 3 conditions but more missing saliva samples in S-H so validated rates lower.
Allocation concealment	A – Adequate

**Characteristics of included studies (Continued)**

<b>Study</b>	<b>Patten 2002</b>
Methods	Country: USA Recruitment: Volunteers attending alcoholics anonymous Randomization: method not stated Group size approx 8
Participants	48 smokers with history of alcohol dependence but 3m of drug and alcohol abstinence av. age 42, av cpd 28 Therapists: different clinical psychologist and doctoral student pair for each condition
Interventions	1. Behavioural counselling, 12 x 2hr weekly, TQD wk 8. Includes nicotine fading, skills training, homework, discussion 2. As 1 + Cognitive Behavioural Mood Management skills training. Same length
Outcomes	Abstinence at 12m, sustained at 1, 3m. Validation: CO < 10ppm (PP rates and informant or CO-validated rates also reported)
Notes	Originally included as Patten 1998 with results for MDD+ve subgroup only. No non-group control 2 vs 1 for effect of additional mood management component
Allocation concealment	B – Unclear
<b>Study</b>	<b>Pederson 1981</b>
Methods	Country: USA Recruitment: volunteers for a S-H smoking cessation programme Randomization: method not stated. Participants switched between the 2 manuals because of scheduling constraints.
Participants	40 smokers
Interventions	1. Pomerleau & Pomerleau manual, an introductory session, followed by 1 hr group meetings at 2 and 6w. 2. Danaher & Lichtenstein manual and same schedule of meetings as 1. 3. Waiting list control
Outcomes	Abstinence at 6m for at least 3m Validation: none
Notes	This was described by the authors as a S-H programme but the 3 meetings met criteria for a group programme.
Allocation concealment	B – Unclear
<b>Study</b>	<b>Powell 1981</b>
Methods	Country: USA Recruitment: media adverts, word of mouth, participants in a health study who had expressed interest in quitting. Randomization following cessation programme. Deviations for scheduling conflict and in order to separate families and friends. Therapist: Senior author
Participants	51 participants, 34 used in analysis
Interventions	All participants received same cessation programme in a single group. Introductory meeting and 4 consecutive treatment meetings a week later, 1.5hrs. Systematic focus on skill development. Also used a novel aversive smoking exercise conducted at each session. Maintenance/RP conditions: 1. A 4w support group (no. of meetings not specified) 2. Telephone contact system allowing subjects to phone each other 3. No contact control

**Characteristics of included studies (Continued)**

Outcomes	Self-reported abstinence at 1 yr follow up No validation
Notes	No non-group control 1 vs 3 for evaluation of additional RP element. (2 not included in analysis)
Allocation concealment	B – Unclear

<b>Study</b>	<b>Rabkin 1984</b>
Methods	Country: Canada Recruitment: Media advertisements Randomization: no details
Participants	168 community volunteers (67 in relevant arms) Av. age 40yrs, av cpd 24
Interventions	1. Behaviour modification. Multicomponent, 5 x 45-90 min meetings over 3w. Therapist trained in group behavioural techniques, groups of approx 10. 2. Health Education. Single group meeting with didactic lectures by a health professional, film, discussion. Individual session with a therapist 1w later including a counselling element. 3. Hypnosis 4. Waiting list control, with no long term follow up
Outcomes	Self-reported abstinence via questionnaire at 6m follow up No validation at 6m.
Notes	1 vs 2 in comparison of group vs other method. 2 does not meet criteria of >1 group session, and includes a session of individual counselling. Drop-outs re-included.
Allocation concealment	B – Unclear

<b>Study</b>	<b>Rice 1994</b>
Methods	Country: USA Recruitment: Health professional and self referral Randomization: No details. Stratified by sex, smoking history and history of cardiovascular incident.
Participants	406 smokers with a cardiovascular health problem Therapists: Clinical nurse specialist who had undergone a 1w teaching workshop for Smokeless (a multi-component intervention in 6 booklets including elements of skills training, behavioural rehearsal, aversive puffing).
Interventions	All except control received Smokeless 1. Individual Intervention: Met with nurse for 4 x 1hr sessions in 1st week and single maintenance session in 2nd week. 2. Group Intervention: Met in groups of 5-7 on same schedule 3. Written intervention: Given Smokeless materials in labelled envelopes to open on same schedule. Prompted by call from project secretary. 4. No Intervention: Advice from nurse to quit smoking
Outcomes	PP at 1 yr Saliva TCN tested but not used to correct self report
Notes	The published data was based on 255 subjects willing to participate in the treatment allocated. Numbers randomized to treatment provided by author. 2 vs 3, group vs self help; 2 vs 1, group vs individual therapy, 2 vs 4, group vs minimal intervention.
Allocation concealment	B – Unclear

**Characteristics of included studies (Continued)**

<b>Study</b>	<b>Sawicki 1993</b>
Methods	Country: Germany Recruitment: From a university diabetic outpatients clinic Randomization: no details
Participants	Diabetic smokers prepared to participate in a stop-smoking programme
Interventions	1. Extensive behaviour therapy including self control. 10 x 90 min weekly sessions. Led by a psychotherapist 2. Physician advice, 15 min unstructured session. Nicotine replacement offered in the case of severe addiction.
Outcomes	Abstinence at 6m. Validation by serum cotinine <20 ng/ml
Notes	Only 25/44 participated in group programme and 31/45 received physician advice.
Allocation concealment	B – Unclear

<b>Study</b>	<b>Smith 2001</b>
Methods	Country: USA Recruitment: community volunteers Randomization: method not stated. Randomized 1w after TQD, stratified by +/- smoking post-TQD
Participants	677 smokers (> 10 cpd) making a quit attempt using NRT 57% female, av.age 42, av cpd approx 25
Interventions	All participants had attended 3 brief (5-10 min) individual counselling sessions pre-quit, quit day & 8 days post-TQD, + nicotine patches (8w) + NCI 'Clearing The Air'. 1. No further intervention 2. Cognitive behavioural skills training, 6 sessions from 1w post-TQD, including managing negative affect, homework, manual. 3. Motivational interviewing (MI), supportive group counselling, x 6 from 1w post-TQD. No homework or manual.
Outcomes	Abstinence at 12m (7 day PP) Validation: CO < 10ppm
Notes	2+3 vs 1 in separate comparison of effect of group vs brief counseling alone. (Comparison 1.3.3) 2 vs 3 in separate comparison of CBT vs MI in Comparison 4.2.3. No evidence found for hypothesized differences in relative efficacy for smokers at high or low risk of relapse. High risk smokers expected to do better with MI.
Allocation concealment	B – Unclear

<b>Study</b>	<b>Stevens 1989</b>
Methods	Country: USA Recruitment: Kaiser Permanente Health Maintenance Organization (HMO) members Randomization: By a predetermined random number list following confirmed 4 day abstinence after cessation programme
Participants	587 HMO member volunteers who successfully abstained from smoking for 4 days after a 4 day intensive cessation programme.
Interventions	Test of RP programmes after successful cessation. Both groups met for 3 x 2hr weekly meetings 1. Skills condition. Development and active rehearsal of coping strategies 2. Discussion condition. Social support meetings without rehearsal of strategies 3. No further treatment control
Outcomes	Self report at 1 yr of no tobacco use in previous 6m. Validation: Saliva TCN < 0.8mg/ml or cotinine < 5ng/ml

### Characteristics of included studies (Continued)

Notes No non-group control  
1 vs 3 for effect of additional RP. 1 vs 2 for effect of skills rehearsal vs social support

Allocation concealment A – Adequate

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#### Study **Ward 2001**

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Methods Country: Jamaica  
Recruitment: Community volunteers  
Randomization: method not stated

Participants 75 smokers (+35 assigned to a waiting list control, not included in review)  
57% female, Av age approx 39  
Treated in 4 groups  
Therapist: not described

Interventions 1. Group therapy with emphasis on self efficacy and stages of change, and use of NRT. 3 x 2 hr weekly + follow up at 7w. Chose own quit date.  
2. as 1 plus cognitive counter-conditioning. Group developed negative images of smoking to be used when smoking.

