Audit and TQM in diabetic care in general practice

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Total quality management (TQM) emphasises the need to look at each stage in a process to find deficiencies which can be improved; to introduce systems to ensure that the final outcome is satisfactory; to work as a team; and to involve each member of the team in the process and its improvement.¹

It seems timely to present one practice's approach to audit which has developed steadily towards the use of these principles. As the principles of TQM were used, so outcome improved, the workload spread, and morale increased. Audit of diabetes will be used as an example, and how the practice has extended the same principles to quality improvement for other topics will be described.

Beginnings: 1988-9

The practice had kept its disease register and recall information on computer (VAMP) since 1984, while clinical care was carried out with a flow card in the manual record. Audit, or rather data collection, began in 1988 solely with the review of process. We ensured that our diabetes disease register was complete by checking patients' names against those receiving prescriptions for insulin or oral hypoglycaemic agents; we examined the number of diabetic patients registered on the computer for follow up; and noted the number who were up to date with their appointments. Performance was found to be less good than might have been expected (table 1). The data were discussed by the partners, but as so often happens the essential parts of the audit cycle (figure) were omitted; we did not specify a care plan nor did we set targets.

Intermediate outcomes: 1989-90

The data were re-examined the following year, but although recall rates had risen a little, only just over a third of patients registered for follow up were up to date with their follow up (table 1). At this stage the practice agreed that a subgroup comprising a doctor, practice nurse, manager, and receptionist would develop a care plan, and certain changes were made affecting different members of the primary health care team (box 1).

In particular it was decided that we should move from looking at process to looking at intermediate outcome by examining clinical

Audit cycle

data, and a checklist was drawn up (box 2). It can be seen that for several items the process criteria that we had previously examined were supplemented by criteria of intermediate outcome (indented items). Drawing up a criterion list in this way shows clearly that practices can start slowly, firstly looking at process and then progressing to outcome.

In 1990 we reviewed clinical data for patients taking oral hypoglycaemic agents (table 2). We were particularly disturbed by the poor control of blood pressure and fasting blood glucose concentration and that fundi were being examined in only half of patients. We resolved to concentrate on these clinical measures.

Team development: 1990-1

During the 1990 review the receptionist had extracted the required data for the doctor to analyse: it had subsequently sat on his desk for over six months. When the analysis was finally produced the receptionist declared that she could have done it, and she was given future responsibility for maintaining the diabetes register; organising appointments; annually reviewing records to extract audit data; analysing the data; and presenting the analysis, firstly to the diabetes subgroup and then to a practice education meeting. The result has been prompt efficient audit; an examination of

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Table 1 Performance of follow up in diabetic patients

Year	No registered for follow up	No recalled (%)	No up to date with appointments	
			(% of recalled)	(% of registered)
1988	73	43(59)	18(42)	18(25)
1989	83	62(75)	31(50)	31(37)
1991	76	66(87)	58(88)	58(76)

- A large part of the follow up deficit is in housebound patients
Plan: involve the district nurse
- Defaulting occurs owing to difficulty with forward appointments
Plan: one receptionist to have responsibility for these and to send out reminder cards
- We need clinical data
Plan: one receptionist (as above) to review records according to an agreed list of criteria

Box 1 1989 Audit: plans for care

Seen for diabetes in past year?
Fasting blood glucose concentration measured in past year?
<10 mmol/l?
<8 mmol/l?
HbA _{1c} or fructosamine concentration measured in past year?
HbA _{1c} <10% or fructosamine <300 mmol/l?
Weight measured in past year?
Body mass index <30 kg/m ² ?
Body mass index <25 kg/m ² ?
Smoking record in notes?
Smoker?
Cholesterol concentration measured in past five years?
<8 mmol/l?
<6.5 mmol/l?
Visual acuity measured in past year?
>6/12 for both eyes?
Fundi examined in past year?
Both normal?
Urine checked in past year?
Protein present?
Blood creatinine concentration measured in past five years?
<150 µmol/l?
Feet examined in past year?
Sensation normal?
Pulses present?

Box 2 Checklist of process and intermediate outcome measures

Table 2 Follow up of diabetic patients taking oral hypoglycaemic agents. Figures are numbers

Clinical measure	1990	1991
Total	39	37
On recall	31	33
Overdue	7	5
No record of blood pressure in past year	10	5
Last recorded diastolic blood pressure >100 mm Hg	6	2
No record of blood glucose concentration in past year	6	5
Last recorded blood glucose concentration >10 mmol/l	14	17
No record of examination of fundi in past year	20	9
No record of smoking in notes	6	4
No record of cholesterol concentration	17	9
Recording of foot pulses	3	7

- Nine of 37 patients still overdue for follow up
Plan: receptionist to refer to doctor if patient found overdue at audit
- Poor control of blood glucose concentration (50% >10 mmol/l)
Plan: doctors to review carefully at clinic
- Feet rarely examined
Plan: include examination in nurses' instead of doctors' responsibility

Box 3 1991 Audit: plans for care

Topic	Key worker	Resource doctor	Review date
Child care	Health visitor	Dr A	May
Hypertension	Nurse X	Dr B	October
Diabetes	Receptionist G	Dr B	January
Access	Receptionist H	Dr B	March and September
Health checks	Nurse Y	Dr C	October
Well women	Nurse X	Dr D	April
75+	Nurse Z	Dr C	April
Pharmacy	Receptionist J	Dr A	April
Practice report	Practice manager	Dr C	March

Box 4 Practice teamwork

failures in the system from appointment making, through the nurse clinic, to the doctors' decision making; and an appreciable improvement in morale. In 1991 the audit still disclosed evidence of deficiencies in care, although improvement over the previous year was appreciable (table 2). Nine patients remained overdue for follow up; almost all were housebound or in residential homes for the elderly. Poor control of blood glucose concentration reflected the number of overweight elderly patients taking maximum oral treatment.

After presentation and discussion of the data further plans were agreed for 1991–2 (box 3). Audit and management of care now involved all disciplines in the practice team and all stages of diabetic care. Tables 1 and 2 show that follow up and clinical control (process and outcome) have now both appreciably improved with the TQM approach.

Teamwork in other audits

Stimulated by the improvement in diabetes care, the practice began to apply the same principles to other care topics. Several topics of care are now handled by subgroups who review their management. Each subteam comprises a representative of each discipline involved (for instance, the child care team consists of a receptionist, health visitor, practice nurse, doctor, and practice manager) and can examine each stage in the delivery of care. The annual audit is the responsibility of one staff member, using a doctor as resource (box 4). Practice education meetings are used to report back to the whole primary health care team, which can discuss and agree care plans and targets for the next year.

This system leads naturally to a team written practice report. Each section of the report is written by its subgroup so a wide range of care topics is covered, and in each case all team members from receptionist to senior partner have input. In this way each stage of the process of care for each topic is considered – but currently without the patients' viewpoint, clearly an omission which must be remedied. The practice report is written according to principles of audit so that it records the year's activity, describes the care plan for the next year, and explicitly states targets.

Conclusion

Medical audit is often stated to be an arid topic which tends to examine practice retrospectively in a destructive way: in this regard it is contrasted with quality improvement.¹ We have shown that by completing the audit cycle by planning care and setting targets and by developing team work and TQM we have used audit to stimulate demonstrable improvement in the process and outcome of care.

The practice thanks Mrs Sue Trinder for carrying out the audits since 1990.

1 Berwick DM. Continuous improvement as an ideal in health care. *New Engl J Med* 1989;320:53–6.