The facilitator effect: results from a four-year follow-up of children with asthma

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SUMMARY

Background. *A long-term evaluation of the process and outcomes of primary and secondary care is required to establish whether audit facilitators can improve the care of childhood asthma.*

Aim. *To examine the long-term effect of an intervention by an audit facilitator on the management of children with asthma, and to investigate the implications for health service costs.*

Method. *A 4-year follow up was conducted of an intervention and control group totalling 2557 children aged 1–15 years from 12 general practices in the Tayside region. Primary care consultations, prescriptions, hospital contacts and health service costs 1 year before and 3 years after a facilitator visited practices were recorded. The facilitator encouraged the diagnosis and treatment of childhood asthma in the intervention group.*

Results. *Favourable changes in consultation patterns, prescriptions and reduced hospital admissions seen during the intervention year did not persist in subsequent years. Two and three years after the facilitator visit the process and outcome of care was similar in both groups. The reduction in health service costs seen in the intervention group was equivalent to the cost of employing a facilitator.*

Conclusion. *The effect of a facilitator lasts only for the period of intervention. Enthusiasts will say that improving patient care without increasing health service costs justifies the widespread deployment of facilitators. Others more interested in long-term outcomes may disagree.*

Keywords: childhood asthma; facilitator; follow up.

Introduction

A PRIMARY care facilitator 'makes easy, furthers and helps forward' the process of health care.[1,2] Facilitators act as a catalyst for change within a practice, and studies have shown favourable changes in the process of primary care management for heart disease and stroke risk factors,[3] diabetes[4] and cancer risk assessment.[5] Changes in clinical outcomes have been difficult to demonstrate.

Influencing secondary care health service outcomes by changing primary care management is an attractive theory. However, there are problems. First, it is unknown how long the intervention effect from a facilitator lasts. Secondly, few controlled trials have shown a link between the process of primary care and hospital care outcomes. Finally, the cost-effectiveness of investing in primary care facilitation is not established.

This follow up of children with asthma or associated symptoms[6] presented an opportunity to observe the long-term primary and secondary care and economic outcomes of audit facilitation. Results from the years before and after intervention by the facilitator showed intriguing changes in primary care diagnosis and treatment.[7] This paper describes the 'facilitator effect' in subsequent years using childhood asthma as a clinical marker.

Method

A group of 3373 children, aged 1–15 years inclusive, with diagnosed asthma or symptoms suggestive of asthma, were identified from 10 725 children registered with 12 Tayside general practices.[6] In a randomized controlled trial, the individuals in an intervention group (n = 1585) were identified to the practices, invited for clinical review and had guidelines for diagnosis and management of asthma inserted into their case records by an audit facilitator.[7] The facilitator did not see patients directly, but acted as a resource or catalyst for practice staff. The control group (n = 1563) received standard medical care but in the context of raised practice awareness of asthma. At the end of the two-year study, all markings and insertions were removed to allow 'blind' examination of the medical records. Practices were revisited three years after the initial visit and medical records were inspected again by a trained secretary.

A target of 2456 children's records was set, assuming a doctor–patient turnover rate of 10% per year. The records were inspected for the years before the facilitator intervention (year 1), during the intervention (year 2) and in the follow-up period (years 3–4). The following were noted: primary care consultations for asthma and other respiratory problems, exacerbations of asthma, and anti-asthma prescriptions – classified by British Thoracic Society (BTS) steps[8] (i.e. bronchodilators only, cromoglycate-like drugs, inhaled corticosteroids, etc.), hospital admissions, outpatient and accident and emergency attendances for asthma.

With April 1991 as a baseline, the NHS scale of fees and allowances, prescription costs from the *British National Formulary* and hospital costs from Tayside Health Board sources[7] were used to estimate the following costs:

Primary care	
Patient-initiated consultation	£9.61
GP or nurse review of asthma	£6.66
Hospital care	
Average hospital admission	£408.59
Hospital outpatient attendance	£27.00
Accident and emergency attendance	£29.00

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Prescription costs per child per year

Step 1 (bronchodilator only)	£7.60
Step 2 (bronchodilator and cromoglycate-like drugs)	£102.24
Step 3 (inhaled corticosteroids low dose, <400 μg daily)	£84.69
Step 4 (inhaled corticosteroids high dose, > 400 μg daily)	£161.78

Primary and hospital care measures in the intervention group were compared against the control group for years 2, 3 and 4 using odds ratio analysis on an 'intention to treat' basis. These results are presented on number of children, not number of events. Cost estimates based on number of events were compared in both groups for each of the four years. The project was approved by the Tayside Medical Ethics Committee.

