# Practice costs of implementing guidelines for asthma and angina: findings from a randomised controlled trial

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## ABSTRACT

We collected information about the costs of three interventions (dissemination of full guidelines or prioritised review criteria or criteria plus feedback) to improve care of adults with stable angina or asthma within the context of a randomised controlled trial. The cost of criteria with feedback was £180 per practice compared to £9.60–31.45 for the other interventions. Total mean costs borne by practices varied between £838 and £2127 per practice depending upon disease and intervention type.



**Keywords**
angina; asthma; feedback; practice guidelines; randomised controlled trials.



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## INTRODUCTION

National guidelines are being disseminated in England and Wales and in Scotland, although the impact on clinical practice is yet to be fully determined. The implementation of guidelines is known to be difficult. Various implementation methods may be used, but their effectiveness is unpredictable. Implementation also has resource implications. To make rational decisions about the use of guidelines, better information is needed about both the effectiveness and costs of implementation methods. Therefore, in this paper we report the costs of the interventions used in a trial of guideline implementation.

## METHOD

The trial methods are described in detail elsewhere.[1] In brief, 81 practices in the East of England were randomised to receive one of three interventions for each of two study conditions — stable angina and asthma in adults. The interventions were guidelines alone, guidelines presented as prioritised review criteria alone, or review criteria with feedback. The guidelines were those developed by the North of England Evidence-based Guidelines Group,[2,3] and the criteria were derived directly from them. The effectiveness of the interventions was assessed by collection of data both before the interventions and 12 months later; data about the process of care came from clinical records and patient questionnaires, and outcome data from administration of disease-specific symptom questionnaires. No advantage was found for any intervention group.

All costs were calculated using 1999/2000 £ sterling, without discounting as all costs measured would occur within 1 year. The costs of the guidelines included actual cost of purchase, printing and mailing. The staff time needed to develop criteria from the guidelines was estimated by interviewing the researcher and GP involved. For research staff the cost was calculated from their salary plus on-costs, and for the GP, a standardised cost per hour was used.[4]

The data collection costs for the practices that received feedback were estimated by the time needed

by the study data collectors (including travel time, identification of patient sample, and data collection). The costs used were those of a qualified nurse, adjusted to include on-costs.[5] The costs incurred by practice staff in helping identify patients were also included. In addition, 1 hour of a researcher's time was required to prepare the feedback for each practice.

At the end of the intervention period, a structured interview was administered to the member of staff in each practice — usually the practice manager — responsible for the organisation of the study in the practice. The interview included questions about time spent in practice meetings to plan implementation, costs of additional training, staff time involved in leading or carrying out implementation plans, and other costs. Interviewees were asked to distinguish between temporary and continuing time commitments. An allowance for routine on-costs was made, although overheads for general practice running costs or costs incurred while obtaining professional qualifications were excluded.[6] Patient records were used to identify asthma- and angina-related healthcare resource use, and a postal questionnaire to identify costs to patients.

## RESULTS

The costs of providing the three interventions are shown in Table 1. Interviews of practice leads were completed in all 81 practices. The costs incurred by the practices are shown in Table 2. Both mean and median costs are shown, as the mean provides information about overall costs to the health service and the median shows the costs to be anticipated by a practice.

## How this fits in

Many countries now have national guideline development programmes, including NICE in England and Wales, and SIGN in Scotland. An increasing number of studies have investigated the effectiveness of methods of implementing guidelines, but there is relatively little information on the costs of implementing guidelines in general practice. We collected information about the true costs to practices of implementation methods in a randomised trial of various approaches to the care of patients with asthma or angina. Feedback was the most costly implementation method, but although the costs incurred by most practices were small, some practices spent several thousands of pounds on implementation activities.

**Table 1. The cost of providing the interventions — guidelines, prioritised criteria or criteria plus feedback (total number of practices = 81).**

| Intervention | Asthma | Angina |
|---|---|---|
| Guidelines | | |
| Total purchase cost (£) | 791.23 | 849.24 |
| Practices (*n*) | 27 | 27 |
| Mean cost per practice (£) | 29.30 | 31.45 |
| Prioritised criteria | | |
| Development time (£) | 397.74 | 397.74 |
| Cost of printed cards (£) | 122.64 | 154.31 |
| Total for audit criteria (£) | 518.38 | 551.05 |
| Practices (*n*) | 54 | 54 |
| Mean cost per practice (£) | 9.60 | 10.20 |
| Feedback | | |
| Data collection costs (£) | 152.14 | 152.14 |
| Provision of feedback (£) | 17.93 | 17.93 |
| Practices (*n*) | 27 | 27 |
| Audit criteria/practice (£) | 9.60 | 10.20 |
| Mean total cost per practice (£) | 179.67 | 180.29 |

