Strategies to increase the delivery of smoking cessation treatments in primary care settings: a systematic review and meta-analysis

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CRD summary
The review concluded that multi-component interventions improved smoking cessation outcomes in primary care settings. No single-component intervention helped to improve the delivery of five basic smoking-cessation strategies (5As). Some methodological problems of the review and the variable quality of included studies limit the reliability of the authors' conclusions.

Authors' objectives
To determine the effectiveness of interventions that increase the delivery of evidence-based smoking-cessation interventions in patients in primary care settings.

Searching
MEDLINE was searched to January 2009 for articles published in English. Search terms were reported. Reference lists of screened articles were handsearched.

Study selection
Randomised controlled trials (RCTs) and controlled before-and-after studies of smoking cessation interventions delivered in primary care to adults (aged 18 years or over) were eligible for inclusion. Studies had to report primary care practitioner performance on one or more of the five basic smoking-cessation strategies (5As - Ask, Advice, Assess, Assist, and Arrange, as defined in the review) and/or smoking abstinence; data had to be sufficient to calculate odds ratios. Studies were excluded if they evaluated smoking cessation medication only, evaluated simple advice or counselling as delivered by clinics, evaluated outcomes by self-report, included patients that were pregnant, or if the smoking status follow-up was assessed within six months of the intervention.

The included studies considered various intervention types including patient level, practice level, practitioner level, system level, and multi-component (as defined in the review). Control groups included no intervention, mailed self-help material, usual/standard care, physician advice, no training, general advice, no reminder, or electronic medical/health records. Half of the studies were conducted in the USA.

Two reviewers independently performed study selection.

Assessment of study quality
Quality assessment was based on a subset of the CONSORT (Consolidated Standards of Reporting Trials) criteria, with estimates of the use of a biochemical validation of smoking abstinence and loss to follow-up of more than 20%.

The authors did not state how many reviewers undertook quality assessment.

Data extraction
The reviewers independently extracted data on smoking abstinence and the 5As. Data were used to calculate odds ratios (ORs) with 95% confidence intervals (CIs). Differences between reviewers were resolved through discussion. Primary authors were contacted for further details, where necessary.

Methods of synthesis
A fixed-effect meta-analysis was undertaken to obtain pooled odds ratios and 95% confidence intervals. Studies using cluster randomisation were included in the meta-analysis using patient level data and adjusted using the intra-class correlation coefficient. When the intra-class correlation coefficient was not provided, sensitivity analyses were used to determine the impact of low and high intra-class correlation coefficient values on outcomes. Heterogeneity was
assessed using $I^2$. Sensitivity analysis was conducted for non-randomised studies versus RCTs.

**Results of the review**

Thirty-seven studies (of 38 comparisons) were included in the review, comprising 10 patient-level RCTs, two quasi-RCTs at patient level, two physician-level cluster RCTs, one physician-level quasi-RCTs, 13 practice-level cluster RCTs, and 10 before-and-after controlled studies (numbers of study designs differed slightly between the tables on descriptions of included studies). Duration of follow-up ranged from eight weeks to five years, where reported. The quality of the included studies was variable; many studies had a loss-to-follow-up of more than 20%, few trials used blinding, and many of the cluster RCTs did not report adjustment for clustering.

**Multi-component interventions** (10 studies): Compared with control, multi-component interventions significantly increased the smoking abstinence rate (OR 2.19, 95% CI 1.71 to 2.79; $I^2$=72%; seven studies). There was also evidence that multi-component had statistically significant effects on most components of the 5As.

**Patient-level interventions** (10 studies): Compared with control, adjuvant counselling significantly increased the smoking abstinence rate (OR 1.73, 95% CI 1.48 to 2.01; $I^2$=37%; seven studies). There was also limited evidence that adjuvant counselling had some effects on components of the 5As but not on all components. The evidence for tailored print materials was limited (two studies), but appeared to indicate a statistically significant benefit on smoking abstinence. Sensitivity analyses showed that results remained significant for adjunct counselling for smoking abstinence, but results were no longer significant for tailored print materials for smoking abstinence.

**Practitioner-level interventions** (four studies): Compared with control, training did not significantly increase the smoking abstinence rate (two studies), or the Ask component of the 5As (one study). There was also mixed evidence for performance feedback on the 5As, but with some evidence of statistical heterogeneity (two studies).

**Practice-level interventions** (12 studies): There was mixed evidence for practice-level interventions on smoking abstinence and the 5As.

**System-level interventions** (two studies): There was limited evidence (one study) that provider incentives did not significantly increase smoking abstinence, and had mixed effects on certain aspects of the 5As.

Other results were provided in the review.

**Authors' conclusions**

Multi-component interventions improved smoking cessation outcomes in primary care settings. None of the single component interventions seemed to improve the delivery of the five basic smoking-cessation strategies (5As - Ask, Advice, Assess, Assist, and Arrange).

**CRD commentary**

Inclusion criteria for the review were broadly defined. The search was limited to one database and one other relevant source. There was the potential for language bias, as only English language articles were included. Publication bias was not formally assessed and could not be ruled out. Attempts were made to reduce reviewer error and bias during study selection and data extraction, but it was unclear if such attempts were made for quality assessment.

Study quality assessment indicated the variable quality of the included evidence. A fixed-effect meta-analysis was undertaken, but there was evidence of substantial heterogeneity in the analysis of multi-component interventions; a random-effects meta-analysis may have been more appropriate. The authors acknowledged heterogeneity as a limitation. There were also wide confidence intervals for some results. Most outcomes only included a small number of studies.

Some methodological problems of the review and the variable quality of included studies limit the reliability of the authors' conclusions.

**Implications of the review for practice and research**
Practice: The authors did not state any implications for practice.

Research: The authors stated that future trials should attempt to isolate which components of multi-component interventions are required to optimise cost-effectiveness and to validate the value of specific single-component interventions, such as adjuvant counselling, provider feedback, real-time provider prompts, and cost-free medications. For single-component interventions, further research is needed on the effects of interventions on the 5As. Future studies should be high quality and should ensure intra-class correlation coefficient values are reported and sample size calculations and analyses account for cluster design.

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