

• CASE-MANAGING LONG-TERM CONDITIONS

**What impact does it have
in the treatment of older people?**

Ruth Hutt

Rebecca Rosen

Janet McCauley

Case-managing Long-term Conditions

WHAT IMPACT DOES IT HAVE IN THE TREATMENT OF OLDER PEOPLE?

RUTH HUTT
REBECCA ROSEN
JANET MCCAULEY

Case management is being developed across the NHS as a tool for improving care for patients with long-term conditions. This review of the published literature on case management for older people examines the evidence base for the impact of case management on hospital admissions, lengths of inpatient stay, use of emergency facilities, health care costs and patients' functional ability. The findings are discussed in the context of current NHS policy.

About the authors

Ruth Hutt's current policy interests include chronic disease management, population health and workforce issues. Ruth's background is in public health. Prior to joining the King's Fund she worked for two former health authorities and a primary care trust in south London as part of public health specialist training. She has a clinical background in nursing.

Rebecca Rosen works half-time as a Fellow in Health Policy at the King's Fund and half-time as a GP in south-east London. Her current health policy interests include the management of long-term conditions, new professional roles in primary care and access to specialist care. Her work on long-term conditions spans national policy analysis and improving the organisation of local primary care services. Rebecca is a trustee of Asthma UK and Chair of a small charity promoting closer relationships between scientists and artists.

Janet McCauley's current interests are physician organisation, workforce issues, and quality and utilisation management. She trained in the United States in health policy and administration, and was a visiting Fellow in Health Policy at the King's Fund. Her clinical background is in women's health and she participates in the American College of Obstetricians and Gynecologists practice management and coding/nomenclature committees. She is currently working as a medical director for a large US health care company.

Published by:

King's Fund
11–13 Cavendish Square
London W1G 0AN
www.kingsfund.org.uk

© King's Fund 2004

Charity registration number: 207401

First published 2004

All rights reserved, including the right of reproduction in whole or in part in any form.

Available from:

King's Fund
11–13 Cavendish Square
London W1G 0AN
Tel: 020 7307 2591
Fax: 020 7307 2801
www.kingsfund.org.uk/pdf/casemanagement.pdf

Edited by Jane Carroll
Typeset by Grasshopper Design Company

Contents

Summary	1
Introduction	5
What is case management?	6
Aim of this review	7
How the studies were selected	7
Overview of studies	9
1 Research findings	11
Admissions to hospital	15
Emergency department visits	15
Length of stay or hospital days	16
Functional status	16
Costs	17
2 Discussion	18
Evidence remains limited	18
Transferability of findings to the NHS	19
3 The way ahead	21
Recommendations	21
References	23

Summary

Case management is being developed across the National Health Service (NHS) in England as a tool for improving care for patients with long-term conditions. This review examines evidence for the effectiveness of case management for older people.

Managing long-term conditions

The management and care of patients with long-term conditions has become a priority for the NHS. A Public Service Agreement target was announced earlier this year (2004) to reduce the number of emergency-bed days by 5 per cent from next year. This is set against a trend of rising emergency admissions, many of which are of elderly patients with multiple chronic diseases. The Government's framework for long-term conditions aims to contribute to this target by promoting three broad approaches to improve care:

- case management, or the provision of intensive, personally tailored care to the 3–5 per cent of people at greatest risk of hospital admissions
- disease management to provide ongoing monitoring and review of patients with less severe clinical symptoms
- support for self-management for the 70 per cent of people living with long-term conditions whose symptoms are largely stable.

These initiatives are in addition to ongoing work to improve long-term care, driven by various National Service Frameworks.

What is case management?

Case management has been defined as the process of planning, co-ordinating, managing and reviewing the care of an individual.¹ The broad aim is to develop cost-effective and efficient ways of co-ordinating services in order to improve quality of life.²

There is no single model of case management, and the term is used to describe a range of approaches to improve the organisation and co-ordination of services for people with severe, complex health problems. Many forms of case management already exist in the NHS and new arrangements are emerging. The core elements of case management are case finding or screening, assessment, care planning, implementation, monitoring and review. They may be undertaken as the specific job of a 'case manager' or as a series of tasks fulfilled by members of a team.

