# Educational outreach visits: effects on professional practice and health care outcomes (Review)

**O'Brien MA, Rogers S, Jamtvedt G, Oxman AD, Odgaard-Jensen J, Kristoffersen DT, Forsetlund L, Bainbridge D, Freemantle N, Davis DA, Haynes RB, Harvey EL**


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## ABSTRACT

**Background**
Educational outreach visits (EOVs) have been identified as an intervention that may improve the practice of healthcare professionals. This type of face-to-face visit has been referred to as university-based educational detailing, academic detailing, and educational visiting.

**Objectives**
To assess the effects of EOVs on health professional practice or patient outcomes.

**Search strategy**
For this update, we searched the Cochrane EPOC register to March 2007. In the original review, we searched multiple bibliographic databases including MEDLINE and CINAHL.

**Selection criteria**
Randomised trials of EOVs that reported an objective measure of professional performance or healthcare outcomes. An EOV was defined as a personal visit by a trained person to healthcare professionals in their own settings.

**Data collection and analysis**
Two reviewers independently extracted data and assessed study quality. We used bubble plots and box plots to visually inspect the data. We conducted both quantitative and qualitative analyses. We used meta-regression to examine potential sources of heterogeneity determined a priori. We hypothesised eight factors to explain variation across effect estimates. In our primary visual and statistical analyses, we included only studies with dichotomous outcomes, with baseline data and with low or moderate risk of bias, in which the intervention included an EOV and was compared to no intervention.

**Main results**
We included 69 studies involving more than 15,000 health professionals. Twenty-eight studies (34 comparisons) contributed to the calculation of the median and interquartile range for the main comparison. The median adjusted risk difference (RD) in compliance with desired practice was 5.6% (interquartile range 3.0% to 9.0%). The adjusted RDs were highly consistent for prescribing (median 4.8%, interquartile range 3.0% to 6.5% for 17 comparisons), but varied for other types of professional performance (median 6.0%, interquartile range 3.6% to 16.0% for 17 comparisons). Meta-regression was limited by the large number of potential explanatory factors (eight) with only 31 comparisons, and did not provide any compelling explanations for the observed variation in adjusted RDs. There were 18 comparisons with continuous outcomes, with a median adjusted relative improvement of 21% (interquartile range 11% to 41%). There were eight trials (12 comparisons) in which the intervention included an EOV and was compared to another type of intervention, usually audit and feedback. Interventions that included EOVs appeared to be slightly superior to audit and feedback.

Only six studies evaluated different types of visits in head-to-head comparisons. When individual visits were compared to group visits (three trials), the results were mixed.

**Authors' conclusions**
EOVs alone or when combined with other interventions have effects on prescribing that are relatively consistent and small, but potentially important. Their effects on other types of professional performance vary from small to modest improvements, and it is not possible from this review to explain that variation.

## PLAIN LANGUAGE SUMMARY

Educational outreach visits are personal visits to health care professionals in their own settings. They are also called 'academic detailing'. The review found that educational outreach visits appeared to improve the care delivered to patients. For prescribing the effects were relatively consistent and small, but potentially important. For other types of professional performance the effects varied widely and this variation could not be explained from this review.

## BACKGROUND

Educational outreach visits (EOVs) have been identified as an intervention that has the potential to change health professional practice, particularly prescribing by physicians (Soumerai 1989; Soumerai 1990). The term educational outreach is used to describe a personal visit by a trained person to health professionals in their own settings. This type of 'face-to-face' visit has been referred to as university-based educational detailing, public interest detailing, and academic detailing. Originally described as a multi-component process by Soumerai 1989, key principles included surveys of practitioners to determine barriers to appropriate practice and the subsequent development of an intervention that was tailored to address those barriers using simple messages; targeting of practitioners with low compliance; and the delivery of the intervention by a respected person. The intervention often included feedback on existing practice. Since the original description, several investigators have altered some of these components, so that there is now a variety of different types of EOVs that also appear to vary in effectiveness (e.g. Avorn 1992; Freemantle 2002; Fretheim 2006; Soumerai 1993; Witt 2004).

In a recent review of the effectiveness of guidelines implementation strategies, Grimshaw 2004 reported that educational outreach visits appear to have modest effects when compared to no intervention. They found 13 comparisons in which EOVs were part of a multi-faceted intervention. They reported a median effect size of 6% (interquartile range (-4% to 17.4%) for studies with dichotomous outcomes. For studies with continuous outcomes, the median relative improvement was 15% (interquartile range 1.7% to 24%). When EOVs were compared to other interventions, the effect sizes were smaller than those when EOVs were compared to no intervention. EOVs appeared slightly more effective than educational materials or audit and feedback (Grimshaw 2004). Arnold 2005 investigated the effectiveness of different strategies in improving prescribing of antibiotics by healthcare professionals in the outpatient setting. They reported that EOVs had mixed results. EOVs seemed to be effective in two of three studies in which the goal was to reduce the use of certain overused or contraindicated antibiotics. Similarly, there were mixed results in two studies in which the goal was to increase the use of first-line antibiotics (Arnold 2005).

In this update, we investigated whether different factors influence the effectiveness of EOVs. Similarly, we investigated whether adding another intervention to EOVs alters their effectiveness. Some reviews have suggested that multi-faceted interventions are more effective than simple interventions, while other, more recent reviews have reported that multi-faceted interventions do not appear to be any more effective (Grimshaw 2004; Jamtvedt 2006) than simpler interventions.

The methods for this update differ from those used in the previous version of this review. They reflect developments in review methods, particularly those used in EPOC reviews (Doumit 2007; Grimshaw 2003; Jamtvedt 2006). As previously published studies have concluded that printed educational materials seem to have little or no effect (Freemantle 1997), we did not consider printed educational materials as an intervention. However, the more recent review by Grimshaw 2004 did find an effect, so future updates should evaluate this issue again.

## OBJECTIVES

This review, which updates O'Brien 1997, addresses the following question: are educational outreach visits (EOVs) effective in improving health professional practice and healthcare outcomes?

To answer this question, we considered the comparisons listed below.

1. Any intervention in which EOVs are a component compared to no intervention, with or without printed educational materials. The primary aim of this analysis was to explore heterogeneity, including potential differences between the effects of EOVs alone and EOVs as a component of multi-faceted interventions. The main explanatory factors that we considered were:

- the targeted behaviour (prescribing versus other behaviours)
- baseline compliance
- the number of clinicians included at each visit
- the number of EOVs
- the complexity of the targeted behaviour
- the seriousness of the outcome
- risk of bias (high versus moderate)
- the contribution of EOVs as a component of the intervention

The first four factors (targeted behaviour, baseline compliance, the number of clinicians included at each visit and the number of visits) were considered primary factors. The last four factors (complexity of the behaviour, the seriousness of the outcome, the risk of bias, and the contribution of EOVs as a component of the intervention) were considered as secondary factors.

2. EOVs alone compared to no intervention.

3. Any intervention in which EOVs were a component compared to another intervention including audit and feedback and reminders.

4. Any comparison of different types of EOVs.
We included any direct comparisons in which participants were randomised to two or more types of EOVs.

## CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

### Types of studies

Randomised controlled trials (RCT).

### Types of participants

Healthcare professionals responsible for patient care. We excluded studies that included only students.

### Types of intervention

Educational outreach visits, defined as use of a trained person from outside the practice setting who meets with healthcare professionals in their practice settings to provide information with the intent of changing their performance. The information given may include feedback about their performance. The intervention may be tailored based upon previously identified barriers to change. The person delivering the EOV may be from the same organisation, if it is a multi-site organisation, but not from the same practice site.

### Types of outcome measures

Objectively measured professional performance in a healthcare setting or healthcare outcomes. We excluded studies that measured knowledge or performance in a test situation only.

## SEARCH METHODS FOR IDENTIFICATION OF STUDIES

See: methods used in reviews.

See: Effective Practice and Organisation of Care Group search strategy. The original search comprised several electronic bibliographic databases, including MEDLINE and CINAHL. We updated the review primarily by using the EPOC register and pending file. We identified all articles in the Cochrane Effective Practice and Organisation of Care (EPOC) register in March 2007 that were coded as an RCT and the EPOC controlled vocabulary term 'educational outreach visit'. The Trials Search Co-ordinator also searched the EPOC pending file (studies selected from the EPOC search strategy results and awaiting assessment) in March 2007

We did test searches in MEDLINE and EMBASE to check if additional papers were found that were not included in the EPOC register. The reference lists of related systematic reviews and all relevant articles obtained were screened.

## METHODS OF THE REVIEW

For this update, two reviewers (MAOB and GJ, SR, DB or LF) independently selected the trials included in the review. We resolved disagreements by discussion.

We assessed the risk of bias for all eligible trials using the criteria described by the EPOC group (see 'Editorial information' under 'Group details' for 'Methods used in reviews'). For this update, two reviewers (MAOB and GJ, SR, DB or LF) independently assessed the quality of each trial. We resolved any discrepancies by discussion. We assigned an overall rating of high, moderate or low risk of bias for each study, based on the following criteria: concealment of allocation; blinded or objective assessment of primary outcome(s); completeness of follow up (mainly related to follow up of professionals); and no important concerns in relation to baseline measures, reliable primary outcomes or protection against contamination. As a rule of thumb, we assigned a rating of low risk of bias if the first three criteria were scored as done, and there were no important concerns related to the last three criteria; moderate if one or two criteria were scored as not clear or not done; and high if more than two criteria were scored as not clear or not done. For cluster randomisation trials, we rated protection against

contamination as done. We also rated concealment of allocation as done if all clusters were randomised at one time. We rated completeness of follow up as done if the number of clusters that were randomised was reported and there was no indication that any clusters dropped out.

For this update, two reviewers (MAOB and GJ, SR, DB or LF) completed data extraction independently, using a checklist developed by EPOC (see 'Editorial information' under 'Group details' for 'Methods used in reviews') with additional data as noted below for new studies and for data not collected from studies for the previous version of this review.

We defined multi-faceted interventions as including two or more discrete interventions, e.g. EOVs and various supportive services, such as reminders to health professionals given at a different time.

**Description of explanatory factors**

The type of targeted behaviour was categorised as prescribing versus any other behaviour. Baseline compliance with the targeted behaviours was treated as a continuous variable ranging from zero to 100%, based on the experimental group pre-intervention level of compliance. For the factors, the number of clinicians included at each visit, and the number of EOVs, we first examined these data to determine variation across studies to inform the decision to dichotomise or categorise these data. Subsequently, the number of clinicians included at each visit was dichotomised as one or more than one. Similarly, the number of visits was dichotomised as one or more than one. The complexity of the targeted behaviour was categorised in a subjective manner independently by two of us as high, moderate or low. These judgements were based on the number of behaviours required; the extent to which complex judgements or skills were necessary; and whether other factors such as organisational change were required for the behaviour to be improved. Judgements also depended on whether there was need for change only by the individual/professional (one person) or communication change or change in systems. If an intervention was targeted at relatively simple behaviours, but there were a number of different behaviours (e.g. compliance with multiple recommendations for prevention), the complexity was assessed as moderate. The seriousness of outcomes was categorised in a subjective manner independently by two of us as high, moderate or low. Acute problems with serious consequences were considered as high. Primary prevention was considered moderate. Numbers of unspecified tests or prescriptions were considered low. For multi-faceted interventions that included EOVs, two of us independently categorised the contribution of EOVs as a component of the entire intervention in a subjective manner.

We used the following EPOC definitions (www.epoc.uottawa.ca) of interventions directed toward healthcare professionals that were considered to be discrete and separate from EOVs, but were part of the same arm of the trial.

- Patient mediated interventions: any intervention aimed at changing the performance of healthcare providers indirectly by providing information, prompts, or support to the patient; e.g. direct mailings to patients, patient counselling delivered by others, clinical information collected directly from patients and given to the provider.
- Reminders: any intervention, manual or computerised, that prompts the healthcare provider to perform a clinical action.

We also considered organisational and financial interventions that were not part of the EOV (see EPOC (www.epoc.uottawa.ca) for definitions).

**Analysis**

We only included studies of low or moderate risk of bias with baseline measures in the primary analyses. All outcomes in these analyses were expressed as compliance with desired practice. We analysed professional and patient (healthcare) outcomes separately. We did not include patient outcomes in the primary analyses.

When several outcomes were reported in one trial, we only extracted results from the primary outcome. If the primary outcome was not specified or discernable, we calculated effect sizes for each outcome and extracted the median value across the outcomes. In the result tables, we tabulated the median adjusted risk difference (RD) in compliance for the primary outcome for studies that reported an odd number of primary outcomes. For studies that reported an even number of primary outcomes, we chose the higher of the two middlemost adjusted RD in compliance for the primary outcomes. In trials that reported summary as well as individual measures of performance, we used the summary measure.

