

# Organized personal care — an effective choice for managing diabetes in general practice

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**SUMMARY.** A system of diabetic review was introduced in two Southampton training practices in March 1985. Each partner, with the help of the practice nurse, retained responsibility for review of their own diabetic patients. During the study period (1984–86) 213 diabetics remained with the practices. In 1984 there were 94 non-insulin dependent patients who were not receiving hospital outpatient care. Over the study period there was an increase in the surveillance of blood glucose, blood pressure, weight, urine (for protein), fundi, visual acuity and feet for this group so that in 1986 between 79% and 89% of patients were having these parameters checked at least annually. More complications were found and more referrals for specialist evaluation were made. There was a trend towards transfer of care from the hospital to the general practitioner, and the proportion of non-insulin dependent diabetic patients receiving their care entirely from general practice increased from 22% to 60% over the period. There was a small increase in the workload of the general practitioners and a considerable contribution to care was made by the practice nurses.

It is concluded that structured personal diabetic care based on a nurse coordinated service is a satisfactory alternative to the 'specialist' general practitioner mini-clinic model.

## Introduction

RECENT publications reviewing the management in general practice of chronic disorders such as epilepsy,<sup>1</sup> hypertension<sup>2</sup> and diabetes<sup>3,4</sup> suggest that clinical care of patients could be improved by better organization. For example, practices auditing their diabetic population have demonstrated deficiencies in clinical examination and follow up, especially where no system of regular review exists.<sup>5-7</sup> Yet with good organization, adequate record keeping and an enthusiastic practice team, effective general practice based diabetic surveillance has been reported.<sup>8,9</sup>

A popular way of organizing this care is through a diabetes mini-clinic — a smaller version of the hospital system in which one general practitioner takes responsibility for diabetes surveillance within the practice, assisted by a practice nurse.<sup>8</sup> Yet, even in Wolverhampton, where the mini-clinic system was successfully pioneered at a district level, up to two thirds of practices do not take part.<sup>10,11</sup> One reason for this may be the

fragmentation of care which occurs when one partner takes on diabetic care for a practice. Mini-clinics may result in an unacceptable loss of the personal and continuing relationship between general practitioner and patient, and this applies particularly to the care of disorders such as diabetes which affect and are affected by all other health and social problems.

As personal care might not prove effective or might cause unacceptable increases in workload, it was decided to evaluate the introduction of organized personal diabetic care based on a nurse coordinated service in two urban practices in west Southampton in 1985. The two practices are involved in undergraduate teaching and postgraduate (vocational) training. The first practice is based in two converted premises and has a list size of 13 000. The second operates from the health centre attached to the university department of general practice and has a list size of 8200. Both practices employ practice nurses and reception staff who became involved in the delivery of diabetic care.

## Diabetic review system

Practice meetings were held independently in both practices to agree the aims of the service and personal responsibilities. All the doctors wished to review their own diabetic patients annually, and the nurses wished to extend their role beyond weighing patients and testing urine. The intention was to offer a comprehensive annual review to every patient to assess glycaemic control and to detect and refer early complications of the disease for specialist assessment. By involving the patients in their own management it was hoped not only to identify but also to assist in reducing existing risk factors such as hypertension and smoking.

Patients with diabetes are identified from memory, from repeat prescriptions and prospectively,<sup>4</sup> and their names entered in a disease register. Those invited to attend the review clinic are sent an appointment with an explanatory letter, outlining the aims of the review. All patients are asked to attend the week before review for a fasting blood glucose estimation carried out by the nurse. Patients receive a comprehensive annual review, and protected time is arranged for this once a month on a regular morning or afternoon. Annual reviews are coordinated by the nurse and attended by the doctor whose patients are under review that month. The general practitioner simply sets aside a 10-minute appointment for each diabetic patient, and in between can continue to run his or her usual surgery.

The practice attached nurse is responsible with reception staff for the organization of the service, sending appointments, maintaining the register and recalling the non-attenders. The nurse sees the patient first for 15–20 minutes. Together with checking weight, recording visual acuity, dilating the pupils, measuring blood pressure, and testing urine for the presence of protein she also discusses with the patient the reasons for these checks and any simple problems arising from them. In particular she offers preventive advice in relation to diet and foot care and can supply health education material as she thinks appropriate.

The doctor then comes in to the nurse's room to complete the consultation. In conjunction with the information provided in the nurse consultation, he or she then examines the retina, peripheral pulses and feet and makes an overall assessment. Changes in management are discussed with the patient and plans

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© Journal of the Royal College of General Practitioners, 1989, 39, 444-447.

for a follow-up made with the nurse, general practitioner or specialists as appropriate.

### Audit

The audit aimed to investigate the impact of this system of annual review on diabetic care in general practice particularly in relation to non-insulin dependent diabetes. Information gathered from the diabetic register and from records during the study period 1984-86 was used to determine whether diabetic review was transferred to general practice, whether surveillance of the diabetic population was improved in general practice, and what the impact was on patient care and practice workload.

