

The impact of a general practice group intervention on prescribing costs and patterns

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SUMMARY

Background: The formation of primary care groups (PCGs) and trusts (PCTs) has shifted the emphasis from individual practice initiatives to group-based efforts to control rising prescribing costs. However, there is a paucity of literature describing such group initiatives. We report the results of a multilevel group initiative, involving input from a pharmaceutical adviser, practice comparison feedback, and peer review meetings.

Aim: To determine the impact of a prescribing initiative on the prescribing patterns of a group of general practices.

Design of study: A comparative study with non-matched controls.

Setting: Nine semi-rural/rural practices forming a commissioning group pilot, later a PCG, in Southern Derbyshire with nine practices as controls.

Method: Practice data were collated for overall prescribing and for therapeutic categories, between the years 1997/1998 and 1998/1999 and analysed statistically. Prescribing expenditure trends were also collated.

Results: Although both groups came well within their prescribing budgets, in the study group this was for the first time in five years. Their rate of increase in expenditure slowed significantly following the initiative compared with that of the comparison group, which continued to rise (median practice net ingredient cost/patient unit (nic/PU) increase: £0.69 and £3.80 respectively; $P = 0.03$). The study group's nic/PU dropped below, and stayed below, that of the comparison group one month after the start of the initiative. For most therapeutic categories the study group had lower increases in costs and higher increases in percentage of generic items than the comparison group. Quality markers were unaffected.

Conclusion: We suggest that practices with diverse prescribing patterns can work together effectively within a PCT locality to control prescribing costs.

Keywords: commissioning; primary care group; prescribing patterns; feedback; pharmacist; peer review.

Introduction

PRESCRIBING constitutes an increasingly large component of escalating National Health Service (NHS) costs.¹ Measures to try to control this have included the appointment of medical and pharmaceutical advisers, fundholding and commissioning group initiatives, the encouragement of rational prescribing and, more recently, cash-limited unified budgets for health authorities and primary care groups (PCGs) and trusts (PCTs).

While fundholders may have limited their prescribing expenditure more successfully than other practices, there is evidence that initial gains were not maintained^{2,3} except by dispensing practices.² General practitioners (GPs) in dispensing practices were thought to have responded more effectively to prescribing initiatives because they were better informed about prescribing costs.

In 1997, nine practices from Southern Derbyshire became a commissioning group pilot, a condition of which was to keep within a prescribing budget. Prescribing costs varied widely between the practices; collectively they had previously been over-budget and they undertook an initiative in 1998 to develop more cost-effective prescribing. The practices were all within one geographical locality.

Initiative

The initiative comprised input from a health authority pharmaceutical adviser, practice comparison feedback, peer review meetings, and prescribing recommendations. The pharmaceutical adviser worked for the group approximately one day a week for one year, obtaining electronic prescribing analyses and cost (ePACT) data for six therapeutic areas, in partnership with the HA medical advisor (a GP member of the intervention group). The six areas were: gastrointestinal, cardiovascular, respiratory, central nervous system, infections, and musculoskeletal and analgesics (*British National Formulary* [BNF] chapters 1–5 and 10).

Six fortnightly postgraduate educational allowance accredited meetings were held between February and May 1998, one for each therapeutic category. Prior to each meeting, all GPs were sent a copy of the practices' comparative prescribing costs, number of items, and percentage of generic items, within that BNF chapter. The emphasis was on developing rational prescribing:⁴ more use of therapeutically equivalent cheaper alternatives, increased generic prescribing, avoiding drugs of limited clinical value, and reduced over-prescribing. At the meetings the pharmaceutical adviser presented the data; differences were discussed and a consensus was aimed for regarding changes. It was intended that GPs would discuss the issues within their

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HOW THIS FITS IN*What do we know?*

Some interventions have successfully modified GPs' prescribing patterns — at least in the short term. Most of the literature relates to fundholding practices; little is known about initiatives involving groups of practices.

What does this paper add?

Practices with diverse prescribing patterns can work together effectively to control prescribing costs.



practices and modify their prescribing behaviour, if necessary.