Because of missing data and unit of analysis errors for continuous outcomes, only dichotomous outcomes were included in the visual and statistical analyses. We also did univariate analysis of continuous outcomes, with the dependent variable as percentage change relative to the control post-intervention score.

We considered the following potential sources of heterogeneity to explain variation in the results of the included studies:

- the targeted behaviour (prescribing versus other behaviours)
- baseline compliance
- the number of clinicians included at each visit (one or more than one)
- the number of EOVs (one or more than one)
- the complexity of the targeted behaviour
- the seriousness of the outcome
- risk of bias (high versus moderate)
- the contribution of EOVs as component of the intervention

We visually explored heterogeneity by preparing tables, bubble and box plots (displaying medians and inter-quartile ranges) to explore the size of the observed effects in relationship to each of these variables. The size of the bubble for each comparison corresponded to the number of healthcare professionals who participated. Each variable was characterised relative to the other variables in the tables, looking at one potential explanatory variable at a time. We looked for patterns in the distribution of the effects, hypothesising that larger effects would be associated with interventions where EOVs were targeted to prescribing behaviours, lower baseline compliance, lower complexity of the targeted behaviour and lower study quality.

We supplemented the visual analyses with multivariate statistical analyses. We used weighted meta-regression to examine how the size of the effect was related to the explanatory variables listed above, weighted according to the number of healthcare professionals. We conducted these analyses using generalised linear modelling in SAS 2003. We conducted the main analysis for the first comparison using the adjusted RD as the measure of effect.

To minimise the risk of spurious estimates of effect from the meta-regression, due to a high number of independent variables compared to the number of studies in the analysis, we performed the meta-regression in a stepwise manner with two steps:

1. We analysed each of the potential explanatory variables as the only independent variable in a meta-regression to assess an unadjusted baseline effect - variables with a p-value > 0.3 were excluded as explanatory variables in step 2.
2. We combined explanatory variables from 1 (p-value <= 0.3) and interactions into the final meta-regression-model.

An extensive check of interaction terms was not possible given all the possible combinations.

Because there were important baseline differences in compliance between the intervention and control groups, our primary analyses were based on adjusted estimates of effect, where we adjusted for baseline differences in compliance. For dichotomous outcomes, we calculated the adjusted RD in compliance as follows:

Adjusted RD equals the difference between intervention and control groups means in compliance after the intervention minus the difference between groups before the intervention. A positive risk difference means that compliance improved more in the educational outreach group than in the control group, e.g. an adjusted risk difference of 0.09 indicates an absolute improvement in practice of 9%. Outcomes that were reported as mean percentages in compliance were treated as dichotomous variables.

For continuous outcomes such as mean number of tests ordered, we calculated post-intervention raw and adjusted mean differences. We also attempted to summarise the relative percentage change attributable to the intervention (adjusted difference between the post-intervention experimental and control group means divided by the post-intervention control group mean x 100).

## DESCRIPTION OF STUDIES

We have added 51 trials to this update, making a total of 69 included studies.

**Characteristics of the providers and settings**

Twenty-three trials were based in North America, 22 in the United Kingdom, 14 in Europe, eight in Australia, two in Indonesia and one in Thailand. In most studies (n = 53), the health professionals were primary care physicians or teams practising in community settings (see table 'Characteristics of included studies'). In six trials, the health professionals were physicians or teams of physicians, nurses and other professionals practicing in hospitals (Hendryx 1998; Martin 2004; Solomon 2001; Soumerai 1993; Steele 1989; Wyatt 1998). Of these, two trials focused on the practice of residents or interns (Solomon 2001; Steele 1989). In one trial, physicians who worked in community or hospitals settings were included (Figueiras 2006). In four trials, the health professionals were physicians, nurses and nursing assistants providing care to patients in nursing homes (Avorn 1992; Crotty 2004; Loeb 2005; Schmidt 1998). In two trials, the providers included pharmacists/owners and counter attendants (Ross-Degnan 1996b; Watson 2002). In two trials, the providers were generic healthcare workers (Pagaiya 2005; Santoso 1996). We found only one trial in which the health professionals were dentists practicing in the community (Brown 1994).

**Targeted behaviours**

In 29 trials, the behaviours were prescribing practices and in 17 of these trials, the goal of the intervention was to decrease inappropriate prescribing. Three trials were targeted at reducing benzodiazepine use (Berings 1994; de Burgh 1995; Zwar 2000). Five trials aimed to reduce inappropriate drug use among the elderly, including psychotrophic medication (Avorn 1992; Crotty 2004; Schmidt 1998; van Eijk 2001) and inappropriate antibiotics for urinary symptoms (Loeb 2005). In nine trials, inappropriate antibiotics were targeted (Avorn 1983; Coenen 2004; Finkelstein 2001; Font 1991; McConnell 1982; Pagaiya 2005; Ross-Degnan 1996b; Santoso 1996; Solomon 2001). In three trials, the goal of the intervention was to increase appropriate prescribing. Wyatt 1998 attempted to increase appropriate prescribing of corticosteroids and antibiotics as well as improve other aspects of care in an antenatal unit. In many trials, the goal of the intervention was to increase prescribing of certain drugs while decreasing prescribing of other types of drugs that were often more costly. For example, Watson 2001 attempted to change the prescribing of three recommended nonsteroidal anti-inflammatory medications (ibuprofen, diclofenac and naproxen).

In 29 trials, the behaviour was the general management of a variety of problems encountered in general practice, e.g. patients at

increased cardiovascular risk, those with asthma or diabetes. In 11 trials, the behaviours were preventive services including counselling for smoking cessation.

**Characteristics of the interventions**

In 41 trials, the visits were held individually in 24 trials group visits were held, and in four trials the number of clinicians who were visited was not clear. In some trials, one-to-one visits were held with physicians and group visits were held with nursing staff (e.g. Avorn 1992; Loeb 2005). Many interventions included feedback either given during the visit or mailed afterward (e.g. Borgiel 1999; Braybrook 1996; Finkelstein 2001; Fretheim 2006; Hendryx 1998; Kim 1999; McConnell 1982; Rabin 1994; Siriwardena 2002; van der Weijden 1999). Twelve trials were based upon a social marketing framework (Soumerai 1989) and the content of the visits was tailored to barriers to change that were assessed in the same or a similar group of clinicians (Avorn 1983; Avorn 1992; Cheater 2006; Figueiras 2006; Fretheim 2006; Ofman 2003; Ross-Degnan 1996b; Santoso 1996; Simon 2005; Soumerai 1993; van der Weijden 1999; Young 2002). In 30 trials, the EOV was one component of a multi-faceted intervention (see definition) that included different strategies directed to health professionals, such as reminders. Several trials tested interventions that were targeted to the practice as a whole and sometimes included practice organisational changes (e.g. Griffiths 2004; Lemelin 2001; Modell 1998). In most trials, one or two visits were made although in one trial (Lemelin 2001), 33 visits were made over the course of the study. In this trial, the EOV was part of an overall strategy directed to the practice. We attempted to determine if the visitor was selected because he/she was deemed to be an influential source, was a peer or was selected for some other reason. For most studies, while the qualifications of the visitor were described, their potential for influence was not mentioned. The trials that were based upon social marketing theory also described the visitor as someone thought to be credible in the eyes of the clinicians. One trial (vanden Hombergh 1999) compared EOVs delivered by a peer versus a non-peer. For further details, see 'Characteristics of included studies' table.

## METHODOLOGICAL QUALITY

In this review, we used the terms 'risk of bias' and 'study quality' as synonyms. We judged 20 trials to be of low risk of bias, 48 of moderate risk of bias, and one trial of high risk of bias (Hennessy 2006). In 41 trials, we assessed that allocation to experimental and control groups was adequately concealed. For all but one of the remaining trials, adequacy of concealment could not be determined from the published reports. Outcomes were assessed blindly in 40 of the 69 studies, with all but four of the remaining studies assessed as not clear from available reports. Follow-up of practices/professionals was generally good, with 54 trials assessed as having over 80% follow up, 11 assessed as not clear and four assessed as having less than 80% follow up of the units randomised.

## RESULTS

**Literature search**

The search of the EPOC register and pending files yielded 142 and 22 studies respectively. Seven studies were included that were identified from other searches. From all sources, we added 53 new studies to this update for a total of 69 studies. Seven studies are awaiting further assessment. In the table 'Characteristics of excluded studies', there are 16 studies including studies that were excluded from the original review, as well as seven studies that were excluded from this update.

**Comparison 1. Any intervention in which EOVs are a component (including educational materials for all comparisons) compared to no intervention (including educational materials)**

In this comparison, there were 62 trials that included either healthcare professional or patient outcomes. There were 56 trials (63 comparisons) with health professional outcomes and six trials (six comparisons) with patient outcomes only. All trials except one were assessed to be at low or moderate risk of bias. Of the 56 trials with health professional outcomes, 37 trials had outcomes that were dichotomous and 19 trials had outcomes that were continuous. Data pertaining to each trial in this comparison can be found in both (dichotomous and continuous) spreadsheets available at www.epoc.uottawa.ca.

***Trials with dichotomous health professional outcomes***

There were 37 trials with health professional outcomes that were dichotomous. Of these, there were 28 trials (34 comparisons) with baseline data that contributed to the calculation of the median and interquartile range. The adjusted RDs in compliance with desired practice varied from -3% to 64%, with a median improvement of 5.6% (interquartile range 3% to 9.0%).

***Meta regression***

We identified 34 comparisons from a total of 28 studies with a dichotomous outcome. Due to lack of information for some of the factors to be included in the meta regression analysis, three of the studies were excluded (Cheater 2006; Fretheim 2006; Frijling 2003). The regression was thus based upon 31 comparisons. Primary explanatory factors were targeted behaviour (prescribing or not), baseline compliance, the number of clinicians included at each visit and the number of visits. Secondary factors were complexity of the behaviour, the seriousness of the outcome, the risk of bias, and the contribution of EOVs as a component of the intervention. Baseline compliance was regarded as a continuous variable, whereas the others were treated as categorical. In the multivariate analyses (Figure 01), none of the factors that we examined provided compelling explanations for the observed variation in the adjusted RDs (P = 0.08 to 0.90 when all eight factors were included). When we only included those factors that we had specified as primary explanatory factors in the analysis (Figure 02), the targeted behaviour (prescribing compared to other behaviours)

was the only factor for which the estimate was statistically significant (P = 0.002), suggesting that on average EOVs had a smaller effect on prescribing than on other behaviours, although there was more variation in the effect on other behaviours. These analyses were limited by the large number of potential explanatory factors (eight) and all the possible interactions among these factors with only 31 comparisons, in addition to these being indirect (between study) analyses.

Inspection of the bubble and box plots for different types of professional performance (Figure 03; Figure 04) suggested that there was less variation and small effects for prescribing (median adjusted RD 4.8%, interquartile range 3.0% to 6.5% for 17 comparisons) compared to other behaviours for which there was wide variation in effects (median adjusted RD 6.0%, interquartile range 3.6% to 16.0 % for 17 comparisons). Inspection of the box plot for comparisons of multi-faceted interventions that included EOVs versus comparisons of EOVs alone (Figure 05) suggests that the effect sizes of trials with multi-faceted interventions (median adjusted RD 8.8%, interquartile range 2.9% to 12.7% for 16 comparisons) were slightly larger compared to trials in which the intervention was an EOV alone (median adjusted RD 5.0%, interquartile range 3.0% to 6.23% for 18 comparisons). However, in the multivariate analysis, the estimate for this factor (multifaceted interventions compared to EOV alone) was not statistically significant (P = 0.90) (Figure 01).

In 15 of 34 comparisons, the adjusted RDs were less than 5%. In 11 comparisons, the adjusted RDs varied from 5% to 9%. In eight comparisons (seven studies), the adjusted RDs were 10% or larger. In six of these studies, the interventions were multi-faceted and none of the outcomes were prescribing.

***Trials with continuous health professional outcomes***

There were 19 trials and 20 comparisons with continuous outcomes. Of these, 17 trials (18 comparisons) had baseline data and contributed to the calculation of the median and interquartile ranges. The adjusted relative percentage change varied from 0% to 617%. The median percentage change was 21% (interquartile range 11% to 41%). In four comparisons, the adjusted relative percentage change was less than 10%. In five comparisons, the relative percentage change was between 10% and 20%, while in nine comparisons the relative percentage change was over 20%. Of the eight studies in which the relative percentage change was greater than 20%, three had multi-faceted interventions and the outcomes were a mix of prescribing and non-prescribing practices.