Outcomes Abstinence at 12m (PP).  
Validation: saliva cotinine. Cut off not specified.

Notes No non-group control  
2 vs 1 for effective of additional component

Allocation concealment B – Unclear

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#### Study **Zelman 1992**

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Methods Country: USA  
Recruitment: Community volunteers  
Randomization: method not stated  
Group size: 3-6

Participants 116 smokers (excludes 10 early drop-outs evenly divided across groups)  
54% female, av age approx 50  
Therapists: clinical psychologists, 2 per group

Interventions Behavioural counselling with nicotine gum or rapid smoking conditions collapsed here  
1. Coping Skills Training. 6 x 60+ min over 2w. TQD night before first session. Develop strategies, reframing, contracting, thought stopping  
2. Informational and supportive counselling. Discussion, sharing of ideas and feelings. Same schedule of sessions and TQD as 1.

Outcomes Sustained abstinence at 12m (no lapses > 3 days)  
Validation: Collateral report at 12m (CO used up to 3m follow up, blood cotinine at 6m)

Notes No non-group control  
Authors state that inclusion of drop-outs does not affect results.  
1 vs 2 in comparison of relapse prevention components

Allocation concealment B – Unclear

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ALA: American Lung Association

ACS: American Cancer Society

av: average (mean)

CBT: cognitive behavioural therapy

CO: Carbon Monoxide

cpd: cigarettes per day

FTQ: Fagerstrom Tolerance Questionnaire

hr: hour(s)

m: month(s)  
 MDD: Major Depressive Disorder  
 min: minute.  
 NCI: National Cancer Institute  
 NRT: nicotine replacement therapy  
 NS: statistically non-significant  
 PP: Point prevalence abstinence  
 ppm: parts per million  
 RP: Relapse Prevention  
 Rx: treatment  
 S-H: self-help.  
 sig diff: statistically significant difference  
 TCN: thiocyanate  
 TQD: Target Quit Day  
 vs: versus  
 w: week(s)  
 yr: year(s)

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### Characteristics of excluded studies

Study	Reason for exclusion
Bernstein 1970	No long-term follow-up.
Bertera 1990	Not randomized.
Campbell 1995	Not randomized.
Carlson 2003	Not controlled
Cinciripini 1994	The minimal contact self-help control condition included 8 weekly visits to the research centre to fill out questionnaires and review progress. Although participants did not receive a formal intervention they were encouraged to discuss their progress and were directed to the appropriate section of the self-help materials (I Quit Kit). Allocation to treatment alternated for successive sequences of 5 subjects.
Cinciripini 1995	All interventions received same basic group programme. 4 arms differed in pre-cessation programme of scheduled smoking.
Colletti 1979	Primary outcome was reduction in smoking rate. Quit rates not given by treatment group. 42 participants randomized to 3 maintenance strategies following same cessation programme.
Colletti 1980	Primary outcome was reduction in smoking rate. Quit rates not given at maximum follow up, reported not to be significantly different. 29 participants randomized to 2 maintenance procedures, one involving 4w additional therapy contact.
Decker 1989	Not randomized - run sequentially. Compared an identical programme delivered at group meetings or by weekly mailings.
Elliott 1978	Primarily a study of aversive smoking.
Frikart 2003	Not controlled
Glasgow 1978	No abstinence data reported at 3 or 6m follow up
Green 2003	Not controlled
Hamilton 1979	No follow up of control group at 6m. Treatment arms investigated addition of social support
Hamilton 1998	Only 3m follow up. Randomization not reported in abstract
Hilleman 2004	Not randomized; historical control
Katz 1977	Only 3m follow-up. Abstinence rates not reported by group. Compared 3 different group programmes.
Kisely 2003	Not randomized

### Characteristics of excluded studies (Continued)

Klesges 1999	Not group therapy: intervention was a single 50 min group session using a computer-interactive format.
Lando 1982	A small trial manipulating multiple factors.
Larson 1999	Only 35 participants split among 3 programme variants. Randomization and length of follow up not reported in abstract.
Lowe 1980	Evaluates the effect of adding covert sensitization training to a group programme. Covered by review of aversion therapy (Hajek 2001).
Martin 1997	Compared group programmes with and without an exercise component. No non-group control. Included in Cochrane review of exercise for smoking cessation (Ussher 2005)
McIntyre 1986	Compared an additional spouse support element with a basic programme. No non-group control.
Mogielnicki 1986	Assignment to a group programme or a mailed self-help programme was sequential. There appeared to be limited follow up of participants receiving mailed programmes.
Nyborg 1986	Couples were allocated to treatment and success rates were reported by couple.
Perkins 2001	Primarily a study of CBT for weight control
Pirie 1992	Compared additional weight control element with a standard programme, also effect of nicotine gum in a factorial design. No non-group control.
Razavi 1999	Primarily a study of relapse prevention, see Cochrane review of interventions for relapse prevention (Hajek et al)
Schauffler 2001	Participants were randomized to be eligible for OTC NRT and a group behavioural cessation programme as part of their HMO benefit. NRT and group therapy were therefore confounded. Cessation rates were significantly higher in intervention group; 18% vs 13% at 12m. However only 1.2% participated in a behavioural programme.
Schwartz 1968	Success was defined as a reduction in smoking of > 85%, not complete abstinence, and no period of continuous reduction was required at follow up. The study compared combinations of group vs individual vs no counselling and tranquilizer (equanil) vs placebo vs no prescription. It is included in the review of anxiolytics and antidepressants (Hughes 1997).
Supnick 1984	Compared 4 maintenance strategies after initial therapy. No. of abstainers not reported by group at 6m follow up. The differences in content and outcome for the 4 strategies were small.
Thompson 1988	A complete factorial design included combinations of physician advice, self-help materials and referral to American Health Foundation Smoking cessation classes. Not primarily a trial of group therapy. Take-up of group programme was very low.
Tiffany 1986	Primarily a trial of different forms of rapid smoking, included in aversion review (Hajek 2001). No non-group control.
Vellisco 2001	Not randomized. Patients were allocated to an information only or a psychological counselling group in order of attendance.

CBT: cognitive behavioural therapy

HMO: Health Maintenance Organization

m: month(s)

min: minute(s)

NRT: nicotine replacement therapy

OTC: over the counter

## ANALYSES

### Comparison 01. Group format behavioural programmes vs Other format

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Smoking cessation. Group programme vs self-help programme	16	4395	Odds Ratio (Fixed) 95% CI	2.04 [1.60, 2.60]
02 Smoking cessation. Group programme vs individual therapy	5	1409	Odds Ratio (Fixed) 95% CI	0.86 [0.66, 1.12]
03 Smoking cessation. Group programme vs Other treatment			Odds Ratio (Fixed) 95% CI	Totals not selected
04 Smoking cessation. Group plus NRT vs NRT alone	2	454	Odds Ratio (Fixed) 95% CI	1.05 [0.69, 1.60]
05 Smoking cessation. Group versus 'no intervention' controls	7	815	Odds Ratio (Fixed) 95% CI	2.17 [1.37, 3.45]

### Comparison 02. Comparisons between different group programmes [Outcome Long term cessation for all comparisons]

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Relapse Prevention/ Skills training components	15	1738	Odds Ratio (Fixed) 95% CI	1.32 [1.08, 1.61]
02 Mood management	6	1230	Odds Ratio (Fixed) 95% CI	1.06 [0.81, 1.40]
03 Mood management (sub group MDD history +)	5	363	Odds Ratio (Fixed) 95% CI	1.35 [0.78, 2.33]
04 Manipulation of group dynamics	4	562	Odds Ratio (Fixed) 95% CI	1.22 [0.84, 1.77]
05 Other miscellaneous comparisons			Odds Ratio (Fixed) 95% CI	Totals not selected

