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BMJ 2005;330:662-665
doi:10.1136/bmj.330.7492.662

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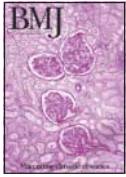
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Malcolm W Battersby and the SA HealthPlus Team

How can care for chronic illness best be coordinated? An Australian study sought to move towards collaborative and patient centred planned care

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BMJ 2005;330:662-6

Chronic illnesses contribute 60% of the global burden of disease, which by the year 2020 will increase to 80%.¹ With ageing populations, no developed country can afford the projected increase in costs of chronic illness. To address this crisis, governments and healthcare organisations in developed countries have initiated programmes aimed at shifting the focus of health care from acute illness to chronic illness. Australian governments have initiated health reform using trials of coordinated care. We describe the largest of these trials, SA HealthPlus, its aims, outcomes, and lessons learnt.

The problem

In Australia, state and commonwealth governments share the financing of health—the states being responsible for hospitals and the commonwealth being responsible for primary care. This has provided financial and clinical barriers to the management of care for people with chronic illnesses. General practice is funded on a fee for service basis, reinforcing a reactive rather than a planned model of care. This has led to poor coordination and inadequate attention to prevention of crises and complications of chronic illness. Public hospitals face excessive demand and bed shortages. Emergency departments are under pressure, with patients waiting unacceptably long periods for assessment and admission.

The questions

The SA HealthPlus trial asked several questions. Can coordination of care for people with multiple service needs, where care is accessed through individual care plans and funds pooled from existing commonwealth and state programmes, result in improved individual client health and wellbeing within existing resources? Given a research design, would the trials facilitate health reform to help general practice to move towards collaborative and patient centred planned care? Would hospitals become partners with the primary care system, and would funding reward outcomes rather than output?

The evidence

Innovative models aiming to improve outcomes in chronic care have been described as managed care, integrated care, disease management, coordinated care, and case management. Determining which models are most successful is difficult because there are no agreed definitions of each model and because of overlap of components between models. All models are multi-component, and research designs have not compared different types of interventions to find the most effective.

A review of coordinated care defined coordinated care as targeting “at risk” people with assessment of medical, functional, social, and emotional needs; provi-

sion of optimal medical treatment, self care education, and integrated services; and monitoring of progress and early signs of problems.² The aim of coordinated care was to improve health outcomes and reduce costs. Programmes were divided into either disease management or case management. Case management targeted complex patients, who had multiple conditions and social problems. Disease management targeted patients with a single diagnosis. Staff in both models were nurses. A common feature of successful programmes was the defining of patients’ problems and setting goals for each problem.

A meta-analysis of disease management, which incorporated case management, found that improved disease control was associated with education of providers, reminders, and feedback, and with education of patients, reminders, and incentives.³ A systematic review of disease management for depression found evidence of improvements in depressive symptoms and adherence to treatment but more admissions to hospital and increased costs.⁴

Disease specific programmes have dominated the literature yet do not address the clinical reality that patients and their health providers have to deal with more than one condition. The programmes reviewed above highlight conceptual confusion in the care of chronic illness, and although several interventions were effective, the cost savings were equivocal. In some instances the patient’s doctor had no involvement, suggesting that the models would not be sustained. As a way forward, elements of successful programmes for chronic disease have been organised under the six domains of the chronic care model.⁵ The SA HealthPlus model incorporated these elements into its design and developed a generic model of care rather than a disease specific model of care.