***Patient outcomes*** (see table 'Characteristics of included studies')

Fourteen trials in this comparison reported patient outcomes (Avorn 1992; Cheater 2006; Crotty 2004; Fretheim 2006; Griffiths 2004; Hendryx 1998; Hennessy 2006; Kerse 1999; Martin 2004; New 2004; Ofman 2003; Pill 1998; Premaratne 1999; Walsh 2005). Overall, there were few studies that reported patient-level improvement, even if there were improvements in health professional practice. In five trials, patient outcomes were measured but health professional practice was not reported (Griffiths 2004; Hennessy 2006; New 2004; Pill 1998; Premaratne 1999). For most studies, it was difficult to determine if there was sufficient power to detect an important difference at the patient level.

Avorn 1992 concluded that reducing the use of antipsychotic drugs in nursing home residents did not adversely affect the overall behaviour and level of functioning, although some negative changes were reported. Cheater 2006 found that patients' quality of life and urinary symptoms did not improve after health professionals received visits designed to improve care for patients with incontinence. Fretheim 2006 reported that EOVs were not found to improve the proportion of patients who achieved treatment goals for blood pressure and lipids. Griffiths 2004 found a 10% improvement (adjusted OR 0.61, 95% CI 0.38 to 0.99) in the number of patients who did not have unscheduled treatment for asthma after clinicians received a multi-faceted intervention and patients received care by a specialist nurse. Hendryx 1998 found that there were statistically non-significant reductions in ICU length of stay, but no differences in mortality after a quality improvement initiative that included EOVs as well as other interventions to improve the care provided to ventilated patients. Kerse 1999 evaluated a program to improve general practitioners' health promotion counselling for elderly patients. They reported that patients' self-reported exercise, frequency of pleasurable activities and health all significantly improved, but that there were no changes in other measures such as functional status and psychological well-being. Martin 2004 reported a 10% improvement (P = 0.058) in patient survival after health professionals received visits promoting the use of an algorithm for nutritional support of critically ill patients. New 2004 found no difference (OR 1.03, 95% CI 0.95 to 1.11, P = 0.52) in the number of practices with patients who achieved targets for blood pressure and hyperlipidaemia. Ofman 2003 found little difference in quality of life and symptom scores of patients with acid-peptic disease, despite improvement in clinicians' practice following a multi-faceted intervention that included EOVs and patient education. Pill 1998 found no differences in patient measures of glycosolated haemoglobin, satisfaction or quality of life in those with non-insulin-dependent diabetes after clinicians received an educational programme that encouraged them to work collaboratively with patients. Premaratne 1999 reported that there was no difference in quality of life of patients with asthma after a program where specially trained nurses visited practices and provided education to patients. Similarly, Walsh 2005 found no difference in the percentage of patients who received colorectal cancer screening among patients who had been enrolled for five years in a health plan after clinicians received an EOV from a well-known clinician.

**Comparison 2. EOVs alone compared to no intervention**

We included 34 trials (37 comparisons) of EOVs alone compared to no intervention. There were 19 trials (21 comparisons) with dichotomous outcomes and 15 trials (16 comparisons) with continuous outcomes. Data pertaining to each trial can be found in the

spreadsheet for this comparison available at www.epoc.uottawa.ca.

***Trials with dichotomous health professional outcomes***

Of the 19 trials (21 comparisons) with dichotomous outcomes, 16 trials (18 comparisons) had baseline data and contributed to the calculation of the median and interquartile range. Across these trials, the median adjusted RD varied from 1% to 20% with a median of 5.0% (interquartile range 3.0% to 6.2%). There were nine comparisons with adjusted RDs less than 5%, eight comparisons with adjusted RDs between 5% and 9%, and one comparison with an adjusted RD that was 10% or larger.

***Trials with continuous health professional outcomes***

Of the 15 trials (16 comparisons) with continuous outcomes, there were 14 trials (15 comparisons) with baseline data that contributed to the calculation of the median and interquartile range. Across these trials, the adjusted relative percentage changes ranged from 0% to 617% with a median of 23% (interquartile range 12% to 39%).

***Patient outcomes***

Two trials in this comparison had patient outcomes (Avorn 1992; Cheater 2006). These data have been summarised in Comparison 1.

**Comparison 3. Any intervention in which EOVs were a component compared to another intervention including audit and feedback and reminders**

***Health professional outcomes***

For this comparison, there were eight trials (12 comparisons) in which the intervention included an EOV and was compared to another type of intervention. In three trials, EOVs and audit and feedback were compared to audit and feedback alone (Borgiel 1999; Braybrook 1996; Siriwardena 2002). Only the trial by Siriwardena 2002 demonstrated a small difference (adjusted RD = 5%) in favour of the group who received both EOVs and audit and feedback interventions. Another trial (Ornstein 2004) compared EOVs and audit and feedback as well as reminders to audit and feedback to improve preventive cardiovascular care in primary care. The group that received multiple interventions was somewhat superior to the group receiving only the audit and feedback (adjusted RD = 6%, P > 0.2). Similarly, Weller 2003 compared EOVs, audit and feedback and educational meetings to audit and feedback alone to improve appropriate prostate-specific antigen testing in family practice. There was a 20% adjusted relative percentage reduction in testing ordering in the group receiving multiple interventions. The study authors reported that the difference between the groups was significant (P value not reported) at six months but not at the twelve month follow-up period. McBride 2000, in a 2x2 factorial design, compared EOVs and a coordinator to improve care for patients with cardiovascular risk factors. The group that received the services of a coordinator as well as an EOV provided better documentation of care (adjusted RD = 39%, P value not reported). In another trial, EOVs were compared to audit and feedback plus a reminder (Steele 1989). In this trial, there were positive effects (adjusted relative percentage improvement of 8%, P value not reported) in the group that received the visits compared to audit and feedback and reminders. In summary, interventions that included EOVs appeared to be slightly more effective than audit and feedback alone. These differences tended to be small, but were roughly the same as the differences between EOVs and no intervention. The only study in which the effects were large incorporated an organisational intervention (prevention coordinator) in addition to EOVs to improve care for patients with cardiovascular risk factors.

***Patient outcomes***

Ornstein 2004 found an adjusted RD of 5.9% (95% CI -0.3 to 12.2) in the percentage of patients achieving blood pressure control after clinicians received an EOV including audit and feedback as well as a reminder.

**Comparison 4. Any comparison of different types of EOVs**

***Health professional outcomes***

Only six studies evaluated different types of visits in head-to-head comparisons (Figueiras 2006; Kaner 1999; Raisch 1990; Simon 2005; van Eijk 2001; vanden Hombergh 1999). In three studies (Figueiras 2001; Simon 2005; van Eijk 2001), EOVs given individually were compared to EOVs given to a group. In one study, group visits decreased the use of highly anticholinergic anti-depressants prescribed for people over the age of 60 years while the individual visits increased the use of less anticholinergic anti-depressants (van Eijk 2001). In the trial by Figueiras 2001, the goal of the intervention was to increase prescribing of recommended non-steroidal anti-inflammatory drugs (NSAIDs) for patients with osteoarthrosis and inflammation. While we found an adjusted RD of 1.4% in favour of individual visits, the authors reported that in a regression analysis, individual visits were nearly three times as effective as group visits. In their analysis, the authors included the monthly trend and the intervention group as variables. In the trial by Simon 2005, there were no statistically significant differences in the percentages of patients receiving a diuretic or beta-blocker for hypertension.

Raisch 1990 studied different ways of presenting the content during a visit. They compared case studies to statistical information and reported that there were no statistically significant differences between the two groups. However, the groups were not balanced at baseline and while both groups reduced inappropriate prescribing, the group receiving the statistical information had a larger reduction (adjusted RD 8.7%, P value not reported) than the group receiving the information presented as a case study.

Kaner 1999 studied the effectiveness of an EOV plus telephone support compared to an EOV alone in implementing a program to reduce problem drinking. They reported that the group receiving the telephone support was more likely to implement the strategy

than either the group receiving the EOV only or the control group. We found a 4% improvement in the unadjusted RD (59% versus 54%, CI could not be calculated).

There was one trial that compared different types of visitors (van-den Hombergh 1999). Visits by physician peers were compared to visits by non-physicians (practice assistants with special training) on 208 indicators. Both groups received feedback during the visits. The authors reported that after one year, improvements were seen in both groups but that the changes were more marked in the group that received the visits by peers. Those receiving peer visits significantly improved on four indicators of collaboration and practice organisation (23%-43% change) while those who received non-physician visits significantly improved on two indicators related to patient records (4% and 133% change).

## DISCUSSION

EOVs with or without the addition of other interventions can be effective in improving practice in the majority of circumstances, but the effect is variable. For studies with dichotomous health professional outcomes, the median adjusted RD was 5.6% (interquartile range 3% to 9%). For studies with continuous health professional outcomes, there was at least a 20% relative improvement in about half of the 20 comparisons. In interpreting these results, it is important to keep in mind the type of behaviour that is desired. Even small changes in inappropriate prescribing might be potentially important when many hundreds of patients are affected (e.g. Mason 2001). On the other hand, as noted in many of the studies, often the post-intervention proportions of desired practice were less than 50% of that desired.

Our findings are similar to those reported by others. Grimshaw 2004 conducted a large systematic review of the effectiveness and efficiency of guideline implementation strategies. As part of their extensive review, they examined the effectiveness of EO interventions when combined with other interventions. For dichotomous measures, they reported a median absolute improvement of 6.0% in performance (range -4% to 17.4%). For continuous measures, they reported a median relative improvement of 15.0% (range 1.7% to 24%).

In a recent Cochrane update of the effectiveness of audit and feedback (Jamtvedt 2006), the authors found a median adjusted RD of 5% (interquartile range 3 to 11). The median improvement in that review is very close to our findings of 5.6%. Another updated Cochrane review of the effect of local opinion leaders reported an absolute decrease in non-compliance of 10% (Doumit 2007), which is also consistent with our findings. Through these updated reviews, it appears that generally when using interventions such as EOVs, audit and feedback or local opinion leaders as quality improvement strategies, we could expect absolute improvements in practice of five to ten.

None of the variables that we had hypothesised to explain the variance in effects were statistically significant. However, these analyses were indirect comparisons (between studies) with limited power to rule out important differences. We had hypothesised that prescribing behaviour would be associated with larger effects, but our results did not confirm our hypothesis. We found instead that the effects on prescribing were small and consistent, whereas the effects on other types of professional behaviour varied widely. We speculated that some of the comparisons for non-prescribing behaviours that had large effects might have targeted behaviours that were fairly easy to improve. When we looked more closely at these studies, the targeted behaviours appeared to be fairly complex in five studies and relatively simple in two studies. However, when we examined the eight comparisons with adjusted RDs of 10% or more, we found that none of these were for prescribing and the intervention was multifaceted in six of these comparisons, suggesting the possibility that characteristics of the interventions might explain the larger effects observed for some non-prescribing behaviours.

In our analyses, we chose to use the RD in compliance rather than the relative risk (RR) because we believed that the RD might be more easily interpreted by both clinicians and researchers, and we had no basis for assuming that the RR would be more consistent across studies, as is often the case for clinical interventions. In our analysis, we adjusted the RD by baseline compliance. We used this approach because small numbers of clusters were randomised in many trials and differences in baseline compliance were common.

There was considerable variation in the types of interventions across the studies, even though many were described as 'detailing' or 'marketing'. Our ability to describe the characteristics of the interventions was dependent on and limited by the level of detail in the published reports. EOVs, even as a single intervention, can be complex because they sometimes include feedback and can be based upon barriers to changing practice. In some trials, EOVs were combined with other interventions. In our main analysis, we included 15 trials that combined EOVs with other interventions to the health professional, including reminders or interventions targeted directly at patients, such as recall clinics. Several previous reviews have reached different conclusions about the effectiveness of multi-faceted interventions compared with simple interventions (e.g., Grimshaw 2004; Wensing 1994; Wensing 1998). In our multivariate analysis, we included the contribution of EOV to the overall intervention as a variable, but it did not help explain the variation in the adjusted RDs. However, multifaceted interventions had a median effect size of 8.8%, while those of EOVs only had a median effect size of 5% and, as noted above, we cannot rule out that multifaceted interventions accounted for some of the larger adjusted risk differences observed for non-prescribing behaviours.