Examining the evidence

Recent evaluation of case-management pilots in England has shown that 3 per cent of patients over 65 years old account for 35 per cent of admissions.³ By targeting this 3 per cent of patients with case management, Primary Care Trusts (PCTs) are expecting to see a reduction in emergency hospital admissions as a result of ‘upstream’ care to prevent deterioration and emergency admission.

This review of the published literature sets out to examine the evidence base for case management in the context of the public service targets to reduce the use of emergency hospital beds and current interest in improving long-term care for older people with complex problems.

This review summarises the results of 19 studies evaluating the impact of case management, targeted primarily at older people, on use of health services including hospital admissions, lengths of stay and use of emergency departments. Studies were identified from North America and Europe. Of the studies included, 14 were randomised control trials (RCTs), three were non-randomised control trials and the remaining two were before-and-after studies. The goals and design of the case-management interventions varied between studies.

What we found

In the review we looked at five outcome measures. Hospital admissions, use of emergency departments and length of stay were examined because reducing emergency hospital-bed use is a key Department of Health policy aim. We looked at costs in order to gauge the overall cost-effectiveness of case management compared with traditional systems of care, and functional health status was examined as a non-financial patient outcome measure.

Hospital admissions

There is currently weak evidence for the effectiveness of case management in preventing admissions to acute care in elderly patients. Of the studies reviewed, five (only two of which were RCTs) demonstrated significant reductions in admissions, seven found no difference, and four found reductions in admissions that did not reach statistical significance. Two showed non-significant increases in admissions.

Use of emergency departments

There is no consistent effect on the use of emergency departments following case management: three studies showed significant reductions in attendance, two showed significant increases and a further three showed non-significant increases.

Length of stay

Most studies showed decreases in hospital-bed days associated with case management: three studies (including one RCT) had significant decreases; two studies showed non-significant increases in lengths of stay.

Functional health status

In four studies, case management improved functional status or prevented deterioration. In no study did case management have an adverse effect on functional status.

Costs

It was not possible to directly compare costs between studies, owing to differences between the studies in the components they included in costs.

Key messages

While there is some support in the literature for case management as a method of reducing the use of hospital beds, the evidence is not conclusive. The variety of case management arrangements under investigation makes it hard to generalise results to local NHS settings.

- There is some limited evidence that case management for older people can reduce use of health services. The evidence that exists is drawn from studies of different populations of older people living in different settings and countries.
- Many different models of case management exist and this review did not find evidence for the superiority of any particular model. American models of case management, around which current policy on case management has evolved in England, differ in context from the target populations of current NHS policy.
- In the absence of evidence for any specific model of case management, PCTs should clarify the needs that they are trying to address and then consider how to organise services in order to address these needs. This may be possible by adapting existing services or may require the development of new systems and services.
- Evidence for the cost-effectiveness of case management is limited. Further evaluation is needed to establish whether the costs of providing case management are offset by savings from reduced service utilisation.
- PCTs should be given flexibility to develop their own arrangements to improve care for patients with long-term conditions, taking into account existing local services and local needs. Case management is unlikely to provide an 'off-the-shelf' solution to achieving the required reductions in emergency admissions.
- Primary and community care services in the NHS are more comprehensive than in other countries. Elements of case management may already be in place in existing NHS services.
- Little has been written about how case management arrangements should link with other parts of health and social care.

Recommendations

- ✓ PCTs need to be very clear about the needs of the population at whom case management is targeted. This will inform decisions about how best to develop it, who should provide it, and the range of services that should be in place to ensure that it is effective.
- ✓ Local discussion is needed about whether case management is best developed by adapting existing services or whether new arrangements should be put in place.
- ✓ Case management should be developed in close collaboration with social care providers to ensure that an appropriate range of health and social care services is available to prevent hospitalisation.
- ✓ In addition to identifying people who will benefit most from case management, PCTs need to ensure that services are in place for people with less severe illness who nevertheless have significant health and social care needs.
- ✓ All case-management initiatives should be evaluated in terms of their impact on the use of health services (including primary care) and patient satisfaction.