Additional printed information, either specific to that meeting's topic or in response to previous queries, was sometimes given. This covered the recommended management of specific conditions, comparative costs of different drugs, and potential cost savings of percentage switches from certain proprietary drugs to generics. A summary of salient points, including general prescribing recommendations, from the previous meetings was discussed at the sixth meeting. Practice-specific recommendations from the pharmaceutical adviser were also distributed to each GP.

There was a meeting for feedback of half-yearly ePACT data in October 1998.

Method*Participants*

All nine practices (36 GPs) in a commissioning group pilot, later a PCG, in Southern Derbyshire participated. The comparison group consisted of nine practices (44 GPs) from the same health authority, who had had no specific prescribing initiative during the study period. The groups were similar as regards rural/semi-rural location, average number of patients per whole-time equivalent GP, number of elderly patients, and number of dispensing practices; however, the comparison group had eight former fundholding practices, compared with the study group's four.

Outcome measures

Outcome measures were: deviation from practices' prescribing budgets; changes in practices' ePACT data (net ingredient cost/patient unit [nic/PU]; number of items/PU; percentage of generic items) between the two years April 1997–March 1998 and April 1998–March 1999, for overall prescribing and BNF chapters 1–6, 10 and 'all others'; and changes in practice monthly prescribing trends over the two years.

Figures were also obtained for the health authority average to ascertain to what extent the practices were representative.

Two quality markers were used: BNF chapter 6, the endocrine system, with rising prescribing indicating good practice,⁴ and overall number of items/PU.

To see whether there was an overflow of effects to non-

target areas, data for 'all other' areas of prescribing were collated. Monthly ePACT data were collated to show trends, both for the two groups as a whole and for individual practices for overall nic/PU, items/PU, and percentage of generic items.

Analysis

Differences between the two groups' changes in prescribing data were analysed using the Mann–Whitney U-test, using SPSS 9 software.

Results*Prescribing budget*

During the four years preceding the initiative the study group was over-budget by an average of approximately £78 000 per year. Following the intervention, the group was more than £200 000 within budget during 1998/1999 (Figure 1).

Although the comparison group also came well within budget, the study group made greater savings (approximately £22 000 more). Until 1998/1999 the former had been more within budget, by an average £75 000 more per year, than the study group. Both groups dropped markedly into deficit in 1997/1998 and made marked savings during the year 1998/1999, because a pilot project with the local acute trust had resulted in lower indicative prescribing limits for GPs in 1997/1998 with subsequent uplifts in 1998/1999.

The comparison group's expenditure continued to rise during 1997/1998 and 1998/1999, whereas the study group's started to reduce in 1997/1998 and reduced still further in 1998/1999 (Figure 2).

Prescribing costs

The study group had a significantly lower ($P = 0.03$) increase in median practice nic/PU (£0.69) compared with the comparison group (£3.80) (Table 1). Although their baseline was higher, their 1998/1999 nic/PU was below that of the comparison group.

Both groups' average practice nic/PU were less than the health authority average for both years. In most BNF categories, including 'all others', the study group's nic/PU increased less than the comparison group's (Table 2), the exceptions being endocrine and musculoskeletal drugs. Statistically significant differences occurred for the change in gastrointestinal ($P = 0.005$) and infections nic/PU ($P = 0.003$), where the study group reduced their costs; and for the change in cardiovascular nic/PU ($P = 0.01$). In these three categories the study group's baseline costs were higher, but their 1998/1999 costs fell below those of the comparison group.

The study group's costs fell below, and thereafter remained below, those of the comparison group in March 1998, one month after the initiative began (Figure 3). There were marked differences between the study and comparison groups' monthly nic/PU in May 1998 and December 1998, which related to different phases of the initiative.

