Cost-effectiveness of a multidisciplinary diabetes care clinic
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
A multidisciplinary diabetes care clinic (DCC), to improve glycaemic control and to reduce the risk factors among patients with poor control of their diabetes, was examined. The team consisted of endocrinologists, clinical pharmacists, clinical dieticians and certified diabetes nurse educators. The DCC was based at the Scott and White Health Plan (SWHP) clinic. The clinic provided diabetes management and risk reduction through patient education, screening and the treatment of diabetes complications, for those patients in the SWHP who were the least successful at controlling their diabetes.

Type of intervention
Patient care management.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients enrolled in the SWHP with a diagnosis of type 1 or type 2 diabetes, who were enrolled in the multidisciplinary DCC for at least one year.

Setting
The setting was not explicitly stated, but it appears to have been that of a primary care medical centre. The economic study was conducted in the USA.

Dates to which data relate
The effectiveness and resource use data were gathered from 1997 to 2000. The price year was 2000.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

Link between effectiveness and cost data
The costing was performed retrospectively on the same sample of patients as that used in the effectiveness study.

Study sample
Power calculations do not appear to have been conducted. Patients at the DCC with a glycosylated haemoglobin (HbA1c) concentration of greater than 9.5%, and whom the referring physicians considered to have management problems, were eligible. A final sample of 22 patients was included in the effectiveness study. The mean age was 58.5 (+/- 10.3) years and 63.3% were women. About 91% of the patients had type 2 diabetes. It was not stated whether some
of the patients were excluded from the initial study sample or refused to participate for any reason.

**Study design**

This was a retrospective within-group comparison study. All of the patients in the initial group received standard care (pre-enrolment period) and DCC care (post-enrolment period). The sites where the study was conducted were not described. Medical charts were used to extract information on the study patients for two years (one year for each of the pre- and post-enrolment periods). Thus, both periods were analysed retrospectively. No patient was lost to follow-up.

**Analysis of effectiveness**

All of the patients included in the initial study sample were considered in the effectiveness study. The primary health outcomes used in the analysis were HbA1c concentration, the number of additional patients achieving glycaemic control, blood pressure control, weight, and cholesterol and triglyceride levels. Glycaemic control was defined as an HbA1c concentration of 8.0% or less.

**Effectiveness results**

The mean level of HbA1c concentration decreased from 10.2% (pre-enrolment period) to 8.5% (post-enrolment period), (p<0.001).

Nine additional patients achieved glycaemic control.

In terms of blood pressure control, the mean blood pressure decreased from 153/80 mmHg (pre-enrolment period) to 138/73 mmHg (post-enrolment period), (p<0.01).

No statistically significant differences were found in terms of weight and levels of cholesterol and triglycerides.

**Clinical conclusions**

The effectiveness analysis showed that the DCC was effective in improving glycaemic and blood pressure control among diabetic patients.

**Measure of benefits used in the economic analysis**

The benefit measure used in the economic analysis was the number of patients achieving glycaemic control. This was derived directly from the effectiveness study.

**Direct costs**

A 3% annual discount rate was used since the costs were incurred during 2 years. The unit costs were not analysed separately from the quantities of resources used. The health services included in the economic evaluation were treatment of acute diabetes complications (hospitalisation and emergency department visits) and usual diabetes care (prescription medication, laboratory tests and outpatient physician visits). The cost/resource boundary was that of the health plan, thus charges rather than costs were used. The charges came from the SWHP. Resource use was estimated from patient medical records from 1998 to 2000. The price year was 2000.

**Statistical analysis of costs**

The costs were treated deterministically.

**Indirect Costs**

The indirect costs were not considered.
Currency
US dollars ($).

Sensitivity analysis
Sensitivity analyses were not conducted.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The annual pre-enrolment costs were $131 for the emergency department, $243 for hospitalisations, $1,562 for outpatient visits, and $109 for miscellaneous resources. The corresponding costs post-enrolment were $85 (emergency department), $177 (hospitalisations), $2,619 (outpatient visits) and $669 (miscellaneous resources), respectively.

The total annual costs were $2,045 in the pre-enrolment period and $3,550 in the post-enrolment period.

Synthesis of costs and benefits
Average and incremental cost-effectiveness ratios were calculated to combine the costs and benefits of the two study interventions (standard care versus DCC). The average cost per patient with glycaemic control was $15,000 pre-enrolment and $6,500 post-enrolment. The incremental cost per patient achieving glycaemic control with DCC relative to standard care was $3,680.

Authors' conclusions
The analysis showed the effectiveness of a multidisciplinary diabetes care clinic (DCC) in improving diabetes control among patients with poor control of their disease. The complexity of the intervention, along with the behavioural characteristics of the patients selected for the study, gave rise to anticipated increased short-term costs.

CRD COMMENTARY - Selection of comparators
The rationale for the choice of the comparator was clear. The new DCC was compared with the standard care used before the introduction of the new service. However, the authors did not provide many details of the comparator. You should decide whether it represents a valid comparator in your own setting.

Validity of estimate of measure of effectiveness
The analysis of the effectiveness used a within-group comparison study, which was appropriate for the study question as it avoided the problem of recruiting an adequate comparison group. Indeed, a single group of patients experienced the interventions being compared in the study. The study sample was representative of the specific study population. However, the study was retrospective and the patients' assessment was based on data derived from medical charts. The authors acknowledged that the sample size was small. There was no evidence that the initial study sample was appropriate for the study question. Only limited details of the patients' enrolment were provided. The time horizon of the analysis was quite short. These issues tend to limit the internal validity of the analysis.

Validity of estimate of measure of benefit
The benefit measure was derived from the effectiveness study.

Validity of estimate of costs
The perspective adopted in the study was explicitly stated. It appears that all the relevant categories of costs have been
included in the analysis. The price year was reported, thus facilitating reflation exercises in other settings. However, charges rather than true costs were used, although the authors stated that charges were relevant for the selected perspective. The costs were treated deterministically. The costs and resource use were not analysed separately, thus the reproducibility of the study in other settings would be difficult. The cost estimates were specific to the study setting and sensitivity analyses were not performed. The authors stated that, due to the short time horizon of the analysis, it was not possible to estimate the potential cost-savings that would occur in the long term on account of better glycaemic control.

Other issues
The authors made several comparisons of their findings with those from other studies. The authors raised two problematic points concerning the generalisability of the study results to other settings. First, the study sample referred to a very selected population of diabetic patients (those with problems with advanced and complicated disease), thus the results of the study may not be generalisable to the whole population of diabetic patients. Second, caution is required when extrapolating the study results to other multidisciplinary clinics because of the specific characteristics of the SWHP. Accordingly, the external validity of the analysis is low.

Implications of the study
The study results suggested that the use of a multidisciplinary clinic service led to improved glycaemic control among patients with complicated diabetes. The costs of the service tended to be higher in the short term due to the need for extra outpatient visits and more drug prescriptions. However, the authors stressed that cost-savings may be expected in the long term.

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None stated.

Bibliographic details

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Subject indexing assigned by CRD

MeSH
Blood Glucose; Blood Pressure Determination; Community Health Services /organization & administration; Cost-Benefit Analysis; Diabetes Mellitus, Type 1 /rehabilitation /therapy; Diabetes Mellitus, Type 2 /rehabilitation /therapy; Diet, Diabetic; Dietetics; Endocrinology; Humans; Patient Care Team; Patient Education as Topic; Pediatrics; Primary Health Care /organization & administration; Specialties, Nursing

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