### Comparison 99. Tabulation of programme characteristics

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Programme characteristics			Other data	No numeric data

## INDEX TERMS

### Medical Subject Headings (MeSH)

Behavior Therapy [\*methods]; Program Evaluation; \*Psychotherapy, Group; Randomized Controlled Trials; Smoking [\*prevention & control]; Smoking Cessation [\*methods]

### MeSH check words

Humans

## COVER SHEET

**Title** Group behaviour therapy programmes for smoking cessation

**Group behaviour therapy programmes for smoking cessation (Review)**  
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<b>Authors</b>	Stead LF, Lancaster T
<b>Contribution of author(s)</b>	LS & TL jointly conceived the review, shared data extraction and drafting.
<b>Issue protocol first published</b>	1998/1
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<b>Date of most recent SUBSTANTIVE amendment</b>	16 February 2005
<b>What's New</b>	The review update published in issue 2, 2005 includes four new studies. There are no changes to the main conclusions.
<b>Date new studies sought but none found</b>	Information not supplied by author
<b>Date new studies found but not yet included/excluded</b>	Information not supplied by author
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<b>Contact address</b>	Mrs Lindsay Stead Review Group Co-ordinator Department of Primary Health Care Oxford University Old Road Campus Headington Oxford OX3 7LF UK E-mail: lindsay.stead@dphpc.ox.ac.uk Tel: +44 1865 226977 Fax: +44 1865 227036
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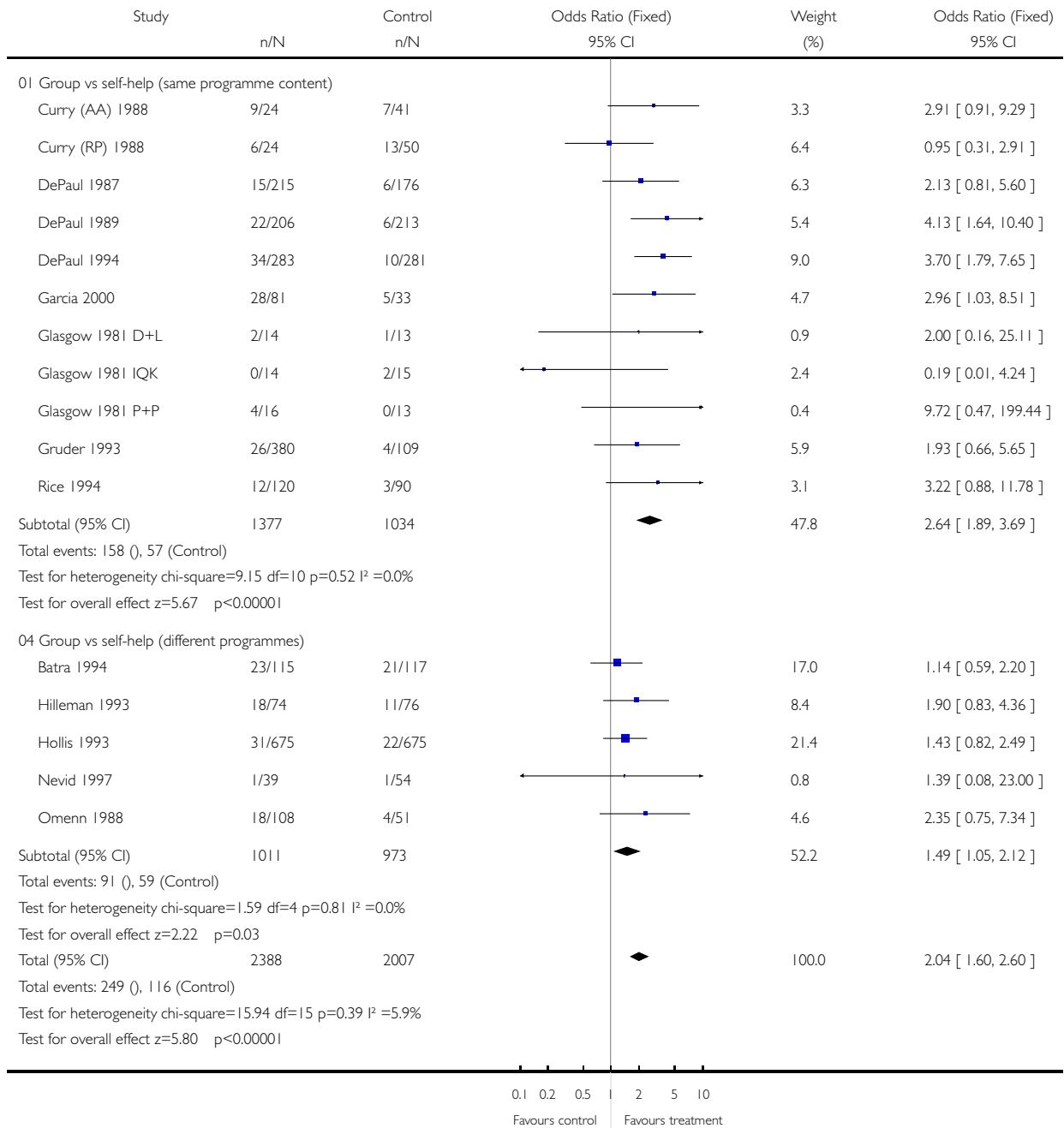
## GRAPHS AND OTHER TABLES

### Analysis 01.01. Comparison 01 Group format behavioural programmes vs Other format, Outcome 01 Smoking cessation. Group programme vs self-help programme

Review: Group behaviour therapy programmes for smoking cessation

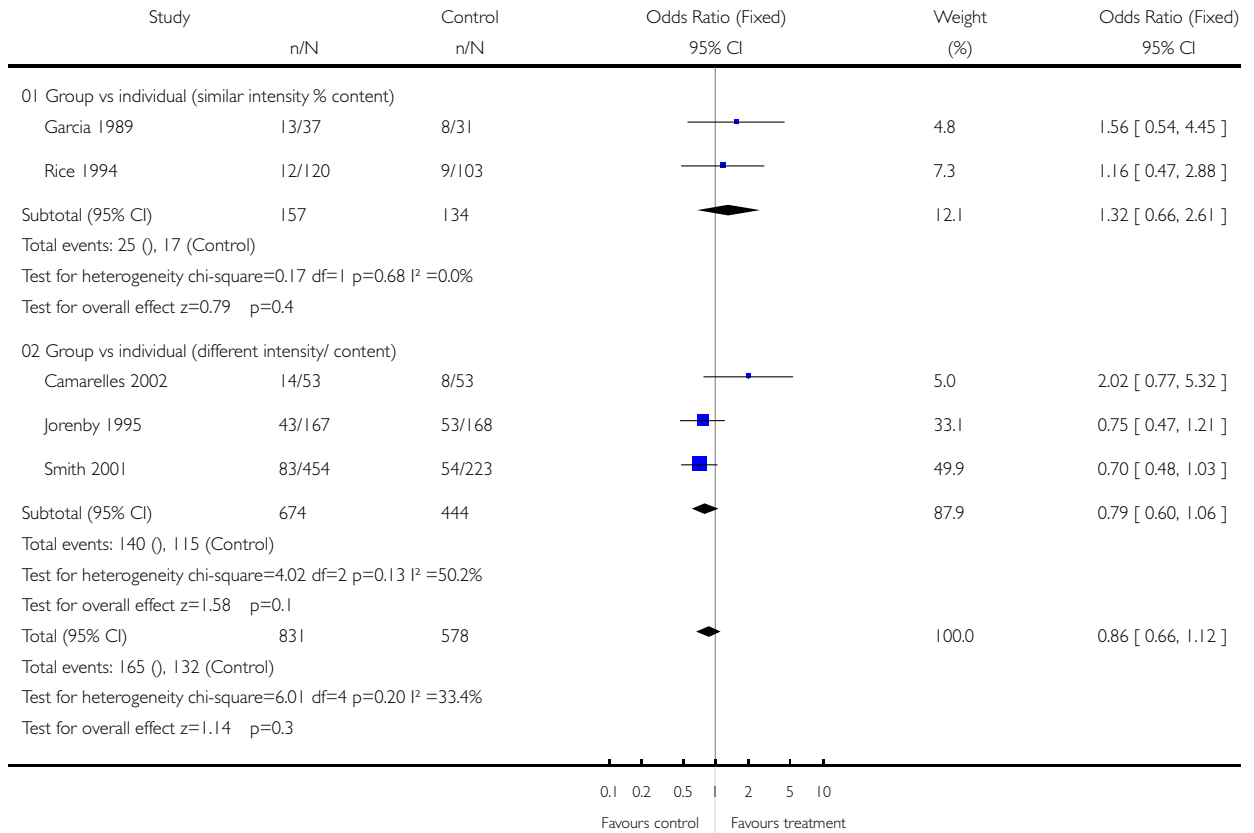
Comparison: 01 Group format behavioural programmes vs Other format