Prescribing volume

The study group had a higher median overall number of items/PU than the comparison group for both years

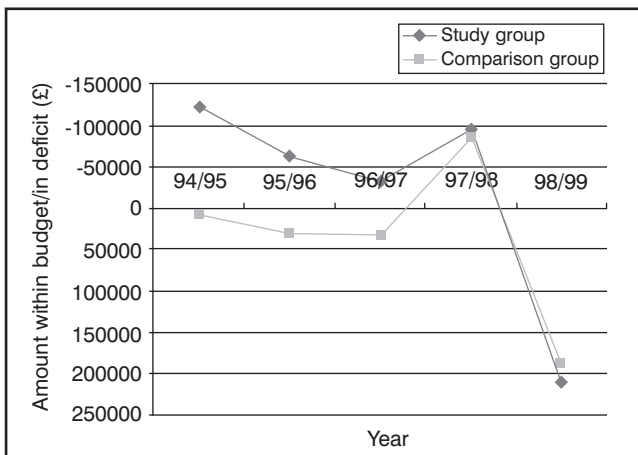


Figure 1. Deviation from prescribing limits for study and comparison groups: 1994/1995 to 1998/1999.

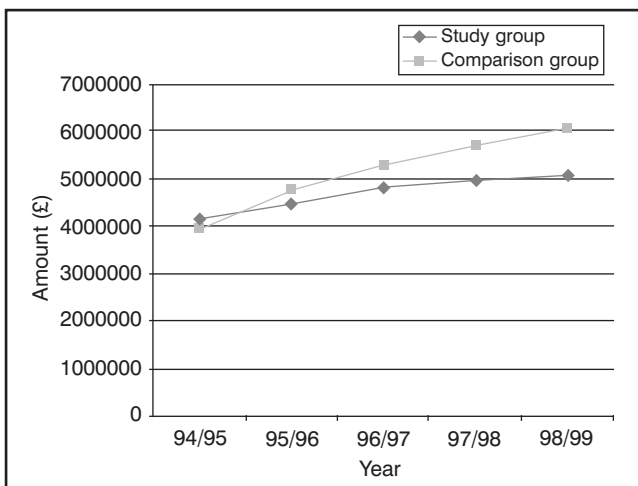


Figure 2. Prescribing expenditure of study and comparison groups: 1994/1995 to 1998/1999.

(Table 1). Their increase was less, but not significantly so. Their average overall number of items/PU close to the health authority average for both years. Both groups had a higher increase in number of items/PU than the health authority average.

The study group's median increases were less than the comparison group's for all *BNF* categories except musculoskeletal and endocrine; their median baseline figures were lower or equal for half of the categories (data for items/PU and percentage of generic items are available from the authors on request). Both groups reduced the number of items/PU prescribed for infections.

Generic prescribing

The study group had a larger, but non-significant increase in percentage of overall generic items than the comparison group (Table 1). However, their median figures for both years were lower than the comparison group's. Both groups had a greater increase in percentage of generic items and a higher average percentage of generic items for both years than the health authority average.

All practices in both groups increased their overall per-

Table 1. Changes in overall prescribing variables (median) for study practices between 1997/1998 and 1998/1999 compared with non-matched controls.

Prescribing measure	Study practices: median (interquartile range)		Comparison practices: median (interquartile range)		Mann-Whitney	
	April-March 1997/1998	April-March 1998/1999	April-March 1997/1998	April-March 1998/1999	U	Two-tailed P
nic/PU (£)	64.84 (62.12 to 67.35)	66.42 (61.74 to 68.76)	64.12 (55.24 to 66.42)	66.84 (59.79 to 71.20)	15.5	0.03
Number of items/PU	6.92 (6.75 to 7.84)	7.02 (6.88 to 8.02)	6.65 (6.43 to 7.81)	6.89 (6.67 to 8.09)	29.0	0.31
Percentage generic items	61.36 (53.01 to 68.90)	66.49 (59.02 to 71.48)	64.30 (62.25 to 69.68)	67.80 (63.78 to 72.60)	25.0	0.17

Table 2. Changes in median nic/PU for chapters 1-6, 10 and remainder of the *BNF* for study and comparison practices between 1997/1998 and 1998/1999.