One type of EOV is based upon the work of Soumerai 1990 and uses a social marketing approach to behaviour change that consists

of eight principles. The first principle in the approach appears to be consistent across other models of behaviour change. It consists of interviews to assess the motivation for current practice and barriers to change. Similarly, Green 1988 has described the need for educational diagnosis prior to the design of an intervention. Prochaska 1992 has commented on the importance of determining the individual's stage in the change process and matching the intervention to the stage, although others have argued against this approach. Other principles in a social marketing approach are: developing programs for specific physician targets and their 'opinion leaders'; developing objectives; establishing credibility; encouraging physician participation; using concise educational materials; repeating key messages; and, ideally, providing reinforcement through subsequent visits (Soumerai 1990). It is unclear whether all these principles have been applied when a social marketing approach has been used for EOV, or to what extent each of these contribute to the effectiveness of EOV when applied.

Some visits appear to be based upon persuasion, but their implementation did not seem to follow a systematic approach such as that described by Soumerai 1990. In these visits, the aim appeared to be changing practice by education with a reliance on transmitting information, usually guidelines for appropriate practice. Less common were visits in which the emphasis was on the development of participants' skills through practice. Participants had the opportunity to practice skills and obtain feedback in the practice setting. This process may facilitate a change in performance if a lack of skills is a barrier to change. In some studies, the visits were focused on the education and organisation of the entire practice and often included strategies for case finding and chart reminders. In one such study (Lemelin 2001), the intervention had multiple components with many visits over one year. A process evaluation that accompanied this trial (Baskerville 2001) reported that two components (audit and feedback and reminders to physicians) were viewed as more effective in improving preventive practice as measured by self-report by physicians.

The variation we observed across interventions is potentially problematic for a couple of reasons. Firstly, some researchers have referred to their intervention as 'marketing' or 'detailing', but have not applied the same principles as those described by Soumerai 1990. Differences in intervention design may explain differences in the results but it is difficult to know if differences are related to the interventions or to the study contexts. Secondly, in this review, the contribution of the EOV to the overall intervention varied from study to study making it difficult to disentangle the relative importance of the EOV component in those studies in which EOVs were only part of the intervention (comparisons 1 and 3.)

The importance of the number of EOVs is not clear. In these trials, the frequency of the visits varied from once to weekly visits for 12 months. Because follow-up was short in most trials, it remains uncertain whether and how performance might deteriorate or improve over time. Similarly, the importance of the type of visitor is unclear. In many studies, it was difficult to determine whether or not the visitor would have been credible to those being visited. Young 2003, as part of a cluster randomised trial of EOVs, surveyed 58 general practitioners about the appropriateness of different types of 'visitors'. Seventy-two percent of respondents indicated that another general practitioner (either working clinically or academically and clinically) was viewed as the most appropriate visitor. Visitors seen as less appropriate were pharmacists and researchers. Soumerai 1990 also discussed the importance of the credibility of the visitor. In this review, we attempted to determine the extent that the visitors were chosen because of their potential for influence, but often we did not find sufficient data in the published reports.

In the only study (vanden Hombergh 1999) that directly compared the type of visitor (peer or non-peer), the authors found that visits in which the visitor was a peer seemed to be more effective for certain behaviours related to collaboration with others and practice organisation, but less effective for behaviours related to patient records.

Several studies mentioned the costs of the intervention and potential savings, and two studies reported an economic analysis (Fretheim 2006; Mason 2001). Fretheim 2006 conducted cost-minimisation and cost-effectiveness analyses of a study that increased the use of thiazides in patients who began antihypertensive medication. They reported that the net annual cost was $763 USD per practice and the net annual savings in a national program was modelled to be $540 USD per practice. In all but two sensitivity analyses, the authors reported that the savings exceeded the costs. Although the cost of the intervention was more than twice the savings over the period of the study, they predicted modest savings over a two-year period (Fretheim 2006). Mason 2001 conducted an economic analysis of the trial by Freemantle 2002. By using a framework, they argued that implementation strategies to increase under-used cost-effective care such as ACE inhibitors made economic sense, but that trying to reduce the use of potentially over-used and expensive medication such as SSRIs did not (Mason 2001). Hogg 2005 conducted a cost-consequences analysis of a study that reduced inappropriate screening tests and increased appropriate ones in 22 Canadian primary care practices (Lemelin 2001). They reported that the annual net cost savings to the government was $191,733 (CAD 2003) per year. Presumably, such cost savings would depend on assumptions in the model regarding the benefits of prevention. In a study of prescribing, Steele 1989 reported that the EOV intervention was cost-effective, with a savings of $478 (USD) per physician over seven months after considering the salary of the pharmacist visitor. Ilett 2000 reported prescribing costs, but did not conduct an economic analysis. They reported that antibiotics costs in the control group increased by 48% but that costs in the intervention groups only increased by 35%.

## AUTHORS' CONCLUSIONS

### Implications for practice

EOVs, with or without additional interventions, can be effective in improving health professional practice. The effects are, for the most part, small to moderate, but potentially important. The effects on prescribing are small and consistent (median 4.8%, interquartile range 3.0% to 6.5%) whereas the effect on other professional behaviours is more variable (median adjusted RD 6%, interquartile range 3.6% to 16%). It is not known to what extent performance is likely to deteriorate or improve over time, or whether multiple visits are worth the additional cost. Long-term performance (beyond one year) should be monitored. Although EOVs are reported to be costly, savings may outweigh costs if targeted at inappropriate prescribing and the effects are enduring (Mason 2001; Soumerai 1986). The costs and cost effectiveness of this approach will depend upon targeted behaviours, the comparison that are made and the context in which the interventions are provided.

### Implications for research

There are six ways that further research could help our understanding of EOVs as an intervention to improve health professional practice. Firstly, since EOVs appear to have a consistent effect on prescribing, two-arm trials comparing EOVs to no EOVs for prescribing are unlikely to yield important new findings. Future studies should investigate ways of increasing the effectiveness of EOVs through head-to-head comparisons of different types of EOVs, including the type of visitor and the content of the visits. Visits that occur as part of a sustained effort to improve practice might be more effective and efficient than one-time efforts. This warrants further investigation and such programs offer important opportunities for comparisons between different types of EOVs. In all further investigations of EOVs, including comparisons of different types of EOVs and EOVs compared to no EOVs or other interventions, it is important that investigators report each of the components of the intervention in detail.

Secondly, the effects of EOVs are generally small to moderate, as with other interventions to improve professional practice. Investigators need to power studies sufficiently to detect small effects that are important.

Thirdly, given the complexity of EOVs, process evaluations that are embedded into trials could shed some light on the variable effectiveness of EOVs. For example, a process evaluation was conducted by Baskerville 2001 of the RCT by Lemelin 2001. The goal of the evaluation was to determine the extent to which the intervention was implemented as intended and how the intervention improved practice.

Fourthly, investigators should carefully consider the number and nature of behaviours that are targeted for improvement. In many trials, interventions were targeted at a large number of behaviours or behaviours that appeared to be complex, e.g. a number of steps were required. This may be unrealistic in terms of changes that can be expected, and the results of such trials are often difficult to interpret. Investigators should clearly indicate a primary outcome and should be cautious about targeting a large number of complex behaviours. A related issue is that studies should measure professional performance for which patient outcomes are well documented.

A fifth area for researchers to consider is the relevance of including patient outcomes as well as professional performance. If researchers believe that it is important to measure patient outcomes, then the primary outcome should be both sensitive to change and reflect the underlying disease process.

Lastly, given the costs of EOVs, studies should measure the use of resources and include economic analyses, if EOVs are found to be effective.

In future updates of this review, we will aim to improve the way that we characterise potential explanatory factors that we consider in our analyses and include the results of process evaluations.

## POTENTIAL CONFLICT OF INTEREST

None known.


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* *Indicates the major publication for the study*

# TABLES

## Characteristics of included studies

| **Study** | **Avorn 1983** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: DONE<br>Baseline: NOT DONE for print only group,<br>DONE for outreach group<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 435 US physicians, high prescribers of 3 drugs<br>Proportion of eligible providers who participated:<br>NOT CLEAR<br>Community-based care, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits + tailoring + distribution of educational materials<br>2. Educational materials |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | 3. No intervention control |
| Outcomes | Professional practice:<br>Number of prescriptions/ items of specified drugs<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Avorn 1992** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE (prescribing)<br>Patients: NOT DONE<br>Blinded assessment: prescribing NOT CLEAR, patient status DONE<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | US physicians, nurses and nursing aids and assistants prescribing psychoactive drugs for 823 patients in 6 stratified pairs of nursing homes<br>Proportion of eligible providers who participated: NOT CLEAR<br>Nursing home care, Academic/teaching status NOT CLEAR<br>Type of targeted behaviour: PRESCRIBING<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. Individual EO visits to physicians and group EO visits to nurses + distribution of educational materials + conferences + tailoring<br>2. No intervention control |
| Outcomes | Professional practice: Mean psychoactive drug use<br>Patient: % of residents with stable or improved function<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Berings 1994** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: NOT CLEAR<br>Overall quality:<br>MODERATE |
| Participants | 128 Belgian general practitioners encouraged to reduce benzodiazepine prescribing |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Proportion of eligible providers who participated:28%<br>Community-based care, academic/teaching status: NOT CLEAR<br>Type of targeted behaviour: PRESCRIBING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials<br>2. Distribution of educational materials<br>3. No intervention control |
| Outcomes | Professional practice: Mean number of packages of benzodiazepines per 100 patient contacts with prescription<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Borgiel 1999** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>Patients: NOT CLEAR<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: NOT CLEAR<br>Overall quality:<br>MODERATE |
| Participants | 56 Canadian family and general practitioners.<br>Community-based care. academic/teaching setting: NOT CLEAR<br>Proportion of eligible providers who participated: 57%<br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visit + A&F<br>2. A&F |
| Outcomes | Professional practice: Percentage of quality of care score<br>Patient: satisfaction<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Braybrook 1996** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Overall quality:<br>LOW |
| Participants | 91 UK medical practices. Proportion of eligible providers who participated: 72%<br>Community-based care, Academic/Teaching setting NOT CLEAR<br>Type of targeted behaviour: PRESCRIBING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visit + graphic computer slide show + review of guidelines + A&F<br>2. A&F (individualised workbook + colour graphics identical to computer slide show)<br>3. (self-selected control group) (not randomised) |
| Outcomes | Professional practice: Prescribing indicators for antibiotics and NSAIDS<br>Patient: NONE<br>Seriousness of outcome: LOW |
| Notes | Randomisation was not maintained as some practices moved between groups |
| Allocation concealment | A – Adequate |

| **Study** | **Brown 1994** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: NOT CLEAR<br>Overall quality:<br>MODERATE |
| Participants | 25 Australian dental practices (not employing hygienists) encouraged to provide periodontal care<br>Proportion of eligible providers who participated: 71%<br>Community-based care, academic/teaching status: NOT CLEAR<br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visit + distribution of educational materials + educational meetings (EM) + A&F<br>2. No intervention control |
| Outcomes | Professional practice: Percentage of records containing at least one periodontic notation (diagnostic, preventive or treatment )<br>Patient: NONE<br>Seriousness of outcome: LOW |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Cheater 2006** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>patients: DONE |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 157 family practices (community nurses) in UK; improvement of nursing practice and patient outcomes.<br>Proportion of eligible providers who participated: 29%<br>Primary care; academic/teaching setting: UNIVERSITY BASED<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits (trained nurse)<br>2. A&F (mailed personal feedback)<br>3. EO visits+ A&F<br>4. No intervention control |
| Outcomes | Professional practice: Percentage compliance with criteria for assessment and management of urinary incontinence in primary care<br>Patient: Percentage of patients with improved outcome<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Cockburn 1992** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: NOT DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: NOT CLEAR<br><br>Overall quality:<br>MODERATE |
| Participants | 272 physicians in Australian GP/family practices, encouraged to provide patients with smoking cessation information<br>Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care, academic/teaching status NOT CLEAR<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visit + distribution of educational materials + role playing + 2nd visit to deal with any problems<br>2. Specially trained courier delivered the kit + a personalised letter + instruction + a follow up phone call<br>3. Kit was mailed + personalized letter + instructions |
| Outcomes | Professional practice:<br>Number of physicians using at least one resource<br>Number of resources used overall (help cards, contract cards, quits pack, self-help books)<br><br>Patient: NONE |