Outcome: 01 Smoking cessation. Group programme vs self-help programme



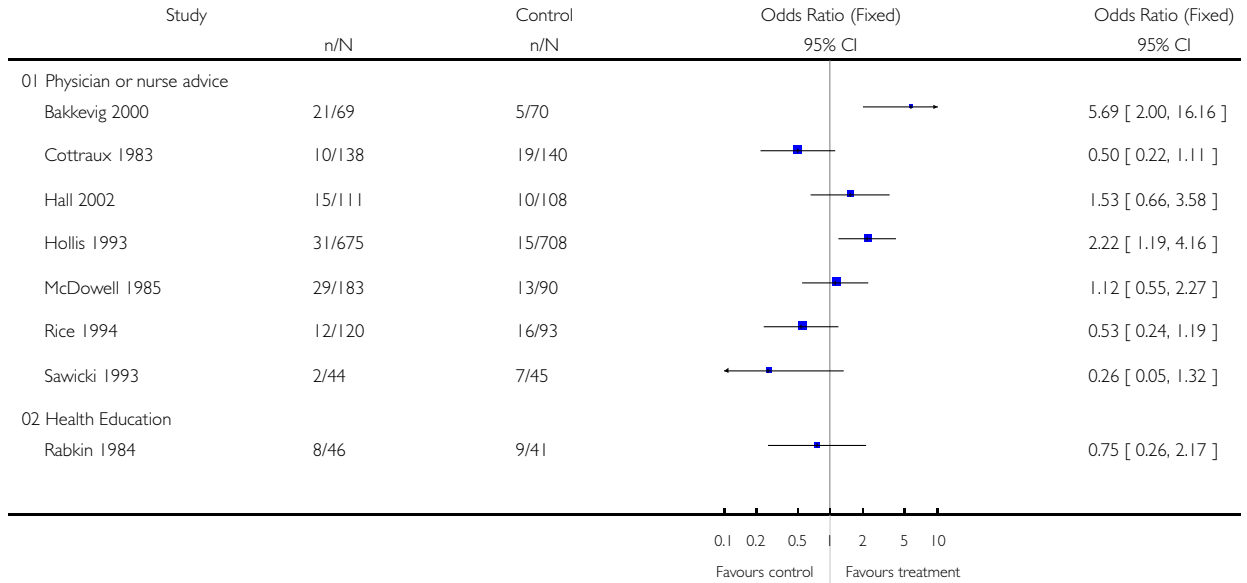
**Analysis 01.02. Comparison 01 Group format behavioural programmes vs Other format, Outcome 02 Smoking cessation. Group programme vs individual therapy**

Review: Group behaviour therapy programmes for smoking cessation  
 Comparison: 01 Group format behavioural programmes vs Other format  
 Outcome: 02 Smoking cessation. Group programme vs individual therapy



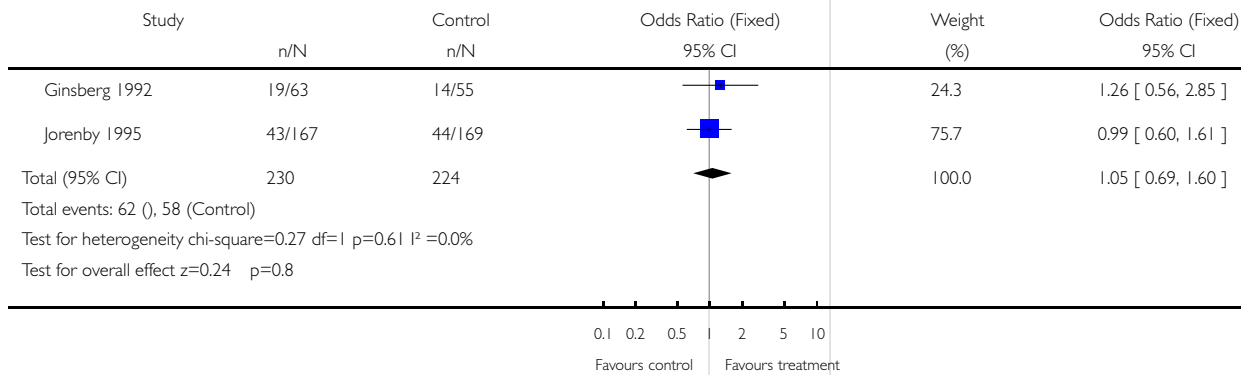
**Analysis 01.03. Comparison 01 Group format behavioural programmes vs Other format, Outcome 03 Smoking cessation. Group programme vs Other treatment**

Review: Group behaviour therapy programmes for smoking cessation  
 Comparison: 01 Group format behavioural programmes vs Other format  
 Outcome: 03 Smoking cessation. Group programme vs Other treatment



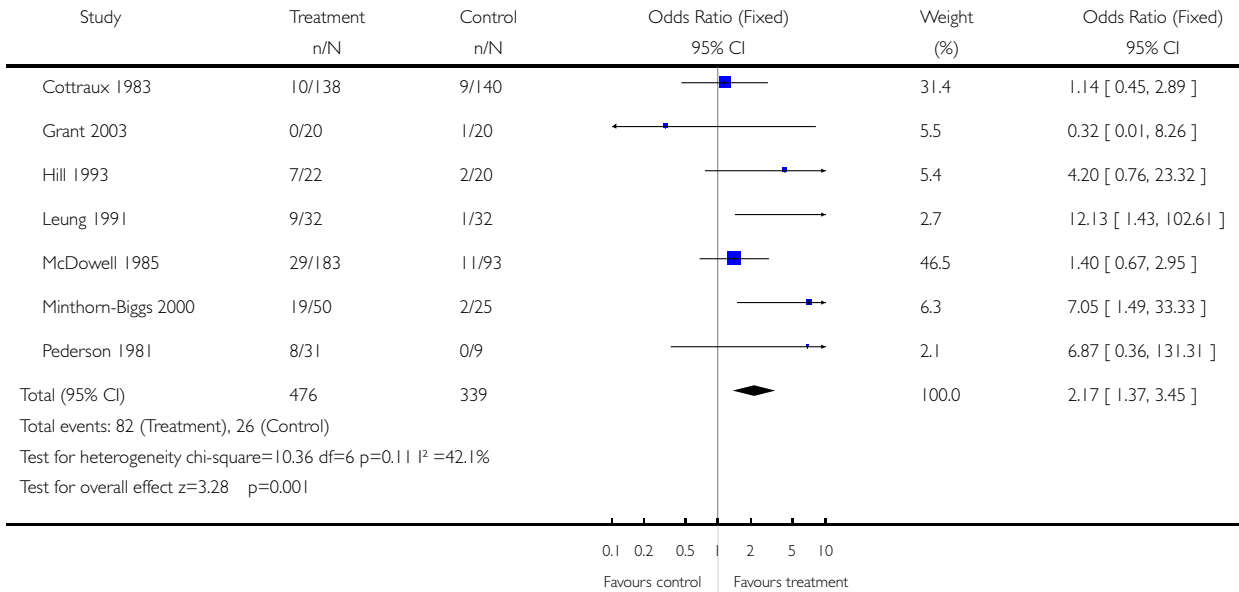
**Analysis 01.04. Comparison 01 Group format behavioural programmes vs Other format, Outcome 04 Smoking cessation. Group plus NRT vs NRT alone**