BNF chapter	Study practices: median nic/PU (£) (interquartile range)		Comparison practices: median nic/PU (£) (interquartile range)		Mann-Whitney	
	April-March 1997/1998	April-March 1998/1999	April-March 1997/1998	April-March 1998/1999	U	Two-tailed P
1. Gastrointestinal system	9.9 (8.85 to 10.85)	9.0 (8.05 to 10.25)	9.6 (8.2 to 10.5)	9.5 (8.4 to 10.1)	9.0	0.005
2. Cardiovascular system	12.5 (10.6 to 14.5)	13.5 (11.9 to 15.4)	12.2 (11.15 to 14.95)	14.4 (12.8 to 16.9)	11.0	0.01
3. Respiratory system	7.1 (5.65 to 10.25)	7.7 (5.8 to 9.85)	7.7 (6.2 to 8.55)	7.7 (6.65 to 8.7)	29.5	0.33
4. Central nervous system	8.6 (7.2 to 9.85)	9.7 (7.8 to 11.1)	8.7 (6.8 to 10.3)	9.8 (8.5 to 12.15)	19.5	0.06
5. Infections	2.3 (1.85 to 2.55)	1.8 (1.5 to 2.05)	2.2 (1.65 to 2.5)	2.0 (1.8 to 2.4)	7.5	0.003
6. Endocrine system	5.0 (4.3 to 5.5)	5.3 (4.75 to 6.05)	4.4 (4.3 to 5.25)	5.1 (4.45 to 5.9)	38.0	0.82
10. Musculoskeletal and joint diseases	2.7 (2.2 to 3.05)	2.4 (1.95 to 2.85)	2.7 (2.15 to 3.35)	2.4 (2.0 to 3.2)	37.0	0.75
All others	14.1 (13.3 to 14.6)	14.6 (13.15 to 15.05)	13.4 (12.55 to 14.3)	13.7 (13.3 to 14.4)	36.0	0.69