Results

Subjects

From the original 3373 children's records, 2557 (75.8%) were inspected for all four years. This exceeded the recruitment target of 2456 and implied an annual doctor–patient turnover of less than 10%. The age–sex mix and symptoms at entry to the study were very similar for those children followed up in the intervention and control groups (Table 1). In year 1, before the facilitator visit, the hospital admission rate was greater in the intervention than in the control group, although other proxy markers of asthma severity, such as consultation rates and treatment regimes, were similar.

Process of primary care: consultations

Practice-initiated reviews of asthma rose substantially after the facilitator visit (year 2) for the intervention group, but fell to previsit levels in the follow-up years (3 and 4) (Table 2). There was a trend for fewer children in the intervention group, compared with the control group, to make asthma consultations over the study period, and this difference was significant in year 4 (see Table 3). The number of children consulting for other respiratory problems showed a decline in both groups as the children aged (Table 2), but there were no significant differences between groups in any year (Table 3).

Process of primary care: prescribing

The number of children receiving bronchodilator therapy alone (corresponding to BTS step 1) was similar in both groups for years 1, 3 and 4 (Table 2), but different in year 2 when more intervention group children received it (Table 3). Significantly more intervention children were prescribed cromoglycate-like drugs (BTS step 2) in year 2. The number of children receiving inhaled corticosteroid therapy (BTS steps 3 and 4) rose in each successive year for both groups (Table 2).

Significantly more children had an exacerbation of asthma in the intervention group in year 2. However, this difference was reversed in year 3 (Table 3). The use of short courses of oral steroids and emergency nebulizations was similar in both groups for the study duration.

Outcomes of care: hospital contacts

Hospital admissions for acute asthma fell progressively from year 2 for the intervention group. However, the rate rose in year 2 for the control group, before falling. Admission rates were similar in both groups for years 3 and 4. There were no differences in accident and emergency and outpatient attendances (Table 2).

Costs of care

In the year after the facilitator visit, primary care costs rose for the intervention group but then declined steadily (Table 4). This reflected an increase in workload and preventive therapy prescribing in year 2, then a decline in consultations with constant prescribing costs in subsequent years. The control group primary care costs were lower than those of the intervention group in year 2, but higher in subsequent years.

Intervention group hospital care costs showed a 33% reduction in year 2, while control group costs rose slightly. Year 3 costs showed a 45% reduction for both groups. Control group costs remained constant in year 4, while intervention group costs fell by 10%.

Between years 1 and 4 of the study, overall cost estimates suggest a decrease of approximately £25 000 for the intervention group. However, the cost of managing the control group fell by £13 000 in this period, resulting in a net saving of £12 000. Even removing the large discrepancy of hospital admission costs in the previsit year (around £10 500), management of the intervention group would cost around £1 less per child per annum.

For this study, the facilitator visited 12 practices and reviewed 10 500 case records. A facilitator employed by a family health services authority (FHSA) might review 50 000 case records annually (around 200 records per day). Assuming the same prevalence of children with possible asthma requiring clinical review (around one-third, or 3373 out of 10 725), the savings made would equal approximately £16 000. This would recoup a facilitator's salary at 1991 rates, but would equal the estimated health service cost savings.

Discussion

Facilitator effect

Intervention by the facilitator produced a short-term change in primary care asthma management leading to reduced hospital service use during that year. These effects were not seen in subsequent years. In the years after intervention, the management of asthma showed few differences between the intervention and control groups. Those changes that were statistically significant (with confidence intervals excluding 1.0) could have arisen by chance. With over 20 odds ratio calculations, one spuriously significant result would be expected.