| | |
|---|---|
| | Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Coenen 2004** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: NOT DONE<br>patients: N/A<br>Blinded assessment: NOT DONE<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 85 general practitioners, Belgium; to optimise antibiotic prescribing for acute cough.<br>Proportion of eligible providers who participated: 57%<br>Primary care; academic/teaching setting: MIXED<br><br>Type of targeted behaviour: PRESCRIBING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits (pharmacist and former medical representative) + postal reminder + telephone call + printed material<br>2. No intervention control |
| Outcomes | Professional practice: Rate of antibiotic prescribing<br><br>Patient: NONE<br><br>Seriousness of outcome: LOW |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Crotty 2004** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>patients: NOT DONE<br>Blinded assessment: DONE<br>Baseline: NOT DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | Physicians, nurses and aids in 20 residential facilities, Australia; encouraged to practice evidence based residential care. Proportion of eligible providers who participated: 81%<br>Residential care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: General management of a problem<br>Complexity of targeted behaviour: HIGH |
| Interventions | 1. EO visits (pharmacist) to physicians and to staff separately + education of one nurse per facility<br>2. No intervention control |

| | |
|---|---|
| Outcomes | Professional practice: Percentage prescriptions of any psychotropic medication, recorded blood pressure readings, percentage of residents at risk of stroke and on aspirin and percentage of residents with atrial fibrillation recorded on warfarin<br><br>Patient: Percentage fall rate three months prior to assessment<br><br>Seriousness of outcome: HIGH |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Dey 2004** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: NOT DONE<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 24 primary care teams in UK, to implement guidelines for low back pain. Proportion of eligible providers who participated: 53%<br>Primary care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: General management of a problem Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits (representatives from the musculoskeletal directorate, physiotherapy services and the health authority) + access to a fast-track physiotherapy service + access to a back clinic<br>2. No intervention control |
| Outcomes | Professional practice: Percentage of referrals to X-rays, sickness certificates, prescribed opiods, to secondary care and to physiotherapy or educational programme<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Diwan 1995** |
|---|---|
| Methods | RCT<br>Allocation concealment: DONE<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | Physicians in 134 Swedish family practices encouraged in appropriate use of lipid lowering drugs for 1308 patients |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care, non academic/teaching status<br>Type of targeted behaviour: PRESCRIBING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials<br>2. No intervention control |
| Outcomes | Professional practice:<br>Number of prescriptions<br>Mean number of prescriptions per month, per health care centre<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Feder 1995** |
|---|---|
| Methods | RCT<br>Allocation concealment: DONE<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: NOT DONE*<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | 39 physicians in 24 UK inner city general practices encouraged to comply with guidelines for the management of asthma and diabetes<br>Proportion of eligible providers who participated: 55%<br>Community-based care, non-academic/teaching status<br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: HIGH |
| Interventions | 1. EO visits + distribution of educational materials (guidelines) plus reminders for asthma management<br>2. EO visits + distribution of educational materials (guidelines) plus reminders for diabetes management<br>Note one group served as the control for the other group |
| Outcomes | Professional practice:<br>Percentage of patients receiving appropriate care for asthma and diabetes<br>Patient: NONE<br>Seriousness of outcome: HIGH |
| Notes | * Prompts (stamps) were used in the medical records of the intervention group only thereby resulting in a difference in how information was collected before and after the intervention<br>** Note one group served as the control for the other group |
| Allocation concealment | B – Unclear |

| **Study** | **Fender 1999** |
|---|---|
| Methods | RCT |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Allocation concealment: DONE<br>Follow-up: NOT DONE<br>Blinded assessment: NOT CLEAR<br>Baseline: NOT CLEAR<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 100 general practices in the UK providing care for women with menorrhagia<br>Proportion of eligible providers who participated: 33% of practices<br>1001 completed data sheets<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials + reminder ( flow sheet)<br>2. Control group received monitoring visit at 6 months |
| Outcomes | Professional practice: Proportion of referrals, use of tranexamic and use of norethisterone and use of mefenamic acid<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | * or adjusted for fund holding status, training practice status, rural vs urban, list size, branch surgery, proportion male partners, obstetric list qualifications & those returning more or less than 10 data sheets |
| Allocation concealment | A – Adequate |

| **Study** | **Figueiras 2001** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 190 Spanish family practitioners.<br>Proportion of eligible providers who participated: 80%<br>Community-based care, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials + 82% received reminder<br>2. EO visit to group + distribution of educational materials<br>3. No intervention control |
| Outcomes | Professional practice: Rate of prescribed units vs other NSAIDs<br><br>Patient: NONE |
| Notes | |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| Allocation concealment | A – Adequate |

| **Study** | **Figueiras 2006** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 6451 physicians in 15 spatial clusters (hospitals and outpatient centres) in Portugal; to improve physician reporting of adverse drug reactions. Proportion of eligible providers who participated: 100% Primary care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + reminder card<br>2. No intervention control |
| Outcomes | Professional practice: Adverse drug reaction reporting rates before and after intervention<br>Patient: NONE<br>Seriousness of outcome: HIGH |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Finkelstein 2001** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: NOT CLEAR<br>Patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 12 US practices.<br>Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visit (in groups) + distribution of educational materials + distribution of patient information + second EO visit (contained feedback and recommendations)<br>2. No intervention control |
| Outcomes | Professional practice: Rate of antibiotic courses dispensed to children 3 months to > 36 months and 36 months to >72 months |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Patient: NONE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Font 1991** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow-up: NOT CLEAR<br>Blinding: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR Contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 244 Spanish physicians encouraged to reduce prescribing of cerebral and peripheral vasodilators and antibiotics<br>Proportion of eligible providers who participated: 57%<br>Community-based care. academic/teaching status: NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits + educational materials<br>2. No intervention control |
| Outcomes | Professional practice:<br>Mean number of packages per MD per month<br><br>Patient: NONE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Freemantle 2000** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: NOT CLEAR providers:<br>Patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | Proportion of eligible providers who participated: 72%<br>Community-based care, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials<br>2. No intervention control |
| Outcomes | Professional practice: Proportion of prescriptions reimbursed for lansoprazole against proton pump inhibitors as a whole |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Patient: NONE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Freemantle 2002** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: NOT CLEAR<br>Patients: N/A<br>Blinded assessment: DONE<br>Baseline: NOT CLEAR<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 12 UK practices.<br>Proportion of eligible providers who participated: 70%<br>Community-based care, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits + distribution of educational materials<br>- Each practice recived an outreach for two out of four guidelines |
| Outcomes | Professional practice: Proportion of patients treated in accordance with each guideline<br><br>Patient: NONE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Fretheim 2006** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 146 general practices in two geographical areas in Norway, 501 physicians; to encourage rational prescribing in prevention of cardiovascular disease. Proportion of eligible providers who participated: 38%<br>Primary care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits (pharmacists) + A&F + computerised reminders<br>2. No intervention control |
| Outcomes | Professional practice: Percentage prescriptions of thiazides<br>Patient: Percentage of patients having reached treatment goals |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Frijling 2003** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 124 practices in the Netherlands; improvement of clinical decision making in cardiovascular care. Proportion of eligible providers who participated: 79% Primary care; academic/teaching setting: Mixed<br><br>Type of targeted behaviour: General management of a problem Complexity of targeted behaviour: HIGH |
| Interventions | 1. EO visits (trained facilitators) + A&F to practitioners + educational materials and support to providers<br>2. No intervention control |
| Outcomes | Professional practice: Mean changes in compliance rates for 12 evidence-based indicators for the actual management of patients at high cardiovascular risk<br>Patient: (reported in other studies)<br>Seriousness of outcome: HIGH |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Griffiths 2004** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>patients: DONE<br>Blinded assessment: DONE<br>Baseline: NOT DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 42 UK general practices; to reduce unscheduled asthma care. Proportion of eligible providers who participated: 100%<br>Primary care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: General management of a problem<br>Complexity of targeted behaviour: HIGH |
| Interventions | 1. EO visits (specialist nurse) + computer reminders + patient education<br>2. EO visits + check of patients + usual care |
| Outcomes | Professional practice: NONE<br>Patient: Percentage of unscheduled asthma care |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Seriousness of outcome: HIGH |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Hall 2001** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 76 UK practices.<br>Proportion of eligible providers who participated: 96%<br>Community-based care, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials<br>2. Distribution of educational materials |
| Outcomes | Professional practice: The prescribing differences between omeprazole and metronidazole<br>Patient: NONE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Hendryx 1998** |
|---|---|
| Methods | RCT<br>Allocation<br>concealment: NOT CLEAR<br>Follow-up: DONE<br>Blinded assessment: NOT CLEAR<br>Reliable outcomes: DONE<br>Baseline: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | US physicians and nurses in rural ICUs providing care for mechanically ventilated patients. 20 hospitals<br>Proportion of eligible providers who participated: NOT CLEAR<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br><br>Complexity of targeted behaviour: HIGH |
| Interventions | 1. EO visits (university-based team of specialists) + A&F to practitioners + summary feedback letter to hospital administration and directors + educational materials + invitations to seminars + telephone consultation service<br>2. distribution of educational materials |
| Outcomes | Professional practice: |

| | |
|---|---|
| | Percentage process compliance (7 variables and total)<br>Patient:<br>Nosocomial events per 100 ICU days<br>Mortality rate<br>Discharge home rate<br>Resource use: (3 variables) |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Hennessy 2006** |
|---|---|
| Methods | RCT<br>Allocation<br>concealment: NOT DONE<br>Follow-up: NOT CLEAR<br>Blinded assessment: DONE<br>Reliable outcomes: NOT CLEAR<br>Baseline: DONE<br>Protection against contamination: NOT CLEAR<br><br>Overall quality:<br>LOW |
| Participants | Physicians and nurse practitioners in family medicine, internal medicine and obstetrics-gynecology, USA; to improve hypertension control. 93 providers and their patients Proportion of eligible providers who participated: NOT CLEAR Mixed setting; Academic/Teaching setting: University based<br><br>Type of targeted behaviour: General management of a problem Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits (clinical pharmacist) + A&F to practitioners + educational materials to providers and patients<br>2. No intervention control |
| Outcomes | Professional Practice: NONE<br>Patient: Proportion of patients achieving blood pressure control Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Ilett 2000** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: DONE<br>Baseline: NOT DONE<br>Reliable outcomes: DONE<br>Protection against contamination: NOT CLEAR<br><br>Overall quality:<br>MODERATE |
| Participants | 112 Australian general practitioners.<br>Proportion of eligible providers who participated: 80%<br>Community-based care, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: MEDIUM |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| Interventions | 1. EO visits + distribution of educational materials<br>2. No intervention control |
| Outcomes | Professional practice: Reducing antibiotic prescriptions<br>Patient: NONE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Kaner 1999** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: NOT DONE<br>Patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: NOT CLEAR<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | 128 UK general practitioners.<br>Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care, academic/teaching setting NOT CLEAR<br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials + set up and demonstrated program + phone calls every 2 weeks<br>2. EO visit + distribution of educational materials + set up and demonstrated program<br>3. Distribution of educational materials |
| Outcomes | Professional practice: Percentage of implementation of the 'drink less' program<br>Patient: NONE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Kerse 1999** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>Patients: DONE<br>Blinded assessment: DONE<br>Baseline: NOT CLEAR<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br>Overall quality:<br>HIGH |
| Participants | 42 Australian general practitioners.<br>Proportion of eligible providers who participated: 51%<br>Community-based care, academic/teaching setting NOT CLEAR<br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visit + A&F + reminder + didactic seminar + distribution of educational materials<br>2. No intervention control |
| Outcomes | Professional practice: Percentage of patients who reported being asked about exerise<br>Patient: self-reported exercise,social contact, well-being, functional status, number of drugs taken, influenza vaccination status |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Kim 1999** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | 41 US primary care physicians.<br>Proportion of eligible providers who participated: 84%<br>Community-based care, academic/teaching setting NOT CLEAR<br>Type of targeted behaviour: PREVENTIVE CARE<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials + A&F<br>2. Distribution of educational materials |
| Outcomes | Professional practice: Percentage of preventive care services<br>Patient: NONE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Lemelin 2001** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes:DONE<br>Protection against contamination: DONE<br>Overall quality:<br>HIGH |
| Participants | 46 Canadian health service organisations.<br>Proportion of eligible providers who participated: 48%<br>Community-based care, academic/teaching setting NOT CLEAR |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Type of targeted behaviour: PREVENTIVE CARE<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visit + distribution of educational materials + local consensus process + patient mediated interventions + A&F + reminders + patient educational materials<br>2. No intervention control |
| Outcomes | Professional practice: Overall index of preventive performance, an up-to-datedness index and an inappropriateness index.<br>Patient: NONE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Loeb 2005** |
|---|---|
| Methods | RCT<br>Allocation<br>concealment: DONE<br>Follow-up: DONE<br>Blinded assessment: DONE<br>Reliable outcomes: NOT CLEAR<br>Baseline: NOT DONE<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | Physicians, nurses and nursing assistants at 24 nursing homes in Canada and US; improvement of prescribing in suspected urinary tract infections.<br>Proportion of eligible allocation units who participated: 43%<br>Setting was nursing homes; Academic/Teaching setting: NON-TEACHING<br>Type of targeted behaviour: PRESCRIBING Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits (study investigators) + reminders + algorithms + educational material<br>2. No intervention control |
| Outcomes | Professional practice: Number of prescriptions for antimicrobials<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Martin 2004** |
|---|---|
| Methods | RCT<br>Allocation<br>concealment: DONE<br>Follow-up: DONE<br>Blinded assessment: DONE<br>Reliable outcomes: DONE<br>Baseline: DONE<br>Protection against contamination: DONE<br>Overall quality:<br>HIGH |
| Participants | Mixed staff at 11 community and 3 teaching hospitals; to improve nutritional support in intensive care units. |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Proportion of eligible allocation units who participated: NOT CLEAR<br>Hospital setting; academic/teaching setting: Mixed<br><br>Type of targeted behaviour: General management of a problem Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits (opinion leaders) + AF to practitioners + daily support service by a dietician + paper material:algorithms for proper treatment and pocket cards<br>2. No intervention control |
| Outcomes | Professional practice: NONE<br><br>Patient: Percent hospital mortality<br>Seriousness of outcome: HIGH |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **McBride 2000** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow up:<br>providers: DONE<br>patients: N/A<br>Blinded assessment: NOT DONE<br>Reliable outcomes: DONE<br>Baseline: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 160 US primary care physicians and 29 staff<br>Proportion of eligible allocation units who participated: 100%<br>academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: PREVENTIVE CARE<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits<br>2. Prevention coordinator + conference calls<br>3. Both<br>4. Educational meeting (all groups received the educational meeting) |
| Outcomes | Professional practice: Percentage of patients with screening recorded<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **McConnell 1982** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: NOT DONE<br>Reliable outcomes: DONE |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Protection against contamination: NOT CLEAR<br><br>Overall quality:<br>MODERATE |
| Participants | 35 US physicians prescribing tetracycline for upper respiratory infection in Medicaid patients<br>Proportion of eligible providers who participated: 22% (responsible for 62% of all prescriptions)<br>Care setting NOT CLEAR, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + A&F + educational materials<br>2. No intervention control |
| Outcomes | Professional practice:<br>Number of physicians prescribing tetracycline for upper respiratory tract infection<br>Median number of prescriptions per prescriber<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Modell 1998** |
|---|---|
| Methods | RCT<br>Allocation concealment:<br>DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: NOT CLEAR<br><br>Overall quality:<br>MODERATE |
| Participants | 26 general practices in the UK providing care for patients at risk of being carriers for haematological disorders<br>Proportion of eligible providers who participated: 28% of practices.<br>academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br><br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits by nurse facilitator + patient educational materials + reminder (laminated card) plus educational meetings<br>2. No intervention control |
| Outcomes | Professional practice: Number of haemoglobino-<br>pathy screening requests per practice per year<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