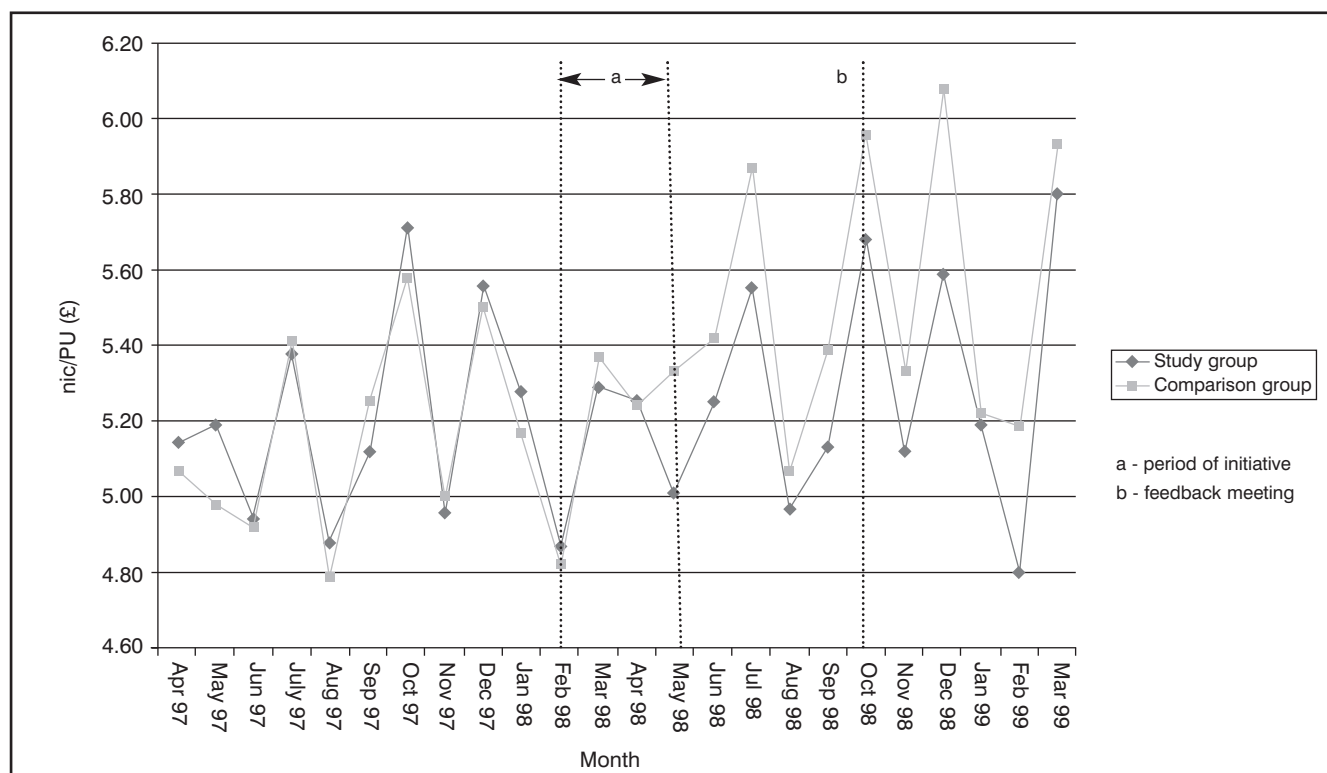


Figure 3. Average monthly nic/PU for study and comparison groups: April 1997–March 1999.

centage of generic items. Although there was a wide variation in percentage of generic items in both groups in April 1997, the study practices were more evenly spread than the comparison practices. Eight of the nine comparison practices had more than 60% of generic items at this time, compared with only four of the study practices. By March 1999, the study practices' variation had narrowed (from a range of 43–72% to 59–76%).

The study group had bigger median increases in all *BNF* categories. Their baseline figures were lower than the comparison group's for all but two categories (gastro-intestinal and respiratory). In 1998/1999, these two categories remained higher and two others became higher (cardio-vascular and endocrine); the other four categories started and remained at a lower level.

Discussion

The evaluation had limitations. The data collation used PUs, which allowed for comparison between practices with different list sizes and different numbers of older patients but are not considered to be a very sensitive measure. However, the more sensitive ASTROPUs, and STARPUs for therapeutic categories were not available from ePACT across the period studied at the time of data collection. In addition, the cost of prescribed drugs in isolation may give a false picture of the cost-effectiveness of treatment; there is a need to link it with indices of opportunity costs, such as morbidity, hospital admissions, and referrals.²³ However, this was beyond the scope of this evaluation.

The study group achieved its aim of keeping within its prescribing budget during the year of the initiative, for the first

time in five years. Although the uplift in budget would have contributed to this, a number of the differences between the intervention and comparison groups' changes in prescribing costs were statistically significant, supporting a causal relationship. The difference between the two groups appears to be owing to a slowdown in the study group's expenditure, rather than any particular increase by the comparison group, whose expenditure for 1998/1999 was in line with its previous trend. Although the comparison group's expenditure continued to rise, it also came well within budget because of the uplift in budgets for 1998/1999.

Although the study group's baseline costs were higher than those of the comparison group's overall, and for many therapeutic categories, following the initiative their costs were lower for all but two categories. Thus they went beyond merely catching up with the comparison group. This slowing of expenditure reflects findings elsewhere in studies of fund-holders⁶ and recent interventions by pharmacists.⁷ Significant reductions in expenditure occurred in treatment for infections and gastrointestinal drugs. The former would have been partly owing to the reduction in items prescribed. Although the latter would have been partly attributable to a reduction in the cost of omeprazole, and also ranitidine coming off patent at this time, this would have affected the comparison group as well. However, others have also reported significant reductions in costs for these *BNF* chapters following recent initiatives,⁷ which suggests that these are areas particularly amenable to modification. Much of the reduction in costs, or slowing of the rates of increase, is probably owing to switches to comparable, cheaper drugs and generic substitutions; despite the fact that in 1998/1999 some generics increased in price sevenfold and the number

of generics in short supply (category D drugs) increased from 30 to 190.⁸ This price rise highlighted the fact that GPs can only do so much to control prescribing costs; measures are needed at policy level to prevent such situations from freeing cash for future service developments.⁵ That costs in the study group rose less than those in the comparison group in most *BNF* categories suggests that savings were made in several ways rather than just from switching one or two drugs; however, the data presented in this study cannot show how this happened. The overflow of effects into areas of prescribing not specifically targeted by the initiative, 'all others', has been found elsewhere.⁹