### Method

The place of review was defined as the place where a minimum of one consultation per year was carried out in which there was recorded evidence of weight and blood glucose estimations, surveillance for tissue damage (for example, fundi, feet, proteinuria) and a management plan for future diabetes care made.

The level of surveillance was determined from records in the notes of the procedures performed at review sessions. The fasting blood glucose level was measured using standard laboratory methods, and used with estimates of weight as the method of monitoring metabolic control. The patients' weight was measured using Salter scales, the level of protein in the urine using Uristix, visual acuity (with usual glasses) using a standard Snellen chart and blood pressure by mercury sphygmomanometer. Fundoscopy was carried out after pupillary dilation using 0.5% tropicamide. Foot inspection included review of footwear, nails, skin condition and pulses.

The consultation rate, defined as all face-to-face contacts with the doctor or nurse from 1 January to 31 December, was determined for 1984 and 1986. New complications identified were taken to be entries in the notes with no previous record of the problem and referrals for specialist care were audited as a measure of the secondary health care need detected.

The change in place of review was studied among the diabetic patients already registered as diabetic with the practices by mid-1984 and who had not died or left the practice by 1986 (the stable population). Changes in fasting blood glucose levels and weight, identification of complications, referral of patients and changes in consultation rate were studied among the population of non-insulin dependent patients reviewed in general practice in 1986. Changes in surveillance were studied among the non-insulin dependent patients not attending hospital outpatient departments in 1984, that is those not receiving structured care before the study began. The reasons patients gave for not attending for review were also investigated.

The data for both practices have been combined except for nurse consultation rates which were only studied in the smaller practice and referral rates for complications which were only recorded in the larger practice.

The data were analysed by comparison of proportions using the standard normal deviate.

### Results

By 1986 the prevalence of diabetes in the two practices was 1.1%. Two hundred and thirteen patients with diabetes were identified in 1984 and were still living in the practice in 1986. Of these patients 153 (72%) were non-insulin dependent diabetics and 60 (28%) were treated with insulin in 1984.

#### Pattern of review

Table 1 demonstrates that, considering insulin-treated and non-insulin dependent diabetes together, significantly more patients

received annual review in 1986 than in 1984 (90% versus 69%; 21% difference; 95% confidence limits 14-28%). This improvement is due largely to an increase in general practitioner care of non-insulin dependent patients, 39% of whom received no regular review in 1984. By 1986, 74% of the non-insulin dependent group were reviewed in general practice, either alone (60%) or jointly in hospital clinics and general practice (14%), compared with 27% in 1984 (47% difference; 95% confidence limits 36-59%). The proportion of non-insulin dependent patients receiving review solely in hospital more than halved during this time, and overall, the proportion receiving hospital review decreased by 11% from 39% to 28%. While the hospital contribution to the review of insulin-treated patients remained largely unchanged, the small proportion of patients reviewed only by their general practitioner doubled, and the proportion of patients without regular review halved.

#### Diabetic surveillance

The number of specific procedures carried out was audited for the 94 non-insulin dependent diabetics not under hospital outpatient care in 1984. Among this group there was a significant increase in the level of surveillance for all the procedures listed in Table 2.

#### Changes in fasting blood glucose levels and weight

Among the 112 non-insulin dependent diabetics reviewed in general practice in 1986 there was a small and statistically insignificant reduction in mean blood glucose levels compared with values in 1985 (8.7 and 9.2 mM respectively). Similarly there was a small reduction in mean weight from 80 kg to 78 kg. This mean change obscures the fact that 28 patients lost more than 3 kg

**Table 1.** Place of regular review for the stable diabetic population of 213 patients in 1984 and 1986.

Place of review	Number (%) of non-insulin dependent diabetics		Number (%) of insulin-treated diabetics	
	1984 (n = 153)	1986 (n = 151) <sup>a</sup>	1984 (n = 60)	1986 (n = 62) <sup>a</sup>
Hospital	52 (34)	21 (14)	43 (72)	40 (65)
Hospital and general practice	7 (5)	21 (14)	5 (8)	7 (11)
General practice	34 (22)	91 (60)	6 (10)	12 (19)
No organized review	60 (39)	18 (12)	6 (10)	3 (5)

n = total number of patients in group. <sup>a</sup>Two non-insulin dependent patients transferred to the insulin-treated group between 1984 and 1986.

**Table 2.** Changes in surveillance among the 94 non-insulin dependent patients not receiving hospital outpatient care in 1984.

Procedure	% of patients for whom procedure carried out (95% confidence limits)	
	1984	1986
Blood pressure	50 (40-60)	89 (83-95)
Weight	56 (46-66)	89 (83-95)
Urinalysis (protein)	16 (9-23)	79 (71-87)
Fasting blood glucose level	61 (51-71)	88 (81-95)
Visual acuity	18 (10-26)	86 (82-90)
Fundoscopy	27 (22-32)	80 (72-88)
Foot inspection	27 (22-32)	81 (73-89)

than 3 kg in the year and 15 of these lost more than 6 kg; one patient achieving a 20 kg weight loss. In contrast, weight gains tended to be more common but smaller, only nine patients gaining more than 3 kg in weight over the year.