**Characteristics of included studies** (*Continued*)

| **Study** | **Myers 2004** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow-up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: NOT DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 318 primary care practices: 470 physicians, USA; to improve colorectal cancer screening.<br>Proportion of eligible providers who participated: 80%<br>Primary care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: SCREENING<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits (nurse specialist) + A&F + telephone call<br>2. No intervention control |
| Outcomes | Professional practice: Rate of recommendations for colorectal diagnostic evaluation<br>Patient: Percentage of patients performing colorectal diagnostic evaluation rates<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **New 2004** |
|---|---|
| Methods | RCT<br>Allocation concealment: Done<br>Follow-up: providers: DONE<br>patients: NOT CLEAR<br>Blinded assessment: DONE<br>Baseline: NOT DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 44 general practices: 167 nurses and physicians, UK; to improve control of hypertension and hyperlipidaemia.<br>Proportion of eligible providers who participated: NOT CLEAR<br>Primary care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: HIGH |
| Interventions | 1. EO visits (nurse) + printed material on hypertension<br>2. EO visits (nurse) + printed material on hyperlipidemia |
| Outcomes | Professional practice: NONE<br><br>Patient: Percentage of patients achieving acceptable blood pressure and lipid level<br><br>Seriousness of outcome: HIGH |
| Notes | |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| Allocation concealment | A – Adequate |

| **Study** | **Newton-Syms 1992** |
|---|---|
| Methods | RCT<br>Allocation concealment: DONE<br>Follow-up: providers DONE<br>patients N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 318 UK general practitioners encouraged to alter prescribing of NSAIDs<br>Proportion of eligible providers who participated: 75%*<br>Community-based care, academic/teaching status NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials<br>2. No intervention control |
| Outcomes | Professional practice: Median prescribing index*<br><br>Seriousness of outcome: LOW |
| Notes | * Proportion in the intervention group. The control group did not receive any notification of the study<br><br>** ratio of the cost of prescribing the recommended NSAID to the cost of more expensive NSAIDs plus the recommended NSAID |
| Allocation concealment | A – Adequate |

| **Study** | **Ofman 2003** |
|---|---|
| Methods | RCT<br>Allocation concealment: Done<br>Follow-up: providers: DONE<br>patients: DONE<br>Blinded assessment: DONE<br>Baseline: NOT DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 8 geographically separate physician offices, 83 providers: nurses, pharmacists, physicians, USA; to improve the management of patients with acid-peptic disease.<br>Proportion of eligible providers who participated: 95% Primary care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits (physician champion; pharmacists) + Education of nurses and pharmacists + Patient educational intervention and follow-up of patients by nurses |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | 2. No intervention control |
| Outcomes | Professional practice: Percentage improvements in 6 process of care measures<br>Patient: SF-12 total score and symptom score<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Ornstein 2004** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow-up: providers: DONE<br>patients: DONE<br>Blinded assessment: DONE<br>Baseline: NOT DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | 20 community-based family or general internal medicine practices in 14 states in USA; improvement of preventive cardiovascular care. Proportion of eligible providers who participated: NOT CLEAR Primary care; academic/teaching setting: NOT CLEAR<br>Type of targeted behaviour: General management of a problem Complexity of targeted behaviour: HIGH |
| Interventions | 1. EO visit + A&F + network meetings<br>2. No intervention control |
| Outcomes | Professional practice: Percentage of performance targets achieved<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Pagaiya 2005** |
|---|---|
| Methods | RCT<br>Allocation concealment: Done<br>Follow-up: providers: DONE<br>patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | Staff at 18 primary health centres led by nurses, Thailand; to improve quality of care.<br>Proportion of eligible providers who participated: 100% Community-based care; academic/teaching setting: NOT CLEAR<br>Type of targeted behaviour: PRESCRIBING Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visit (nurse supervisor) + education<br>2. No intervention control |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| Outcomes | Professional practice: Percentage of antibiotic prescribing for all patients<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Pill 1998** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow-up: providers DONE (assumed)<br>patients DONE<br>Blinded assessment: DONE (psychological measures); NOT CLEAR (chart extraction)<br>Baseline: DONE (except for Hospital B for glycosated Hb<br>Reliable outcomes: DONE (psychological measures); NOT CLEAR (chart extraction)<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | 29 UK general practices (nurses, physicians)<br>providing care for patients with NIDDM<br>Proportion of eligible providers who participated: 88%<br>Community-based care, academic/teaching status: Non teaching but linked to university<br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits (to practice nurses) + educational meetings + distribution of educational materials<br>2. No intervention control |
| Outcomes | Professional practice:<br>Percentage of consultations where key behaviours took place<br>Patient: (primary outcomes) mean differences in:<br>glycolated Hb; patient satisfaction, SF36 |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Premaratne 1999** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>Patients: DONE<br>Blinded assessment: NOT CLEAR<br>Baseline: NOT CLEAR<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: NOT CLEAR<br>Overall quality:<br>MODERATE |
| Participants | 41 UK practices with a practice nurse.<br>Proportion of eligible providers who participated: 91%<br>Community-based care, academic/teaching setting NOT CLEAR<br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits + distribution of educational materials<br>2. No intervention control |
| Outcomes | Professional practice: NONE<br>Patient: The difference in the mean square root in quality of life between intervention and control practices in the treatment of asthma.<br>Seriousness of outcome: HIGH |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Putnam 1985** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow up: providers: NOT CLEAR<br>patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: NOT CLEAR<br>Reliable outcomes: DONE<br>Protection against contamination: NOT CLEAR<br>Overall quality:<br>MODERATE |
| Participants | 16 physicians from Canadian practices, providing treatment for 5 conditions<br>Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care, academic/teaching status NOT CLEAR<br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits + AF + local consensus processes + educational materials<br>2. No intervention control |
| Outcomes | Professional practice:<br>Mean compliance with criteria<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Rabin 1994** |
|---|---|
| Methods | RCT<br>Allocation concealment: DONE<br>Follow up: providers: NOT DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: NOT CLEAR<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: NOT CLEAR<br>Overall quality:<br>MODERATE |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| Participants | 194 US physicians given information advice about the prevention of sexually transmitted diseases; 194 episodes of care<br>Proportion of eligible providers who participated: 60%<br>Community-based care, non-academic/teaching status<br>Type of targeted behaviour: PREVENTIVE CARE<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + patient mediated intervention + distribution of educational materials (including audio) + A&F<br>2. Distribution of educational materials (including audio)<br>3. No intervention control |
| Outcomes | Professional practice:<br>Risk questioning of patients about:<br>Condom use<br>Number of sexual partners.<br>Advice to use condoms<br>Advice to limit number of sexual partners<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Raisch 1990** |
|---|---|
| Methods | RCT<br>Allocation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: NOT CLEAR<br>Overall quality:<br>HIGH |
| Participants | 24 US physicians, nurses and physician assistants prescribing anti-ulcer drugs for outpatients in 187 episodes of care<br>Proportion of eligible providers who participated: NOT CLEAR<br>Community/based care, university/teaching setting: NOT CLEAR<br>Type of targeted behaviour: PRESCRIBING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials (vivid condition)<br>2. EO visits + distribution of educational materials (non vivid condition)<br>3. No intervention control (non-randomised) |
| Outcomes | Professional practice:<br>Inappropriate prescribing per practitioner<br>Cost of inappropriate prescribing per practitioner<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| Allocation concealment | A – Adequate |

| **Study** | **Ross-Degnan 1996b** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | Pharmacists and counter attendants in 87 private pharmacies in Indonesia encouraged to provide appropriate therapy for patients with acute diarrhoea<br>Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care, non academic/teaching status<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + tailoring + distribution of educational materials + patient-mediated intervention<br>2. No intervention control |
| Outcomes | Professional practice:<br>Mean percentage of patient visits receiving oral rehydration solution<br>Mean percentage of patient visits receiving antidiarrhoeals<br>Mean percentage of patient visits receiving antimicrobials<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | In this paper, two studies were reported, one in Indonesia and one in Kenya. Only the Indonesian study is included in this review. See excluded trials table. |
| Allocation concealment | B – Unclear |