Review: Group behaviour therapy programmes for smoking cessation  
 Comparison: 01 Group format behavioural programmes vs Other format  
 Outcome: 04 Smoking cessation. Group plus NRT vs NRT alone



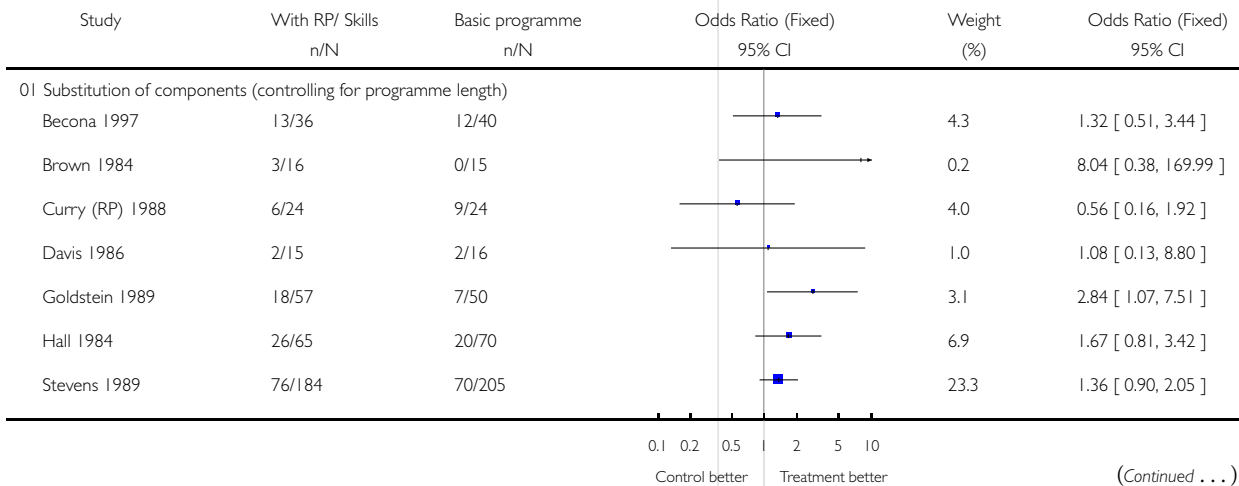
**Analysis 01.05. Comparison 01 Group format behavioural programmes vs Other format, Outcome 05 Smoking cessation. Group versus 'no intervention' controls**

Review: Group behaviour therapy programmes for smoking cessation  
 Comparison: 01 Group format behavioural programmes vs Other format  
 Outcome: 05 Smoking cessation. Group versus 'no intervention' controls

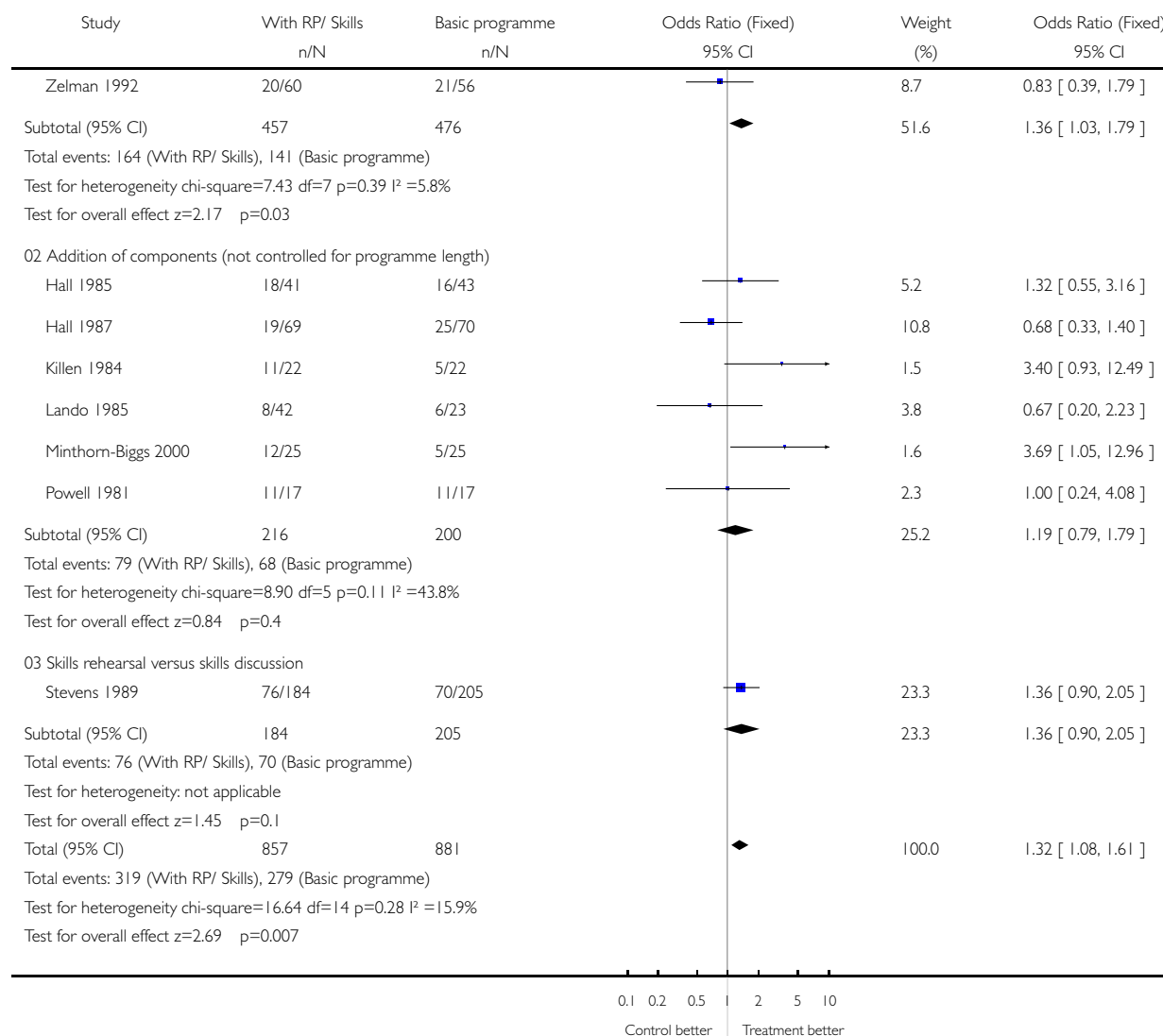


**Analysis 02.01. Comparison 02 Comparisons between different group programmes [Outcome Long term cessation for all comparisons], Outcome 01 Relapse Prevention/ Skills training components**

Review: Group behaviour therapy programmes for smoking cessation  
 Comparison: 02 Comparisons between different group programmes [Outcome Long term cessation for all comparisons]  
 Outcome: 01 Relapse Prevention/ Skills training components