Hospital services use declined in both groups in the years following intervention. Previous studies have reported steadily increasing hospital admission rates for asthma throughout the 1980s, a peak in the early 1990s and a gradual levelling out.[14-16] The sustained reduction in both groups in this study may be caused by a general trend in improved asthma care across Tayside, or could simply be the effect of declining hospital admission rates with age in children.

Table 1. Comparison of intervention and control groups at start of study.

	Intervention group	Control group
Number	1288	1269
Boys	714 (55.4%)	756 (59.6%)
Girls	574 (44.6%)	513 (40.4%)
Average age	7.67	7.80
In year before study		
Bronchospasm	6.7%	5.9%
Cough	44.1%	44.0%
Asthma treatment	27.7%	29.8%
Exercise symptoms	4.0%	4.8%
Wheezy	19.1%	22.7%

Table 2. Primary and secondary care management over four years.

		Year			
		1	2	3	4
Primary care consultations (number of children)					
Patient-initiated for asthma	I	182	198	236	213
	C	203	163	252	250
Patient-initiated for other respiratory problems	I	706	564	325	269
	C	711	537	291	225
Practice reviews of asthma	I	184	355	170	166
	C	187	158	174	171
Maintenance prescribing (number of children)					
Bronchodilators only	I	391	398	314	282
	C	395	317	313	307
Cromoglycate-like drugs	I	80	95	52	32
	C	82	64	42	27
Inhaled corticosteroids	I	79	125	169	172
	C	78	133	164	199
Acute prescribing (number of children)					
Exacerbations of asthma	I	336	286	102	107
	C	352	227	132	114
Courses of oral corticosteroids	I	7	22	35	30
	C	4	16	28	31
Episodes of emergency nebulizations	I	38	42	29	18
	C	31	40	32	32
Hospital contacts for asthma (number of children)					
Admissions	I	33	24	11	9
	C	18	25	12	14
Accident and emergency	I	9	4	6	5
	C	8	4	8	6
Outpatients	I	67	62	37	40
	C	64	56	33	36

Intervention (I) (n = 1288); Control (C) (n = 1269).

Table 3. Comparison of intervention against control over four years.

	Odds ratio (95% CI) Intervention against controls		
	Year 2	Year 3	Year 4
Primary care consultations (number of children)			
Patient-initiated for asthma	1.23 (0.98–1.55)	0.91 (0.74 –1.11)	0.81 (0.66–0.99)
Patient-initiated for other respiratory problems	1.06 (0.91–1.25)	1.13 (0.94–1.37)	1.22 (1.00–1.50)
Practice reviews of asthma	**2.68 (2.16–3.31)**	0.96 (0.76 –1.21)	0.95 (0.75–1.20)
Maintenance prescribing (number of children)			
Bronchodilators only	**1.34 (1.12–1.60)**	0.98 (0.82–1.18)	0.88 (0.73–1.06)
Cromoglycate-like drugs	**1.50 (1.07–2.11)**	1.22 (0.79– 1.88)	1.17 (0.68–2.03)
Inhaled corticosteroids	0.92 (0.70–1.20)	1.02 (0.80–1.29)	0.83 (0.66 –1.04)
Acute prescribing (number of children)			
Exacerbations of asthma	**1.31 (1.07 –1.60)**	**0.74 (0.56 –0.98)**	0.92 (0.69–1.22)
Courses of oral corticosteroids	1.37 (0.69–2.74)	1.24 (0.73–2.11)	0.95 (0.56–1.63)
Episodes of emergency nebulizations	1.04 (0.65–1.64)	0.89 (0.52–1.52)	0.55 (0.29–1.01)
Hospital contacts for asthma (number of children)			
Admissions	0.94 (0.52–1.72)	0.90 (0.37–2.19)	0.63 (0.25–1.56)
Accident and emergency	0.99 (0.21–4.67)	0.74 (0.23–2.34)	0.82 (0.22–3.03)
Outpatients	1.10 (0.74–1.61)	1.11 (0.67–1.83)	1.10 (0.68–1.78)

Bold type indicates the confidence intervals for the odds ratio excludes 1.0. Intervention (n = 1288); Control (n = 1269).