| **Study** | **Santoso 1996** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE (oral hydration, antimicrobials, polypharmacy) NOT DONE (antidiarrhoeals)<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | Medical and non-medical prescribers in 90 health centres in 6 districts in Indonesia encouraged to provide appropriate management for patients with acute diarrhoea<br>Proportion of eligible providers who participated: 100%<br>Community-based care, academic/teaching status: NOT CLEAR<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + tailoring + distribution of educational materials<br>2. Seminar + distribution of educational materials<br>3. No intervention control |
| Outcomes | Professional practice:<br>Mean percentage of patients prescribed oral rehydration solution<br>Mean percentage of patients prescribed antimicrobials<br>Mean percentage of patients prescribed antidiarrhoeals<br>Mean number of drugs per case<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Schmidt 1998** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: NOT CLEAR<br>Patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 33 Swedish nursing homes<br>Proportion of eligible providers who participated: 91%<br>Community-based care, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits + distribution of educational materials + team meetings + local consensus process<br>2. Distribution of educational materials |
| Outcomes | Professional practice: Quality and quantity of psychotropic drug prescribing<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **SimkinSilverman 1997** |
|---|---|
| Methods | RCT<br>Allocation<br>concealment<br>NOT CLEAR<br>Follow up:<br>providers: DONE<br>patients: N/A |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Blinded assessment: DONE<br>Baseline assessment: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality: MODERATE |
| Participants | 11 US physicians in community private practice who specialised in internal medicine or family practice.<br>Proportion of eligible providers who participated: 2.2%.<br>One physician per practice as well as one designated staff member.<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits (2 hours of individual training) + distribution of educational materials + role playing + patient educational materials + reminder<br>2. No intervention control |
| Outcomes | Professional practice:<br>Percentage of patients by physician group and assessment period whose weight and BMI were measured.<br>Mean patient motivation rating<br>Mean physician counselling score.<br>Percentage of patients who received specific types of advice and information from their physician during visit.<br><br>Patient: NONE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Simon 2005** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality: MODERATE |
| Participants | 9 practice sites in a large health maintenance organisation in USA for improvement of the use of antihypertensive medications. Proportion of eligible providers who participated: 16%<br>Primary care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visit (trained peer leader) to individual physicians |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | 2. EO visit (trained peer leader) to groups<br>3. No intervention control |
| Outcomes | Professional practice: Percentage change in guideline adherence<br>Patient: Not complete<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Siriwardena 2002** |
|---|---|
| Methods | RCT<br>Allocation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline assessment: DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br>Overall quality: MODERATE |
| Participants | 30 UK general practices<br>Proportion of eligible providers who participated: 34%<br>Community-based care, academic/teaching status: NOT CLEAR<br>Type of targeted behaviour: PREVENTIVE CARE<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visit + AF to primary care team<br>2. A&F |
| Outcomes | Professional practice: Percentage of vaccination rates<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Solomon 2001** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: NOT CLEAR<br>patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Reliable outcomes: DONE<br>Protection against contamination: NOT DONE<br><br>Overall quality:<br>MODERATE |
| Participants | Interns in a US hospital<br>Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care, academic/teaching setting<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials<br>2. No intervention given |
| Outcomes | Professional practice: The number of days that unnecessary levofloxacin or ceftazidime was administered in intervention and control groups.<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | 17 medical services were randomised no doctors. Interns received an outreach visit if they prescribed a targeted unnecessary medication |
| Allocation concealment | A – Adequate |

| **Study** | **Soumerai 1993** |
|---|---|
| Methods | RCT<br>Allocation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | Physicians from 4 US hospitals providing 1449 episodes of care for selected surgical and medical patients requiring transfusions<br>Proportion of eligible providers who participated: 100%<br>Inpatient care, mixed academic/teaching settings<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br><br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits + distribution of educational materials + conferences + marketing<br>2. No intervention control |
| Outcomes | Professional practice:<br>Number of transfusions undertaken that met explicit criteria<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

**Characteristics of included studies** (*Continued*)

| **Study** | **Steele 1989** |
|---|---|
| Methods | RCT<br>Allocation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: NOT CLEAR<br><br>Overall quality:<br>HIGH |
| Participants | 34 residents and fellows in 1 US hospital encouraged to use efficient prescribing practices for outpatients.<br>Proportion of eligible providers who participated: 100%<br>Outpatient care, university based/teaching setting<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits + reminders<br>2. Audit and feedback + reminders<br>3. No intervention control |
| Outcomes | Professional practice:<br>Mean responses to written suggestions<br>Mean cost per prescription fill rate<br>Mean number of prescriptions<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Taylor 1999** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: NOT CLEAR<br>Patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: NOT CLEAR<br><br>Overall quality:<br>MODERATE |
| Participants | 49 US physicians<br>Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PREVENTIVE CARE<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials + reminders<br>2. No intervention given |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| Outcomes | Professional practice: Mammography completion within 8 weeks of clinic visits.<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Walsh 2005** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>patients: NOT DONE<br>Blinded assessment: DONE<br>Baseline: NOT DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | 94 community primary care physicians in USA promoting the use of colorectal cancer screening tests.<br>Proportion of eligible providers who participated: NOT CLEAR<br>Primary care; academic/teaching setting: MIXED<br>Type of targeted behaviour: SCREENING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visit (opinion leaders) + Patient intervention: Mailed educational material and a fecal occult blood testing kit<br>2. No intervention control |
| Outcomes | Professional practice: Physician screening rates<br>Patient: Colorectal cancer screening rates<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Watson 2001** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br>Overall quality:<br>HIGH |
| Participants | 20 UK practices<br>Proportion of eligible providers who participated: 39%<br>Community-based care, academic/teaching setting NOT CLEAR<br>Type of targeted behaviour: PRESCRIBING |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials<br>2. Distribution of educational materials<br>3. No intervention given |
| Outcomes | Professional practice: Change in the volume of prescribing for ibuprofen, diclofenac and naproxen as a percentage of total NSAID prescribing.<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **Watson 2002** |
|---|---|
| Methods | RCT<br>Randomisation concealment:<br>DONE<br>Follow-up providers: DONE<br>Follow-up patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: NOT DONE<br>Protection against contamination: DONE<br>Overall quality:<br>HIGH |
| Participants | 60 UK pharmacies<br>Proportion of eligible providers who participated:<br>50.4%<br>Community-based care, academic/teaching setting NOT CLEAR<br>Type of targeted behaviour: PRESCRIBING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visit + educational meeting + guidelines<br>2. EO visit + guidelines<br>3. Educational meeting +guidelines<br>4. Guidelines only |
| Outcomes | Professional practice: Percentage of visits with appropriate sale or non-sale of antifungal product<br>Patient: NONE<br>Seriousness of MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Weller 2003** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE |

| | |
|---|---|
| | Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 82 general practices in Australia, promotion of better use of prostate-specific antigen testing.<br>Proportion of eligible providers who participated: 27%<br>Primary care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: SCREENING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visit (trained clinical pharmacist) + A&F + educational material<br>2. Mailed A&F information and educational material<br>3. No intervention control |
| Outcomes | Professional practice: Prostate-specific antigen testing rates<br><br>Patient: NONE<br><br>Seriousness of outcome: LOW |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Witt 2004** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 100 general practices: 185 physicians, Denmark; to optimise prescribing of asthma medication for children.<br>Proportion of eligible providers who participated: 100%<br>Primary care; academic/teaching setting: NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visit (investigator) + A&F + printed material<br>2. Mailed A&F + printed material |
| Outcomes | Professional practice: NONE<br>Patient: Daily doses of steroids sold/bought; B2-agonists sold/bought<br><br>Seriousness of outcome: HIGH |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Wyatt 1998** |
|---|---|
| Methods | RCT<br>Allocation concealment: DONE |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Follow-up providers: NOT CLEAR<br>patients: N/A<br>Blinded assessment: DONE<br>Baseline: DONE<br>NOT DONE for ventouse<br>Reliable outcomes: NOT DONE (chart)<br>DONE (labour ward)<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 25 obstetrical units with more than 1500 deliveries per year<br>Proportion of eligible providers who participated: 96%<br>Hospital-based care<br><br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits (Cochrane module, video, slides, feedback on labour guidelines, audit targets)<br>2. No intervention control |
| Outcomes | Professional practice: Antibiotics in Caesarian section<br>Ventouse<br>Polyglycolic stitches<br>Steroids in preterm delivery<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Young 2002** |
|---|---|
| Methods | RCT (Incomplete balanced block design)<br>Allocation concealment: DONE<br>Followup providers: DONE<br>Follow-up patients: N/A<br>Blinded assessment: DONE<br>Baseline: NOT DONE<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>MODERATE |
| Participants | 60 Australian family physicians from 39 practices<br>Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care<br><br>Type of targeted behaviour: PREVENTIVE CARE<br><br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + tailoring + A&F + reminders + patient mediated<br>2. Control |
| Outcomes | Professional Practice:<br>1. Percentage of patients asked about smoking<br>2. Percentage of patients asked about cervial screening |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **Zwar 2000** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: NOT CLEAR Baseline: NOT CLEAR<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | 157 Australian general practitioners.<br>Proportion of eligible providers who participated: 81%<br>Community-based care, academic/teaching setting NOT CLEAR<br>Type of targeted behaviour: PRESCRIBING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visits + distribution of educational materials<br>2. EO visits + distribution of educational materials (on a different topic) |
| Outcomes | Professional practice: Rate of benzodiazepine prescribing for all indications<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **de Burgh 1995** |
|---|---|
| Methods | RCT<br>Allocation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE for new anxiety diagnoses; NOT DONE for new insomnia diagnoses<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | 286 Australian general practitioners encouraged to reduce benzodiazepine prescribing<br>Proportion of eligible providers who participated: 45%<br>Community-based care, academic/teaching status NOT CLEAR<br>Type of targeted behaviour: PRESCRIBING<br>Complexity of targeted behaviour: LOW |
| Interventions | 1. EO visit + distribution of educational materials + patient mediated intervention |

**Characteristics of included studies** (*Continued*)

| | |
|---|---|
| | 2. No intervention control |
| Outcomes | Professional practice:<br>Mean prescribing rate per 100 diagnoses<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **van Eijk 2001** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: NOT CLEAR<br>patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: DONE<br>Reliable outcomes: DONE<br>Protection against contamination: NOT CLEAR<br><br>Overall quality:<br>MODERATE |
| Participants | 190 GPs and 37 pharmacists in the Netherlands<br>Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care, academic/teaching setting NOT CLEAR<br><br>Type of targeted behaviour: PRESCRIBING<br><br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits to individuals including AF + distribution of educational materials<br>2. EO visits in groups including AF + distribution of educational materials<br>3. No intervention control |
| Outcomes | Professional practice: Number of elderly people (> or = 60 years) with new prescriptions of highly anti-cholinergic anti-depressants (HAA) and less anticholinergic antidepressants (LAA).<br><br>Patient: NONE<br><br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

| **Study** | **van der Weijden 1999** |
|---|---|
| Methods | RCT<br>Randomisation concealment: DONE<br>Follow up: providers: DONE<br>Patients: N/A<br>Blinded assessment: DONE<br>Baseline: NOT CLEAR<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br><br>Overall quality:<br>HIGH |
| Participants | 32 Dutch general practitioners from 20 practices. |

| | |
|---|---|
| | Proportion of eligible providers who participated: NOT CLEAR<br>Community-based care, academic/teaching setting NOT CLEAR<br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits + tailoring + AF + educational materials + reminders<br>2. Educational materials |
| Outcomes | Professional Practice: Odds ratio for appropriate cholesterol case finding<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | A – Adequate |

| **Study** | **vanden Hombergh 1999** |
|---|---|
| Methods | RCT<br>Randomisation concealment: NOT CLEAR<br>Follow up: providers: DONE<br>patients: N/A<br>Blinded assessment: NOT CLEAR<br>Baseline: NOT CLEAR<br>Reliable outcomes: NOT CLEAR<br>Protection against contamination: DONE<br>Overall quality:<br>MODERATE |
| Participants | 90 Dutch general pracitioners from 68 practices<br>Proportion of eligible providers who participated: 83%<br>Community-based care, academic/teaching setting NOT CLEAR<br>Type of targeted behaviour: GENERAL MANAGEMENT OF A PROBLEM<br>Complexity of targeted behaviour: MEDIUM |
| Interventions | 1. EO visits by peer + A&F + educational meeting + EO to peer<br>2. EO visit by non peer + A&F + educational meeting |
| Outcomes | Professional practice: 208 indicators of practice management<br>Patient: NONE<br>Seriousness of outcome: MODERATE |
| Notes | |
| Allocation concealment | B – Unclear |

A&F - Audit and feedback;
EO - Educational outreach
N/A - Not aplicable
NIDDM - Non-insulin dependent diabetes mellitus
NSAIDs - Non-steroidal anti-inflammatory drugs
RCT - Randomised controlled trials
vs - versus

## Characteristics of excluded studies

| **Study** | **Reason for exclusion** |
|---|---|
| Baker 2001 | Could not disentangle the effects of educational outreach visits |

**Characteristics of excluded studies** (*Continued*)

| | |
|---|---|
| Betz-Brown 2000 | Visitor was part of the same organisation at the same site |
| Dietrich 1992 | Not educational outreach |
| Dolovich 1999 | Not professional practice |
| Hampshire 1999 | No data in paper |
| Joseph 2004 | Aim of study was organisational change |
| Katzelnick 2000 | Not an educational outreach visit |
| O'Halloran 2004 | Aim of study was organisational change |
| Ray 1985 | Follow up to 1993 study |
| Ray 1986 | Allocation to intervention was not randomised |
| Ray 1987 | Allocation to intervention was not randomised |
| Ray 1993 | Allocation to intervention was not randomised |
| Ross-Degnan 1996a | Allocation to intervention was not randomised |
| Schaffner 1983 | Allocation to intervention was not randomised |
| Stergachis 1987 | Visitor was part of the same organisation at the same site |
| Trap 2001 | Not professional practice |

## GRAPHS AND OTHER TABLES

This review has no analyses.