Besides the confounding effects of price reductions for some drugs, both groups would have been subject to the influence of national and local guidelines encouraging increased generic prescribing, as well as national measures to reduce antibiotic prescribing.

The study group started from a lower baseline of percentage of generic items than the comparison group overall and in most therapeutic categories, which would account partly for their greater increases in generic prescribing levels. However, in half of the categories, their post-initiative percentages were higher than those of the comparison group's, so catching up does not account for the entirety of the increases.

The study group's costs fell below the comparison group's one month after the start of the initiative, suggesting that it had fairly immediate effects. This is contrary to previous findings of a time lag, giving GPs time to adjust their prescribing with such interventions.¹⁰ However, these findings were from the early 1990s, prior to practices having indicative budgets and becoming more accustomed to making specific prescribing changes, and so may be less relevant now. Several of the study practices had been involved with similar measures prior to the initiative; consequently, the changes were a continuation of previous practice for them.

The Audit Commission¹¹ drew attention to the wide variation between practices' prescribing figures, partly attributable to factors such as GPs' behaviour.¹² Following the initiative, the variation between the study practices' overall percentage of generic items fell; however, the variation in overall costs and items did not. The figures for one practice with extremely low costs and items reflected not only their lower index of need, but also their beliefs in the desirability of drugs generally. It may be that GPs in some of those practices with higher prescribing figures held very different opinions. If this is so, the slowing of overall expenditure for the group suggests that a group of practices can control their costs while still accommodating diverse individual practice. As the rationale behind prescribing is not purely pharmacological, some variation is probably inevitable.¹³ Consequently, prescribing recommendations and guidelines should inform practice, rather than dictate it.

Although concerns have been raised recently as to whether some general practices have made relative savings by being conservative in their uptake of important drugs, such as hormone replacement therapy,¹⁴ the study group's costs for endocrine drugs rose more than the comparison group's. Neither was there a significant change in the other quality marker — the overall number of items, suggesting

that overall costs were controlled by alterations rather than reductions in prescribing and so not at the expense of quality of patient care. Furthermore, although the initiative was cost driven, recommended prescribed charges were based on the principles of rational prescribing which take account of individual patient needs.

The initiative incorporated many features associated with the successful implementation of change generally in general practice. It was multi-faceted^{15,16} and included: expert input (the pharmaceutical advisor);¹⁷ feedback^{15,18} that was not unsolicited (an ineffective method¹⁹), given that the group had decided to undertake changes; peer review;²⁰ a consensus process;²¹ and specific recommendations for change.¹⁶ Its timing was opportune, coming as it did at a time of increased public awareness of issues regarding prescribing of antibiotics and the need to control NHS costs. The importance of timing in facilitating change has been recognised elsewhere.²²

That dispensing practices were the only ones to maintain initial gains in one of the few follow-up studies conducted² suggests that increased awareness of costs may help the study group maintain its gains. It also validates the role of pharmaceutical advisers in promoting good quality, cost-effective prescribing.⁷ The danger of reverting to previous prescribing patterns was acknowledged by study group GPs, who intended continuing to meet to counteract this.

In conclusion, we have shown that prescribing initiatives such as this can reduce costs for a group of practices — whether this can be maintained is an important area for future research.