Table 4. Estimated costs of asthma care (based on 1991).

	Year			
	1 Previsit	2 Post-visit	3 Follow up	4 Follow up
Intervention group				
Consultations	22 980	19 750	11 800	10 170
Maintenance therapy	19 830	25 570	24 250	24 680
Total primary care cost	42 810	45 320	36 050	34 850
Outpatient consultations	4 940	4 430	3 350	2 780
A & E attendances	320	290	170	200
Hospital admissions	20 430	12 260	6 130	5 720
Total secondary care cost	25 690	16 980	9 650	8 700
Overall costs	£68 500	£62 300	£45 700	£43 550
Control group				
Consultations	22 570	15 180	12 050	10 840
Maintenance therapy	20 200	23 230	24 740	25 660
Total primary care cost	42 770	38 410	36 790	36 500
Outpatient consultations	4 940	3 890	2 860	2 510
A & E attendances	260	170	320	230
Hospital admissions	9 810	11 440	5 310	5 720
Total secondary care cost	15 010	15 500	8 490	8 460
Overall costs	£57 780	£53 910	£45 280	£44 960

Duration of effect

The favourable short-term changes in primary care consultations and hospital admissions are probably due to the enthusiasm of doctors and practice nurses who reviewed and improved the care of children with asthma. Explanations as to why the changes did not persist may include the fact that enthusiasm waned or other clinical priorities diverted attention from the care of childhood asthma. Other studies seeking to improve asthma care in the long term have shown similar disappointing results.[17,18] It may be that all practices contain a subgroup of patients who are susceptible to initiatives to improve management. Once changes have been made, the improvements 'plateau' and no further improvement in morbidity can be shown.

The study design required the removal of all insertions and markings from the case notes of the intervention group children at the end of year 2. In a non-research situation, this would not occur and the management guidelines would remain in the notes. This could increase the long-term cost-effectiveness of a facilitator. A periodical facilitator visit to each practice would allow guidelines to be updated and give continuing educational feedback to practices.

Critics of controlled trials involving randomization of patients within practices rightly point out that control contamination will dilute any apparent changes over time. Undoubtedly, control contamination will have occurred within our study. The facilitator visit may have been a catalyst improving the care and management of all asthma patients within the practices, explaining why outcome measures for the groups converge in years 3 and 4. This dilution effect should be gradual with the differences greatest in year 2 and least in year 4, but our results do not follow this pattern.

Difficulties within the study

There are many methodological problems of conducting a four-year follow up of a large randomized control trial. Loss to follow up is the major one, but this study showed lower losses than expected. Tayside may not be typical of the rest of the UK. The 12 practices selected to be representative of the region in 1990 have changed personnel, attitudes and enthusiasm for asthma care over the course of four years.

Health service costs are notoriously difficult to interpret. Reduced hospital costs can only be realized by cutting expenditure through closing wards and reducing staffing levels. The interesting paradox arises that, if practices improve their management of a clinical problem, e.g. asthma, local hospital services may be cut, which in turn may jeopardize practice access to them.

The facilitator movement

Facilitators are now an established feature of the health service. The measures of process, outcome and costs presented in this study may be applicable to other fields, including cardiovascular disease risk factor prevention, diabetes, epilepsy and arthritis care. Purchasers and providers need to examine closely what is expected of facilitators. Using the childhood asthma model, it seems reasonable to expect facilitators working with enthusiastic general practice staff to alter clinical care favourably in the short term. It is unreasonable to expect facilitators to solve the long-term problem of childhood asthma and the burden it imposes on children, their families and the health service.

Conclusion

Readers can choose how to interpret this study. Enthusiasts can claim that a facilitator improves the process and outcome of the care of children with asthma for a year after intervention, and that the cost of a facilitator is offset by modest health service cost savings. A facilitator may raise practice awareness, leading to improved management for all patients. A periodic visit could be a cost-effective means of continuous educational feedback keeping practices up to date with current best practice. Others can claim that the absence of long-term changes in clinical outcomes means that widespread deployment of facilitators within the health service is not currently justified.

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