## INDEX TERMS

**Medical Subject Headings (MeSH)**

*Education, Medical, Continuing; Health Personnel [*education]; *Outcome Assessment (Health Care); Patient Compliance; Physician's Practice Patterns; Professional Practice [*standards]

**MeSH check words**

Humans

## COVER SHEET

| | |
|---|---|
| **Title** | Educational outreach visits: effects on professional practice and health care outcomes |
| **Authors** | O'Brien MA, Rogers S, Jamtvedt G, Oxman AD, Odgaard-Jensen J, Kristoffersen DT, Forsetlund L, Bainbridge D, Freemantle N, Davis DA, Haynes RB, Harvey EL |
| **Contribution of author(s)** | MAOB, GJ, SR, DB and LF independently assessed study quality and completed data extraction. JO-G, DTK , and AO contributed to the statistical analyses. DTK designed the figures. All authors provided comments on the protocol or text of the review. MAOB, AO, NF, DD, RBH and EH contributed to the initial publication of the review. |
| **Issue protocol first published** | 1996/2 |
| **Review first published** | 1997/4 |
| **Date of most recent amendment** | 22 August 2007 |
| **Date of most recent SUBSTANTIVE amendment** | 20 August 2007 |

| | |
|---|---|
| **What's New** | In this updated review, we investigated whether different factors influence the effectiveness of educational outreach visits (EOVs). Similarly, we investigated whether adding another intervention to EOVs alters their effectiveness since some reviews have suggested that multi-faceted interventions are more effective than simple interventions while more recent reviews have reported that multi-faceted interventions do not appear to be any more effective than simpler interventions. |
| **Date new studies sought but none found** | Information not supplied by author |
| **Date new studies found but not yet included/excluded** | Information not supplied by author |
| **Date new studies found and included/excluded** | 20 August 2007 |
| **Date authors' conclusions section amended** | 20 August 2007 |
| **Contact address** | Ms Mary Ann O'Brien<br>Research Fellow<br>Supportive Cancer Care Research Unit<br>Juravinski Cancer Centre<br>699 Concession Street<br>Hamilton<br>Ontario<br>L8V 5C2<br>CANADA<br>E-mail: maryann.o'brien@hrcc.on.ca<br>Tel: +1 905 387 9711<br>Fax: +1 905 575 6308 |
| **DOI** | 10.1002/14651858.CD000409.pub2 |
| **Cochrane Library number** | CD000409 |
| **Editorial group** | Cochrane Effective Practice and Organisation of Care Group |
| **Editorial group code** | HM-EPOC |

## GRAPHS AND OTHER TABLES

**Figure 01.**

Table 1: Results of multivariate analysis including all (primary and secondary) explanatory factors for the adjusted risk difference[1]

| Explanatory factor | Estimate | 95% Confidence Limits | | P Value |
|---|---|---|---|---|
| Prescribing (versus other behaviours)[2] | -2.83 | -7.98 | 2.32 | 0.265 |
| Baseline compliance[3] | 2.43 | -6.59 | 11.45 | 0.580 |
| One clinician per visit (versus more than one)[2] | 1.60 | -2.14 | 5.33 | 0.384 |
| One visit (versus more than one)[2] | 4.45 | -0.76 | 9.66 | 0.090 |
| High complexity (versus low)[4] | 1.87 | -6.59 | 10.33 | 0.650 |
| Moderate complexity (versus low)[4] | 6.50 | 0.72 | 12.28 | 0.029 |
| High seriousness (versus low)[4] | 5.90 | -4.10 | 15.91 | 0.233 |
| Moderate seriousness (versus low)[4] | -1.14 | -6.81 | 4.52 | 0.678 |
| High study quality (versus moderate)[2] | -1.78 | -5.51 | 1.95 | 0.331 |
| Multifaceted (versus not multifaceted)[2] | 0.43 | -6.28 | 7.14 | 0.8955 |

[1] One factor at a time was removed from the complete model in a stepwise manner by excluding the least significant variable each time. The final model was composed of factors significant at a prespecified 30 % level.
[2] Dichotomous variables
[3] Continuous variable (percent)
[4] Categorical variable with three levels

## Figure 02.

Table 2: Results of multivariate analysis including only primary explanatory factors for the adjusted risk difference[1]

| Explanatory Factor | Estimate | 95% Confidence Limits | | P Value |
|---|---|---|---|---|
| Prescribing versus other behaviours[2] | -7.08 | -11.41 | -2.75 | 0.002 |
| Baseline compliance[3] | 2.02 | -8.98 | 13.03 | 0.709 |
| One clinician per visit (versus more than one)[2] | -1.08 | -5.32 | 3.15 | 0.604 |
| One visit (versus more than one)[2] | 0.14 | -4.55 | 4.85 | 0.951 |

[1] As in Table 1, one factor at a time was removed from the complete model in a stepwise manner by excluding the least significant variable each time. The final model was composed of factors significant at a prespecified 30 % level.
[2] Dichotomous variables
[3] Continuous variable (percent)

**Figure 03.**

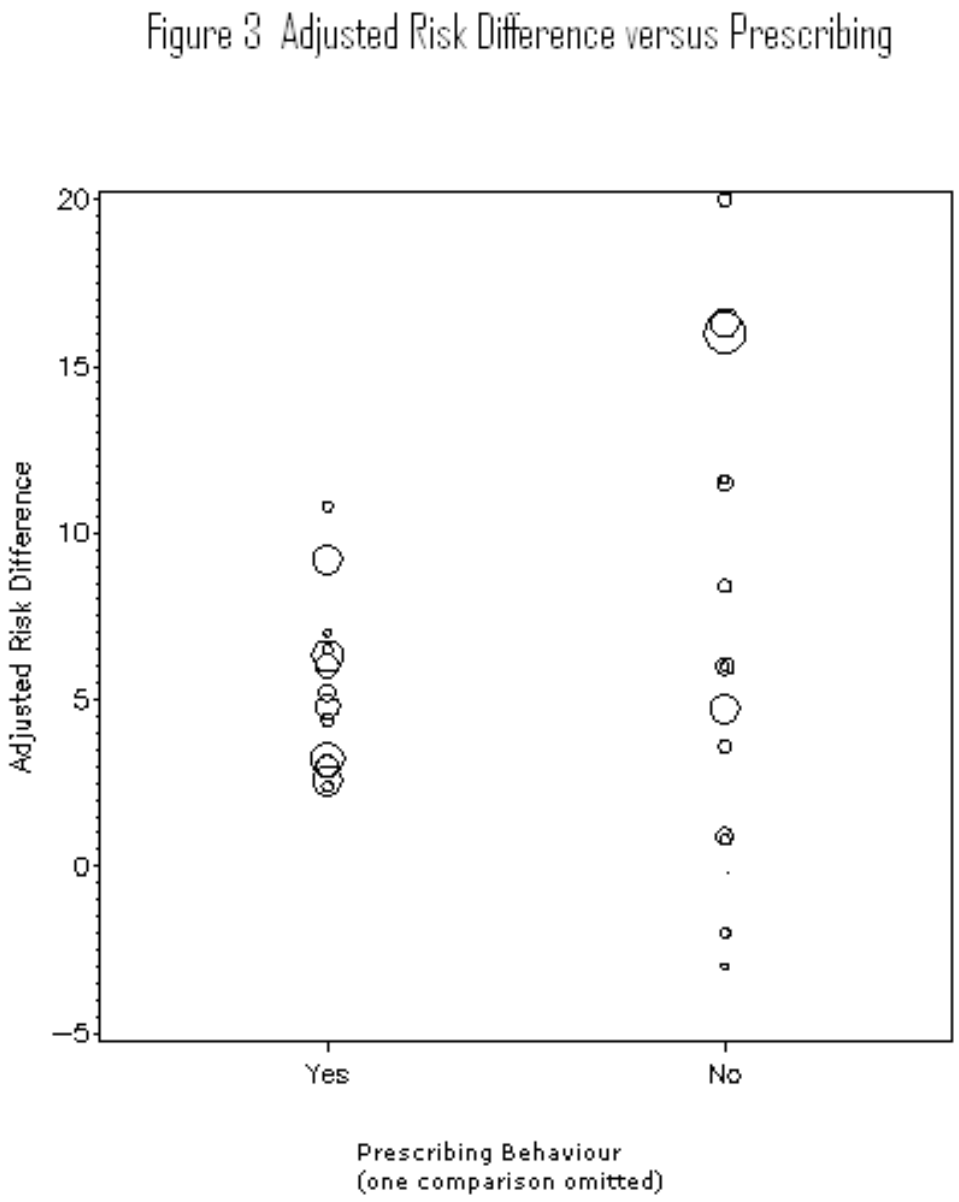

**Figure 04.**

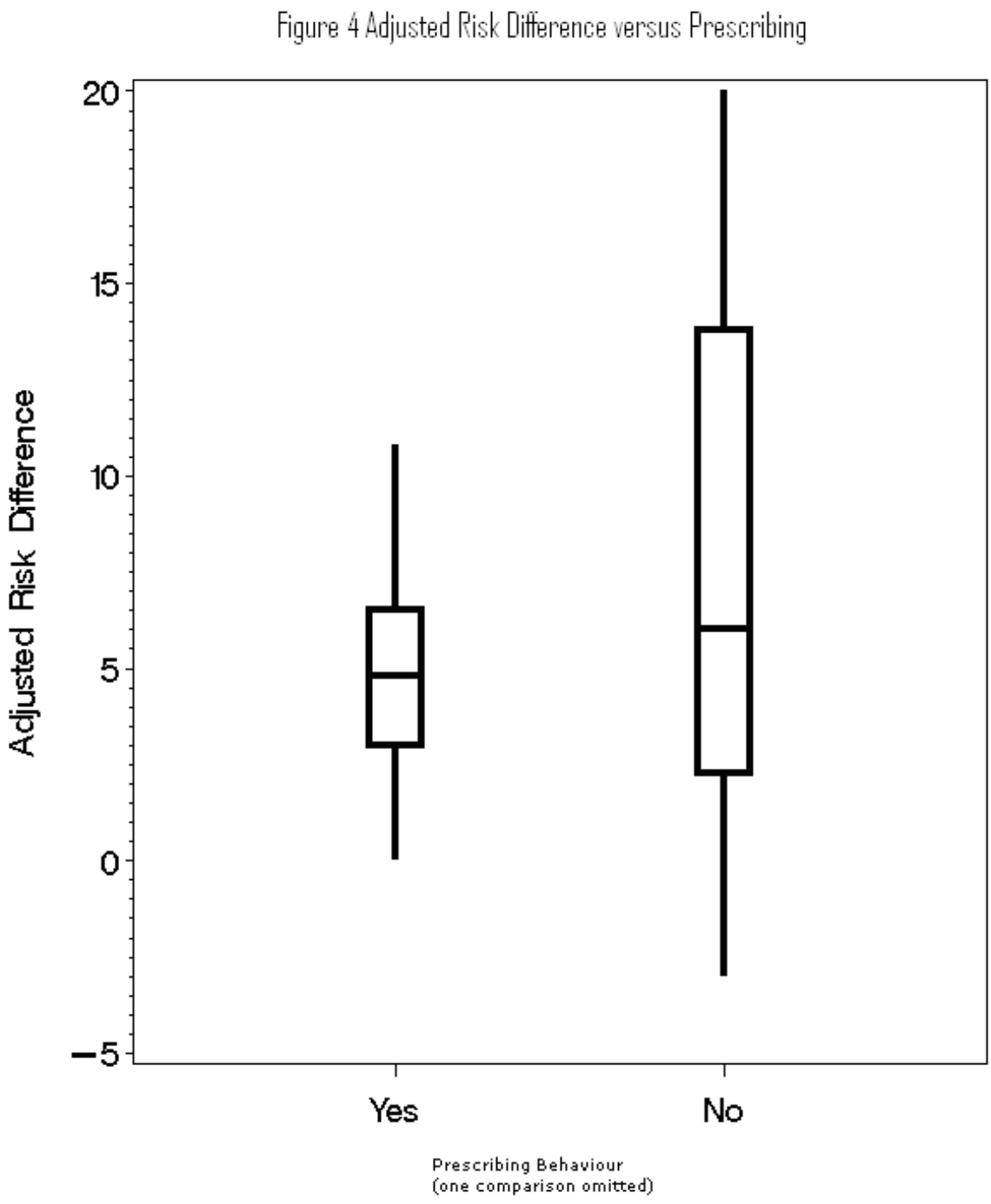

**Figure 05.**