(... Continued)

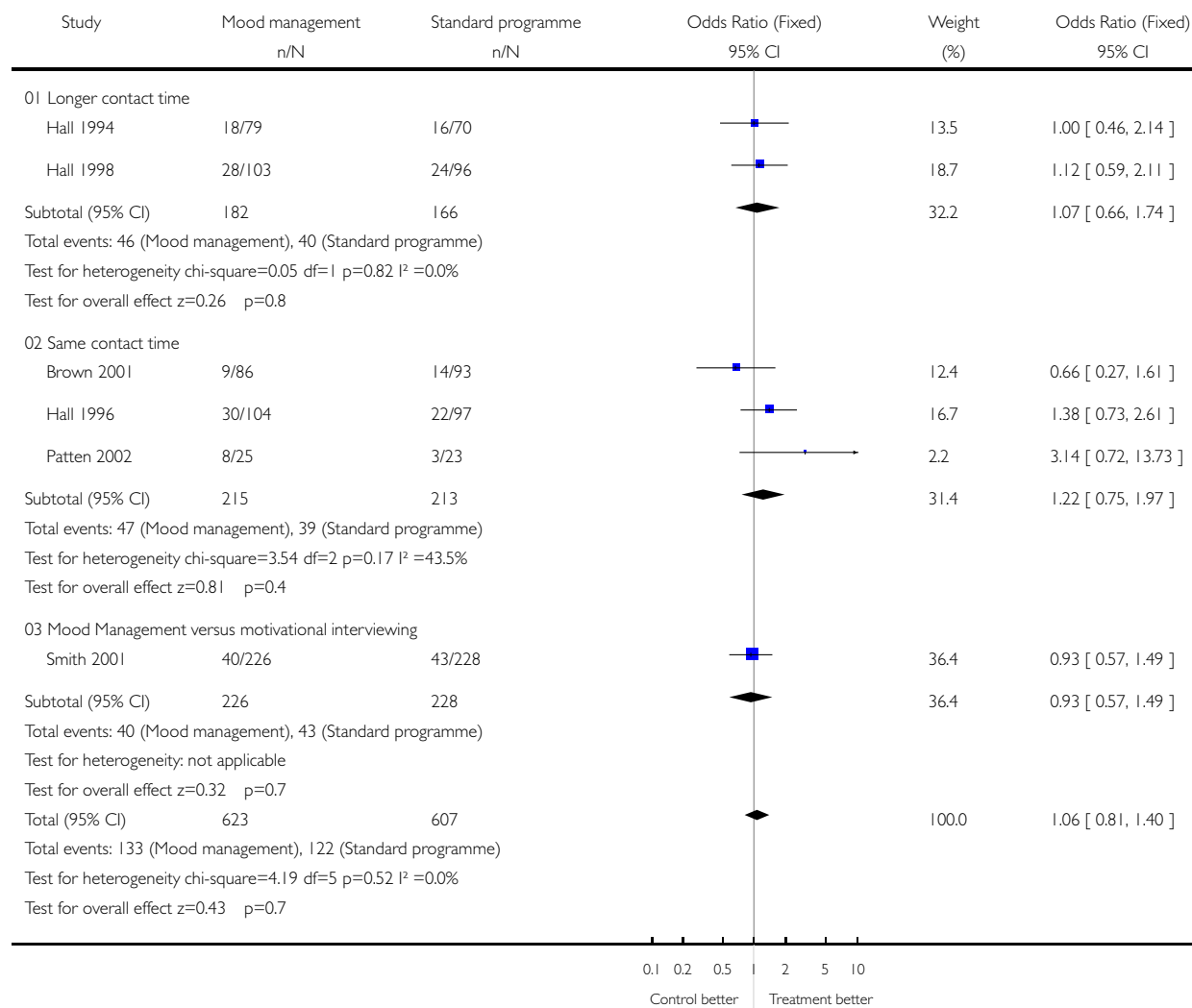


## Analysis 02.02. Comparison 02 Comparisons between different group programmes [Outcome Long term cessation for all comparisons], Outcome 02 Mood management

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 02 Comparisons between different group programmes [Outcome Long term cessation for all comparisons]

Outcome: 02 Mood management

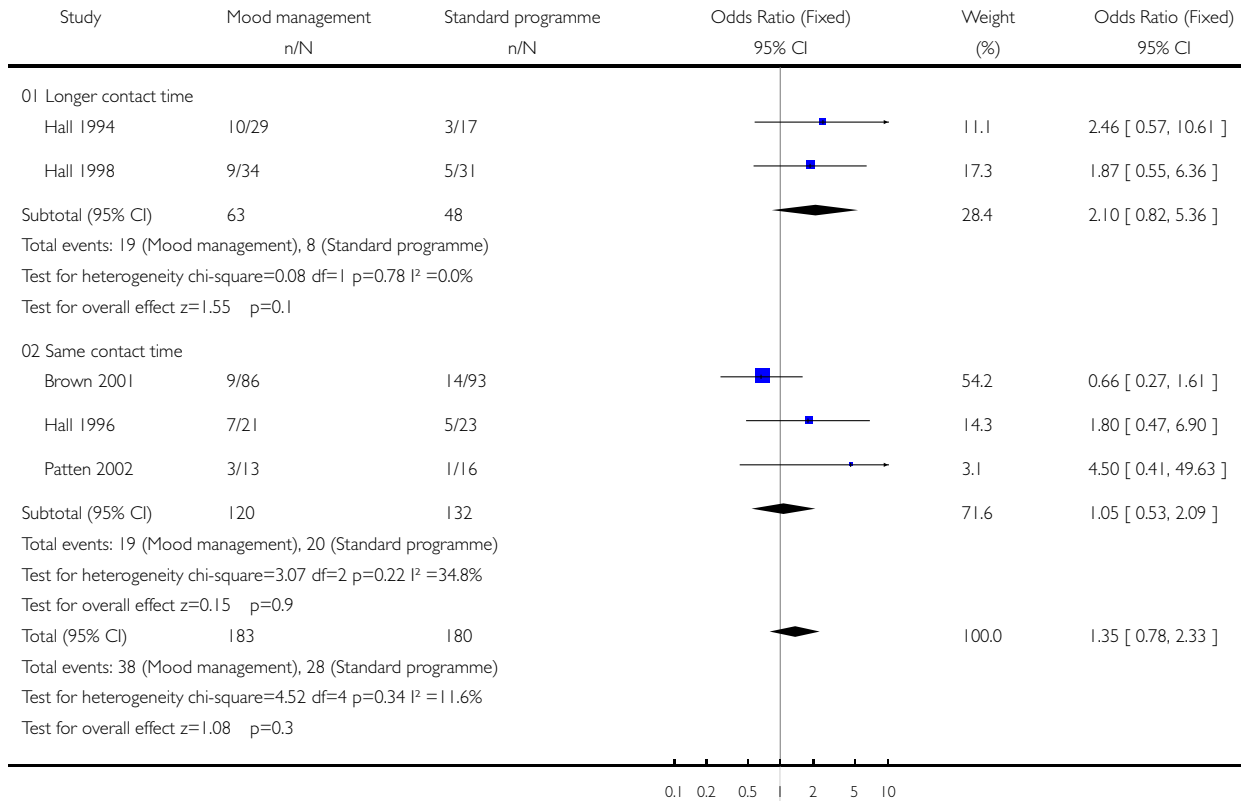


**Analysis 02.03. Comparison 02 Comparisons between different group programmes [Outcome Long term cessation for all comparisons], Outcome 03 Mood management (sub group MDD history +)**

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 02 Comparisons between different group programmes [Outcome Long term cessation for all comparisons]

Outcome: 03 Mood management (sub group MDD history +)