Implementation

One million of South Australia’s 1.5 million people live in Adelaide, the remainder in rural and remote areas. The trial aimed to create a fundamental shift from a funding based model of care to a population outcomes based model of care. Compared with purely experimental trials, this programme was developed as eight projects in four regions to inform a statewide implementation of coordinated care. The trial was conducted between July 1997 and December 1999. The projects had either geographical or randomised control groups allocated to intervention or control in the ratio of 2:1.⁶

Inclusion criteria

The four regional subtrials consisted of eight projects: diabetes (two projects), cardiac, respiratory (two



Details of SA HealthPlus Team are on bmj.com

projects), care of aged people, somatisation, and chronic and complex conditions. Eligibility to enter the trial included a hospital admission in the 12 months before enrolment and frequent use of visits to a general practitioner (more than eight a year) or emergency visits (more than four a year). Participants were aged 18 and over except for the western diabetes project and southern aged care project, where participants were over 65. During the recruitment phase, the requirement of prior admission to hospital was relaxed to achieve recruitment targets and to accommodate some general practitioners who considered that their patients with complex problems would benefit.

The model of care

The generic model of assessment and care planning incorporated disease specific evidence based guidelines that recommended services to be delivered over 12 months. The role of service coordinator was provided mainly by nurses, who conducted an assessment of patient defined life problems and goals, collated information from other providers, and initiated the care plan. They provided support and coordination for self management but did not provide disease specific services. The general practitioners as care coordinators completed a medical assessment and, with the patients, finalised the care plan, allocating services based on one of three levels of severity. Care mentors participated in case conferences and mentored care coordinators. The care mentor group modified care plan guidelines as part of continuous improvement.

Patient centred care was formalised by the problems and goals assessment, a semistructured interview originally developed for psychiatric disorders.⁷⁻¹⁰ The patient's perception of their main life problem, self rated on a 0-8 scale, was incorporated into the care plan. This signified a shift away from a focus on disease.

The cost of usual care was based on the cost of service use in the control group. Admission diagnoses were defined as either fully (1.0) or partially (0.5) preventable. Each project aimed to achieve a 50% reduction in preventable admissions over two years, thereby improving outcomes within existing resources.

Outcome measures

The SF-36,¹⁰ which measures quality of life on eight domains, was administered to intervention and control patients by post at enrolment, 12 months, and the end of the trial. The rating for problems and goals by patient and service coordinator was used as an outcome measure with intervention patients. Ratings were made monthly, then every three months. Costs and data for medical services, drugs, inpatient admissions, metropolitan domiciliary services, and district nursing services were tracked. Hospital data on outpatients and emergency presentations were not available. Qualitative data included surveys, focus groups, and interviews.

Results

Project specific outcomes have been described elsewhere.¹¹⁻¹⁶ Overall, 3115 intervention patients, 1488 control patients, and 287 intervention group general practitioners were recruited (table 1).

Table 1 Number of patients enrolled in SA HealthPlus projects

Project	Type of controls	Intervention group (n=3115)	Control group (n=1488)
Central region cardiac	Randomised	271	138
Southern region:			
Respiratory	Randomised	165	82
Somatisation	Randomised	90	35
Aged care	Randomised	632	310
Eyre Peninsula region:			
Diabetes	Geographical	398	111
Chronic and complex	Geographical	955	402
Western region:			
Respiratory	Geographical	223	154
Diabetes	Geographical	381	256

In total, 1900 (61%) intervention patients and 841 (57%) control patients remained in the trial until December 1999. In July 1999, when reconsenting was required to extend the trial, 1059 (34%) intervention patients and 238 (16%) control patients had withdrawn. Withdrawals included 158 (5.1%) of intervention patients and 86 (5.8%) control patients who had died.

Two projects showed improvements in SF-36 mental health domains and four showed improvements in both physical and mental domains compared with controls (table 2).

Problems and goals

Goals were coded according to improvement (at least 1 point), no change, or deterioration (at least 1 point) between the first and last ratings. Between 992 (40%) and 1487 (60%) of patients made some progress towards achieving their goal. Achievement in indig-

Table 2 Difference (end of trial minus baseline) in SF-36 scores that were significantly different between intervention and control groups, by project. Values are means (SD)