### Complications and referral rates

Table 3 lists the number of complications detected from 1984 to 1986 among the 112 non-insulin dependent patients reviewed in general practice in 1986. There is a marked increase in the number of new complications noted in both 1985 and 1986 compared with 1984 although the number fell in 1986. The larger practice documented the referral rates for specialist assessment among 67 non-insulin dependent patients. In 1984 there was just one documented referral, to the ophthalmology department, but in 1985 there were nine referrals (seven ophthalmology, one diabetic clinic and one chiropody) and in 1986 15 (seven ophthalmology, three diabetic clinic, four chiropody and one vascular clinic).

**Table 3.** New complications detected among 112 non-insulin dependent diabetics reviewed in general practice in 1986.

	Number of complications		
	1984	1985	1986
Retinopathy	4	10	5
Cataracts	0	5	4
Nephropathy	0	9	8
Ischaemic foot	1	1	2
Total	5	25	19

### Consultation rates

The mean consultation rate per annum with the doctor for the 112 non-insulin dependent patients in both practices was 8.2 (standard deviation 7.0) in 1984; this increased to 9.1 (SD 8.0) in 1986. The smaller practice looked at nurse contacts with all patients for diabetic review and follow up and found a contact rate of 2.3 per patient per annum in 1985 and 2.5 in 1986. In 1986, the practice nurse followed up 42 patients (50% of the diabetic population) at 146 follow-up appointments. The majority of appointments (118) were for dietary advice; the remaining 28 were for supervision of treatment change and blood glucose monitoring.

### Non-attenders

While 66 patients did not receive regular review in 1984, there were still 21 patients who had no regular review in 1986, the majority (18) belonging to the non-insulin dependent group. Their age range was 21–92 years. For 10 patients the practice knew of no specific reason for their failure to attend. Only four patients were recorded as refusing to come while three were known to be housebound and two in hospital. Two patients said they preferred review in routine surgeries.

### Discussion

This study demonstrates that structured personal diabetic care, based on nurse coordinated review in general practice, can improve population surveillance and identification of treatable pathology without deterioration in blood glucose control or weight. It thus provides evidence to support previous descriptive reports which have advocated flexibility in the organization of diabetes care.<sup>12</sup>

The pattern of diabetic care in these two practices in 1984 was similar to that reported in other practices without organized ser-

vices,<sup>4,13</sup> with about half the patients attending hospital outpatient departments and 30% receiving no regular review anywhere. Introduction of organized personal care resulted in a significant improvement in the number of patients under regular review such that only 10% received no such review in 1986. Increase in general practice care was responsible for this improvement and there was a concomitant shift in place of review, mainly among non-insulin dependent patients, from hospital towards general practice. By 1986 only 29% of patients received hospital review alone, but shared care had increased. This reflects the explicit policy of the practices not to take over patient care until there was confidence in the primary care service. Despite this, the majority of diabetic surveillance was undertaken in primary care by 1986. These figures are still an underestimate of the primary care contribution as they omit those patients diagnosed since 1984, most of whom have been managed in general practice from the outset.

The percentage of patients failing to attend for review without explanation (5%) is similar to that reported from the Wolverhampton mini-clinics and is considerably lower than that for hospital clinics.<sup>14</sup> The improvement in regular review was paralleled by a significant increase in recorded surveillance of eyes, feet, blood pressure, weight, and blood glucose levels among patients not receiving regular outpatient care in 1984. The value of this recording exercise is demonstrated by the increased documentation of tissue damage, and the rise in referral rate to specialist diabetes support services over the three years. However, while the number of new complications identified fell in 1986, the number of referrals for specialist help continued to rise. This lag effect probably results from the reassessment and establishment of progression of a problem that occurs in general practice before the decision to refer is made.

Despite the increasing contribution of the primary care team to care there was no evidence of deterioration of blood glucose levels or weight among the non-insulin dependent patients. Such a deterioration has been documented among patients under general practice care in other schemes<sup>7,15</sup> and appears to be due to the inability of disorganized care to stop the natural progression of the disorder.<sup>16</sup>

The non-insulin dependent diabetics in this study were heavy consulters, with a mean consultation rate of more than twice that reported nationally.<sup>17</sup> The mean age of the non-insulin dependent diabetic patients in the smaller practice was 62 years, and the mean consultation rate for the age group 65–69 years in that practice over the same time period was 3.0 per patient per annum.<sup>18</sup> Further study is required to assess the reasons for the high workload generated by these patients; but it was not significantly altered by the introduction of diabetic surveillance. Extra follow up was largely carried out by the practice nurses, and the advice they offered was associated with considerable weight loss among 28 out of 112 non-insulin dependent patients.

This combined practice audit provides evidence that the majority of patients with diabetes are now attending general practice for annual review and receiving at least as good a standard of care as before. This provides us with the motivation to continue despite our increased awareness of patients who find it hard to attend or to achieve their desired weight loss or blood glucose control.

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#### Acknowledgements

We gratefully acknowledge the financial support of the Nuffield Provincial Hospitals Trust and Nordisk (UK), and the contribution of Mrs S. Reading at the planning stage.

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