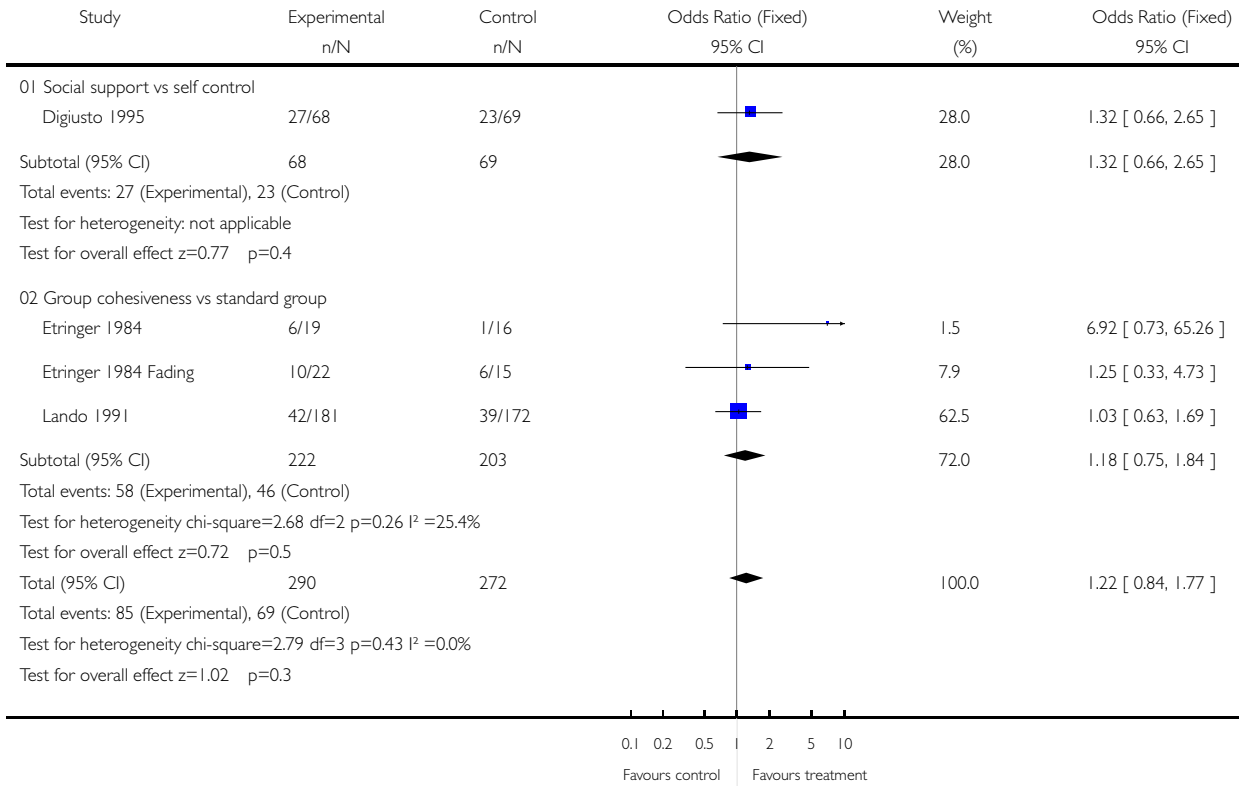


**Analysis 02.04. Comparison 02 Comparisons between different group programmes [Outcome Long term cessation for all comparisons], Outcome 04 Manipulation of group dynamics**

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 02 Comparisons between different group programmes [Outcome Long term cessation for all comparisons]

Outcome: 04 Manipulation of group dynamics

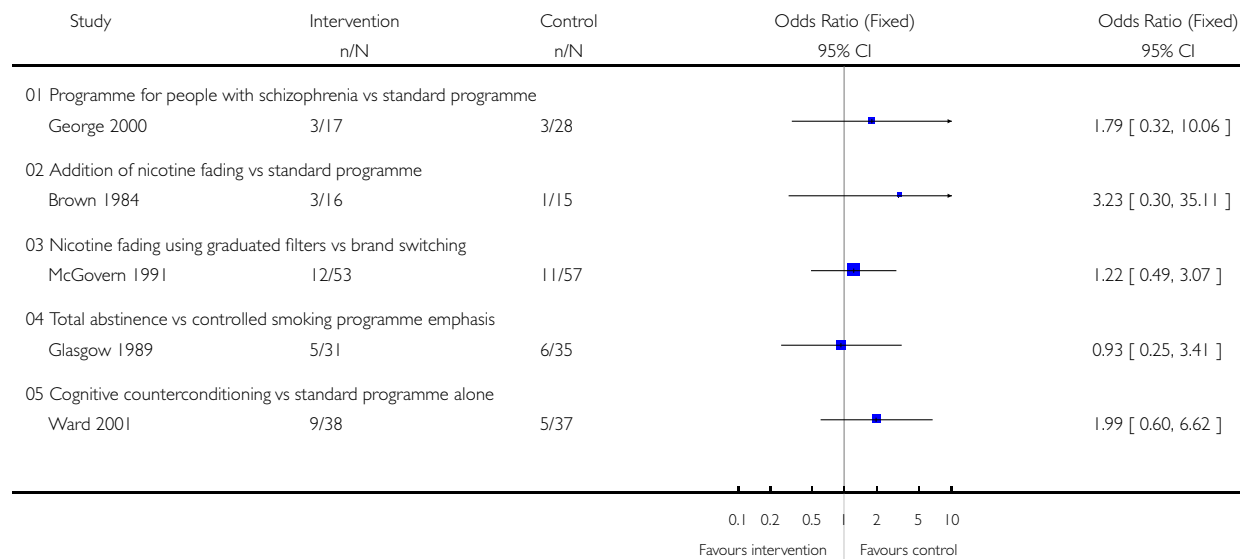


**Analysis 02.05. Comparison 02 Comparisons between different group programmes [Outcome Long term cessation for all comparisons], Outcome 05 Other miscellaneous comparisons**

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 02 Comparisons between different group programmes [Outcome Long term cessation for all comparisons]

Outcome: 05 Other miscellaneous comparisons



**Analysis 99.01. Comparison 99 Tabulation of programme characteristics, Outcome 01 Programme characteristics**

**Programme characteristics**

Study	PROGRAMME	LENGTH	TOTAL PERIOD	MAIN FOCUS	SPECIAL FEATURES
Cottraux 1983	Not a named programme 15/ group with two therapists	3 Sessions of 3 hrs each 9 hours in total	2 weeks	Behaviour therapy	Given relaxation and stress-desensitization audiotape for daily use
Curry (AA) 1988	Traditional programme emphasising absolute abstinence (AA)	8 Sessions of 2 hrs each 16 hours in total	8 weeks	Addictive nature of smoking and the necessity for complete abstinence. Included focused smoking, health education and contingency contracting	
Curry (RP) 1988	Experimental relapse prevention programme 12/ group with two	8 sessions of 2 hrs each 16 hours in total	8 weeks	Smoking as a maladaptive learned behaviour. Focus on skills acquisition	

**Programme characteristics** (*Continued*)

<b>Study</b>	<b>PROGRAMME</b>	<b>LENGTH</b>	<b>TOTAL PERIOD</b>	<b>MAIN FOCUS</b>	<b>SPECIAL FEATURES</b>
	therapists				
DePaul 1987	American Lung Association 'Freedom from Smoking in 20 days' 5-9/group, led by a company employee who had had a 3 hour training session in leading groups	6 x 45 min sessions twice/week	Three weeks	Supportive setting for smokers who were using the self-help manual to share experiences, obtain advice from other smokers and ask questions.	Group programmes concurrent with 20 daily television programmes following the same approach.
DePaul 1989	American Lung Association 'Freedom from Smoking in 20 days'	6 x 45 min session twice/week, then 1 hour monthly sessions for next 12 months	12 months	Initial meetings focused on reviewing techniques discussed in the television programme and self-help manuals. Follow-up meetings emphasised how participants could utilize the supportive aspects of their social environment to aid quitting or remaining abstinent.	Participants used ALA manual and watched concurrent tv programme. Also eligible for incentives in the form of monthly lotteries from the end of the intervention for 12 months
DePaul 1994	Based on American Lung Association 'Freedom from Smoking in 20 days' Groups leaders came from university psychology departments or had led Chicago Lung Association groups	6 Sessions in first 3 weeks followed by 14 booster meetings over following 6 months at a gradually reducing frequency	6 months	Cognitive behavioural orientation. Participants were given handouts based on ALA manual, and instructed in self monitoring, relaxation, establishing a buddy system, generating coping strategies. Booster sessions included goal-setting, role-playing and	Televised 1 week cessation series 'Smoke-free in the 90s, and a newspaper supplement. Continued quitters were eligible to earn \$1/day for each day abstinent between the 14 booster sessions, up to \$175 over 6 months.