Project	Intervention group	Control group
Central region		
Cardiac: (n=99) (n=57)		
Role physical component summary	2.30 (9.45)	-1.91 (8.35)
Role limitation from physical problems	10.6 (44.48)	-6.58 (41.33)
Bodily pain	2.19 (21.29)	-7.51 (26.89)
General health	2.90 (15.47)	-1.49 (19.41)
Vitality	4.44 (17.79)	-3.33 (19.05)
Eyre Peninsula region		
Chronic and complex: (n=443) (n=195)		
Role physical component summary	1.05 (9.87)	-1.09 (10.2)
Limitation of physical activities	1.76 (19.69)	-2.41 (20.53)
Social limitations	2.15 (28.41)	-3.59 (27.69)
Southern region		
Respiratory: (n=85) (n=47)		
Vitality	2.94 (20.45)	-2.34 (16.18)
Care of elderly people: (n=299) (n=150)		
Role physical component summary	0.50 (10.82)	-2.06 (10.43)
Role limitation from physical problems	3.76 (46.75)	-6.83 (44.31)
Social limitations	-1.17 (30.03)	-9.00 (27.29)
Western region		
Respiratory: (n=83) (n=67)		
Role mental component summary	2.93 (15.13)	-3.75 (13.76)
Social limitations	2.71 (34.71)	-11.0 (31.87)
Mental health	5.93 (17.87)	-4.48 (16.41)
Diabetes: (n=132) (n=97)		
Role physical component summary	0.53 (10.19)	-2.52 (9.71)
Limitation of physical activities	-2.73 (21.27)	-8.11 (19.13)
Bodily pain	3.12 (26.10)	-3.31 (21.87)
Social limitations	-3.23 (30.68)	-9.79 (22.55)

Higher score=improved health status.

enous patients (59; 58.4%) was similar to other patients with diabetes in the Eyre Peninsula project (195; 56.3%).

When projects were combined, 1401 (55%) patients set their first goal in exercise, diet, or activities. Overall, 586 (23%) first goals related to maintaining the patient's current activities. Up to 1487 (60%) of patients and service coordinators rated their problem as improved. Significantly positive correlations were found between the SF-36 and difference in scores for problems and goals; however, the correlations were of low strength (Spearman correlations $r \leq 0.12$).

Service use

Control group patients who were geographically isolated differed from matched intervention patients in use of services before the trial, so data on service use was recalibrated by adjusting for inpatient, medical, and pharmaceutical services for the two years before enrolment. The southern and central regions showed no significant change. In the Eyre Peninsula chronic and complex project, compared with the control group, fewer admissions in the intervention group were accounted for by an increase in emergency admissions. In the Western projects, an increase in admissions in the intervention group was due to an increase in elective admissions. Use of medical services or drugs did not differ significantly between intervention and control patients. Intervention patients used more domiciliary services. Savings in admissions were not sufficient to pay for service coordination and additional community services. Coordination costs were high, with all patients receiving service coordination throughout the trial. However, service coordinator roles in trial development, data collection, and provider education were not separated from trial costs.

Lessons from the trial

A generic model of coordinated care was successfully implemented for people with a wide range of chronic conditions in both rural and urban settings. Improved wellbeing was achieved, with evidence suggesting that the key components of the model were the problems and goals approach, the care plan, and service coordinators working with general practitioners and patients. The semistructured assessment initiated self management support, a core element of the chronic care model.¹⁷ The finding that the key determinant of coordination was self management and not severity of illness led to the development of the partners in health

self management assessment and care planning process to target education to the individual.^{18, 19} This model has become the basis of clinician led self management support in the National Sharing Health Care initiative.²⁰

Patients who benefited most were not linked with services, lacked knowledge of their condition, were depressed, lacked motivation to change behaviour, and had lifestyle risk factors or poorly controlled conditions. Some patients had minimal benefit, needing coordination for a short time or being already well coordinated.

Better targeting of patients is required to achieve cost savings within a short period. Original selection criteria included at least one admission to hospital in the 12 months before enrolment. Table 3 shows costing data segmented to include only this group.

The reduction in the deficit by over \$A2m results not only from increased hospital savings, but from substantially reduced coordination costs.