*Values are 1999/2000 £ sterling.*

**Table 2. Mean and median costs (£ sterling) borne by practices implementing guidelines for asthma and angina.[a]**

| | Mean cost in £ sterling (95% CI) | | | | | Median cost in £ sterling (IQR) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Intervention group | Meetings in practice | Practice lead | Other practice Training | Other practice costs | Total | Meetings in practice | Practice lead | Other practice Training | Other practice costs | Total |
| Asthma | | | | | | | | | | |
| Guidelines | 79 (9 to 49) | 1136 (262 to 2011) | 425 (-289 to 1139) | 23 (-9 to 56) | 1664 (312 to 3016) | 12 (0–59) | 255 (1–1375) | 0 (0–93) | 0 (0–0) | 676 (143–1522) |
| Criteria | 21 (0 to 42) | 549 (38 to 1060) | 792 (-191 to 1776) | 2 (-2 to 5) | 1364 (122 to 2605) | 0 (0–19) | 0 (0–713) | 0 (0–470) | 0 (0–0) | 230 (6–1486) |
| Criteria with feedback | 17 (5 to 29) | 181 (-54 to 416) | 679 (57 to 1301) | 0 (0 to 0) | 877 (111 to 1643) | 6 (0–30) | 0 (0–33) | 106 (0–811) | 0 (0–0) | 219 (6–1375) |
| Angina | | | | | | | | | | |
| Guidelines | 80 (-41 to 202) | 727 (-233 to 1686) | 31 (-35 to 97) | 0 (0 to 0) | 838 (-296 to 1973) | 15 (0–35) | 0 (0–451) | 0 (0–0) | 0 (0–0) | 45 (0–471) |
| Criteria | 26 (1 to 50) | 2015 (-1336 to 5367) | 83 (-41 to 206) | 4 (-3 to 11) | 2127 (-1216 to 5470) | 7 (0–20) | 0 (0–230) | 0 (0–15) | 0 (0–0) | 125 (0–788) |
| Criteria with feedback | 67 (-25 to 160) | 955 (-18 to 1928) | 14 (-5 to 33) | 7 (-4 to 17) | 1043 (52 to 2034) | 13 (0–30) | 0 (0–303) | 0 (0–0) | 0 (0–0) | 26 (0–618) |

[a]*Values are 1999/2000 £ sterling. IQR = interquartile range.*

There were no significant differences between study interventions in the total costs to the NHS or patients of implementing guidelines for either asthma or angina. The mean annual NHS costs for angina (£431–565 between the three intervention groups) were higher than mean annual costs for asthma (£211–256). The mean patient-borne costs were £15–41 for asthma and £39–60 for angina.

## DISCUSSION

General practices regularly receive guidelines from both local and national sources. We have shown that in addition to the direct costs of delivering guideline implementation strategies, there are additional costs to practices themselves. Most practices spent relatively little on implementation, but some spent several thousands of pounds. Agencies seeking to implement guidelines should be aware of the potential costs to practices, and practices should take account of the costs to them of their own implementation activities.

We found that the less costly approaches restricted to dissemination of guidelines or criteria were equally effective as the more costly use of feedback. The use of costly methods of implementing guidelines cannot be justified unless there is evidence that they are more cost-effective. Limited evidence about the cost-effectiveness of implementation methods is currently available, and future studies should include investigation of costs, including those incurred by the targeted providers such as general practices.

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### Ethics committee

The study was approved by the following research ethics committees: Leicestershire, Lincolnshire North and South, Northamptonshire, North Derbyshire, Nottingham and North Nottinghamshire.

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## REFERENCES

1. Baker R, Fraser RC, Stone M, *et al.* Randomised controlled trial of the relative impact of guidelines, prioritised review criteria and feedback on the implementation of recommendations for angina and asthma in general practice. *Br J Gen Pract* 2003; **53:** 284–291.
2. North of England Evidence-based Guideline Development Project. *The primary care management of asthma in adults. 97. Evidence based clinical practice guideline.* Newcastle upon Tyne: Centre for Health Services Research, 1999.
3. North of England Evidence-based Guideline Development Project. *The primary care management of stable angina. 98. Evidence Based Clinical Practice Guideline.* Newcastle upon Tyne: Centre for Health Services Research, 1999.
4. Netten A, Dennett J, Knight J. *Unit costs of health and social care.* Canterbury: Personal and Social Services Research Unit, University of Kent, 1999.
5. Anonymous. Database. *MedEconomics* 1999; **20(4):** 101–111.
6. Government Statistical Service. *Regional Trends 34.* London: The Stationary Office, 1994.

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