**Programme characteristics** (*Continued*)

<b>Study</b>	<b>PROGRAMME</b>	<b>LENGTH</b>	<b>TOTAL PERIOD</b>	<b>MAIN FOCUS</b>	<b>SPECIAL FEATURES</b>
Digiusto 1995	Two programmes designed to be comparably effective and appropriate for ongoing provision.	Social support: 5 meetings and 3 mail follow-ups Self-control: 4 meetings	Not clear. Final meeting one week after quit date	problem solving. Comparing emphasis on social support elements of the group, with didactic presentation and limited interaction.	Focus of study was on differential effectiveness among subgroups of smokers. No predictions made as to relative efficacy of either programme
Etringer 1984	Cessation using either nicotine-fading or satiation procedure plus maintenance +/- and procedure for enriching group cohesiveness	9 x 45-60mins	9 weeks, but differing schedule depending on cessation procedure. Quit day in third week	Self-reward and punishment contracts, problem-solving.	Attempted to manipulate the group interaction process. (See also Lando 1991)
Garcia 2000	Based on manual 'Programa para Dejar de Fumar', Becona	5 or 10 x 1hr sessions	5 weeks	Multicomponent programme, including nicotine fading	Manipulated amount of therapist contact and additional benefit of a self-help manual
Glasgow 1981 D+L	Danaher & Lichtenstein programme 4-6/group. Therapists: a clinical psychologist or behaviour therapy students.	8 sessions, length not specified	Approx 8 weeks.	Progressive relaxation, alternative quit strategies including aversive smoking option, managing thoughts.	A published manual suitable for self-help use. In the group format the therapists previewed the material for the next meeting and led subjects in demonstrations of treatment procedures
Glasgow 1981 P+P	Pomerleau & Pomerleau 4-6/group	8 sessions, length not specified	Approx 8 weeks	Gradual reduction by eliminating smoking in gradually more difficult situations. Stimulus control techniques and a modification of covert sensitization used.	A published manual suitable to self-help use. In the group treatment format the therapist reviewed and rehearsed the contents.
Gruder 1993	American Lung	3 x 90 min sessions	3 weeks	Discussion - review	Concurrent with a

**Programme characteristics** (Continued)

<b>Study</b>	<b>PROGRAMME</b>	<b>LENGTH</b>	<b>TOTAL PERIOD</b>	<b>MAIN FOCUS</b>	<b>SPECIAL FEATURES</b>
	Association 'Freedom from Smoking in 20 days' Two group variants - Discussion, and Social support Leaders were primarily nurses and health educators			of self-help manual Social Support - instructions on how to get help from buddies and others, specific scenarios discussed.	televised cessation programme. participants also scheduled to receive telephone calls at 1 and 2 months after end of programme. Social support participants also received a Quitter's Guide whilst buddies received a Buddy Guide.
Hall 2002	'Psychological intervention'	5 x 90 min sessions	11 weeks (quit day in week 5)	Discussion, self-monitoring of smoking and affective states, motivation	Focus on Mood management. Factorial design with bupropion/nortriptyline/placebo therapy
Hill 1993	Adapted from programme used by the Lung Health Study comparing effect of additional exercise programme	12 x 90min sessions 18 hours in total	3 months	Tailored health information, setting a quit date, RP training including identifying and role playing high risk situations.	Targeted at older smokers
Hilleman 1993	Behaviour modification training	12 x 1hr sessions 12 hours in total	12 weeks	Described only as a standardised behaviour modification training. States that participants had to attend a minimum of two classes before making a cessation attempt	Factorial design with clonidine/placebo drug therapy
Hollis 1993	Freedom from Cigarettes (Kaiser Permanente HMO)	9 meetings, length not specified	8 weeks	Multicomponent programme	Participants randomised to this programme, and who visited the counsellor, were shown a video encouraging them to use it.
Jorenby 1995	Programme not	8 x 1hr sessions	8 weeks	Identification of	Also received

**Programme characteristics** (*Continued*)

<b>Study</b>	<b>PROGRAMME</b>	<b>LENGTH</b>	<b>TOTAL PERIOD</b>	<b>MAIN FOCUS</b>	<b>SPECIAL FEATURES</b>
	specified Trained smoking cessation counsellors	8 hours in total		high risk situations, coping skill training, emotional support	nicotine gum
Lando 1991	Same basic laboratory programme as Lando 1990	16 x 45-60min sessions Approx 14 hours in total	9 weeks	Self monitoring and developing active coping strategies, nicotine fading. Unstructured group discussion with emphasis on shared problem solving	Trial manipulated group cohesion via addition of written exercises to facilitate positive group interaction. Used a positive modelling video.
Leung 1991	'behavioral therapy'	10 x 90min sessions 15 hours in total	Two weeks	Self monitoring, stimulus control, coping skill training, assertion training and relaxation.	
McDowell 1985	Cognitive Behaviour modification (CBM) or Operation Kick-It (British Columbia Lung Association)	CBM: 9 x 90min session OKI: 9 x 90min session	CBM: 10 weeks OKI: 8 weeks	CBM: Behavioral rehearsal, cognitive restructuring, relaxation procedures OKI: Foster mutual support, discuss information and review problems	CBM was conducted by M.Ed psychologists, whilst OKI was lead by a public health nurse or a special education teacher.
Omenn 1988	Two different programmes: Multiple Component (MCP) or Relapse Prevention (RPP) were compared to the self-help control.	MCP - 3 Sessions of 2 hrs RPP - 8 Sessions of 2 hrs	MCP - 3 weeks RPP - 8 weeks	MCP - Combined behavioural skills training, aversive stimuli, imagery and stress management. Highly structured didactic programme. Focus on initial cessation RPP - Emphasised the prevention of coping skills to prevent relapse. Choice of immediate or phased cessation. Interactive format.	

**Programme characteristics** (*Continued*)

<b>Study</b>	<b>PROGRAMME</b>	<b>LENGTH</b>	<b>TOTAL PERIOD</b>	<b>MAIN FOCUS</b>	<b>SPECIAL FEATURES</b>
Rabkin 1984	Behaviour modification	5 x 45-90mins	3 weeks	Self monitoring, stimulus control and strategies for change.	
Rice 1994	Smokeless (American Institute for Preventive Medicine) 5-7/group	5 Sessions of 1hr each 5 hours in total, 4 in 1st week	2 weeks	Offers a variety of skills that individuals can elect to develop including aversive puffing, stimulus control, relaxation training, contingency contracting, thought stoppage, eating and stress management, exercise and behavioral rehearsal.	
Sawicki 1993	Extensive structured behaviour therapy	10 x 90min session	10 weeks	Gradual decrease in smoking with quit date after 5th session.	