References

1. Majeed A, Evans N, Head P. What can PACT tell us about prescribing in general practice? *BMJ* 1997; **315**: 1515-1519.
2. Stewart-Brown S, Surender R, Bradlow J, et al. The effects of fundholding in general practice on prescribing habits three years after introduction of the scheme. *BMJ* 1995; **311**: 1543-1547.
3. Whynes DK, Heron T, Avery AJ. Prescribing cost savings by GP fundholders: long-term or short-term? *Health Econ* 1997; **6**(2): 209-211.
4. Clark J. Rational prescribing in primary health care. In: Riley C, Warner M, Pullen A, Piggot CS (eds). *Releasing Resources to Achieve Health Gain*. Oxford: Radcliffe Medical Press, 1995; 31-36.
5. Walley T, Burrill P. Generic prescribing: time to regulate the market? [Editorial.] *BMJ* 2000; **320**(7228): 131-132.
6. Rafferty T, Wilson-Davis K, McGavock H. How has fundholding in Northern Ireland affected prescribing patterns? A longitudinal study. *BMJ* 1997; **315**(7101): 166-170.
7. Rodgers S, Avery AJ, Meechan D, et al. Controlled trial of pharmacist intervention in general practice: the effects on prescribing costs. *Br J Gen Pract* 1999; **49**: 717-720.
8. Jones J. Government orders inquiry as price of generic drugs soars. [News.] *BMJ* 1999; **319**: 1151.
9. Dowell JS, Snadden D, Dunbar JA. Changing to generic formula-ry: how one fundholding practice reduced prescribing costs. *BMJ* 1995; **310**: 505-508.
10. Haaijer-Ruskamp FM, Denig P. Impact of feedback and peer review on prescribing. In: Kochen MM (ed). *Drug education in general practice*. [Occasional Paper 69.] London: RCGP, 1995; 13-19.
11. Audit Commission. *A prescription for improvement: towards more rational prescribing in general practice*. London: HMSO, 1994.
12. Salisbury C, Bosanquet N, Wilkinson E, et al. The implementation of evidence-based medicine in general practice prescribing. *Br J Gen Pract* 1998; **48**: 1849-1851.
13. Del Mar C. Sore throats and antibiotics. Applying evidence on small effects is hard; variations are probably inevitable. [Editorial.] *BMJ* 2000; **320**(7228): 130-131.
14. Avery AJ, Rodgers S, Heron T, et al. A prescription for improve-

- ment? An observational study to identify how general practices vary in their growth in prescribing costs. *BMJ* 2000; **321**: 276-281.
15. Wensing M, van der Weijden T, Grol R. Implementing guidelines and innovations in general practice: which interventions are effective? *Br J Gen Pract* 1998; **48**: 991-997.
 16. NHS Centre for Reviews and Dissemination. Getting evidence into practice. *Effective Health Care* 1999; **5**(1), University of York
 17. Hill-Smith I. Sharing resources to create a district drug formulary: a county-wide controlled trial. *Br J Gen Pract* 1996; **46**: 271-275.
 18. Mugford M, Banfield P, O'Hanlon M. Effects of feedback on clinical practice: a review. *BMJ* 1991; **303**: 398-402.
 19. O'Connell DL, Henry D, Tomlins R. Randomised controlled trial of effect on general practitioner's prescribing in Australia. *BMJ* 1999; **318**: 507-511.
 20. Wensing M, Grol R. Single and combined strategies for implementing changes in primary care: a literature review. *Int J Qual Health Care*, 1994; **6**(2): 115-132.
 21. Bateman DN, Eccles M, Campbell M, *et al.* Setting standards of prescribing performance in primary care: use of a consensus group of general practitioners and application of standards to practices in the north of England. *Br J Gen Pract* 1996; **46**: 20-25.
 22. Armstrong D, Reyburn H, Jones R. A study of general practitioners' reasons for changing their prescribing behaviour. *BMJ* 1996; **312**: 949-952.
 23. Buckley G, Allen J. Can rational prescribing be summatively assessed? In: Kochen MM (ed). *Drug Education in General Practice*. [Occasional Paper 69.] London: RCGP, 1995; 22-29.
 24. Bloor K, Maynard A. *Primary care in the UK: evolution or revolution?* [Policy document.] London: Institute of Health Services Management, 1999.

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