Cost neutrality was affected by incomplete adherence to the care plan by the doctor or patient, limited availability of services, insufficient time to reduce complications, and an increase in service use from thorough assessment and patient demand.

Implementation of organised care for chronic illness in Australia requires commitment from state and commonwealth governments to pool funds and information systems that provide population data and decision support. A change in the business processes of general practice will be required. Some elements of health reform have been achieved with the creation of item numbers for general practitioners to provide health assessments, care planning, and case conferences.²¹ A large scale collaborative to introduce organised care of chronic illness into general practice is in the planning stage.²²

During the trial, a change of state government led to a loss of momentum for health reform. A new state government instituted the generational health review, which has recommended a need to integrate care for chronic illness, enhance primary care networks, and implement self management programmes.²³ Governments need to balance the competing risks of offending entrenched professional interests against not addressing the crisis in care of chronic illness.

Conclusions

A generic population based model of coordinated care was feasible and resulted in improved health outcomes

Table 3 Comparison of costs (\$) between intervention and control patients for all patients and those who had an admission in 12 months before enrolment, July 1997 to December 1999

Variable	Net difference between intervention and control patients (% variation)	
	All patients recalibrated	12 months' patients* recalibrated
All projects:		
Hospital inpatient	252 584 (2.7)	958 470 (12.2)
Medical Benefits Schedule	-2 755 (-0.1)	60 229 (2.7)
Pharmaceutical Benefits Schedule	-107 499 (-3.8)	-57 001 (-3.4)
Other community services	-212 991	-117 186
Subtotal	-70 662	844 510
Coordination†	4 772 236	2 567 274
Approximate net resource savings	-4 842 898 (-28.6)	-1 722 764 (-13.9)

\$A1.00=£0.41; €0.59.

*Only patients with at least one hospital admission in 12 months before start of trial.

†Includes costs of recruitment, care planning, and coordination.

Summary points

Barriers to coordinated care for chronic illness in Australia include multiple sources of funding, and general practice that focuses on acute care, with doctors working individually, not in teams

Definitions of managed care, coordinated care, and disease management models have not been agreed

SA HealthPlus successfully implemented a generic model of coordinated care with improved health outcomes but savings that were not sufficient to pay for all coordination costs

Self management capacity is a necessary component of assessment in determining allocation to coordinated care for chronic conditions

in both rural and urban settings. Cost savings were not sufficient to pay for coordinated care. However, the contribution to costs by service coordinator non-clinical roles suggests that a longitudinal study (five to 10 years) is required to assess the effects of service substitution on costs. Service coordination was found to be a necessary additional role than is currently available in the Australian health system. Better targeting of coordination should be based on prior admission to hospital and a potential to improve self management.

Source data was obtained from local and national evaluations of the coordinated care trials.

Contributors: Members of the SA HealthPlus Team participated in the conception and design of the study, data collection and analysis, or work-up and review. MWB is guarantor for the paper. The guarantor accepts full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

Funding: This project was supported by grants from the South Australian Department of Human Services and the Commonwealth Department of Health and Ageing.

Competing interests: None declared.

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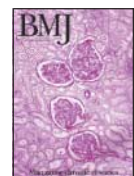
(Accepted 14 February 2005)

Commentary: Trials should inform structures and processes needed for tailoring interventions

Jean Macq

Coordinating care for people with multiple needs is inherently complex as it relies strongly on social dynamics at various levels of the health systems. Designing fruitful regulation policies to make care efficient requires a proper systems analysis for tailoring the care model to the context. The SA HealthPlus trial was original for its ambition to test one coordinated care model for people with multiple needs across different chronic conditions and local healthcare

systems in South Australia, and it seems to have been tailored realistically to local services and needs.¹ The key elements—targeting patients who need coordinated care, the general practitioner's role as a care coordinator, and a tool for patient self management—have to be tested further in the Southern Australian context. As for similar programmes tested for one chronic condition,² results regarding cost and effectiveness are mixed: the overall implementation of the SA



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