Introduction

Improving the management of chronic diseases (also known as long-term conditions) is now a top policy priority for the National Health Service (NHS). Quite apart from their impact on overall quality of life, chronic conditions result in high health service utilisation. With an ageing population, more people are living with multiple illnesses and associated social care needs.

Chronic diseases are among the costliest to treat, and account for around a third of emergency admissions to NHS hospital beds in the over-65s. There is considerable variation between primary care trusts (PCTs) in admission rates for these conditions. This has led to increasing interest in chronic disease management models as a method of improving management and quality of life for patients with long-term conditions.

With an extensive network of general practitioners (GPs) and community health services, community-based management of common chronic conditions is already well established in the NHS. The 1990 General Medical Services contract introduced payments for chronic disease clinics and many GPs and practice nurses have been providing such care for years. Yet there are still major deficiencies in the routine monitoring and treatment of people with conditions such as asthma, diabetes, heart disease and high blood pressure.

In 2003, the King's Fund studied the chronic disease management provided through five leading US managed care organisations.⁴ This work described the widespread use of generic chronic disease management models and systematic and rigorous application of systems to monitor and treat patients living with chronic diseases. This contrasts with the disease-specific improvement plans for NHS services described in a series of National Service Frameworks. American models of chronic disease management focus both on the range of services that need to be in place for people with chronic diseases and on tailoring the intensity of care provided to match the severity and complexity of patients' needs.

Emerging policy for the NHS is driving the development of three tiers of care: case management to provide intensive support for those with severe, complex problems, who are most at risk of hospitalisation; disease management to provide ongoing monitoring and review of patients with less severe clinical symptoms; and support for self-management for the 70 per cent of people living with long-term conditions whose symptoms are largely stable.

'Case management' is a generic title for a range of approaches to improve the organisation and co-ordination of services for people with severe, complex health problems (see definition on p 6). Current interest in case management reflects developments in the United States where the intensive management of patients identified as most likely to use health care resources is emerging as a key cost-containment strategy.⁵ Health Secretary John Reid has called for case-management programmes to be established in each English strategic health authority and this is expected to contribute to the Department of Health target of a 5 per cent reduction in emergency hospital-bed days.

Nine PCTs are piloting the Evercare model of case management imported from America's United Health Group. This nurse-led service is targeted at older people at high risk of hospital admission. Studies of its US equivalent, based in large nursing homes, report substantial reductions in hospital admissions for people looked after by an Evercare nurse. Other PCTs are piloting chronic care services developed by US health care provider Kaiser Permanente and UK pharmaceutical company Pfizer.⁶ In addition, there are already many examples of case management provided by specialist nurses for people with specific diseases (such as heart failure or diabetes) within the NHS. These, too, aim to improve clinical management and prevent hospital admissions.

Given the current interest in case management, how strong is the evidence that it works? Do people understand what case management is? And how might new arrangements relate to the many services that already exist for people with chronic conditions? A review of evidence about case management is particularly timely as strategic health authorities and PCTs start to respond to policy directives to develop case management in the NHS.

This paper will review the literature on case management in the context of the current policy aim in England of reducing hospital admissions and lengths of stay.

What is case management?

Case management has been defined as the process of planning, co-ordinating, managing and reviewing the care of an individual.¹ The broad aim is to develop cost-effective and efficient ways of co-ordinating services in order to improve quality of life.²

It has its roots in social care, where it was developed as a mechanism for delivering holistic individualised care, tailored to the needs of people with complex health and social care problems. It has been widely used for people with learning and physical disabilities and severe mental health problems. It is also used for older people with complex health and social care needs, where a key goal has been to co-ordinate services needed to prevent long-term institutional care.

Within health services, nurse-led case management is increasingly used to manage people with one or more long-term conditions. Here the focus is primarily on clinical needs and the aim is to minimise symptoms and reduce hospitalisation. However, many patients have a complex mixture of health and social care needs. Their survival in the community typically requires a combination of health, social and other services and nurse case managers also have a key role in co-ordinating services from other health and social care providers.

Drawing on US research, Kane has identified a variety of uses of case management ranging across the health and social care spectrum:

- managing eligibility for services
- managing utilisation of services in high users to change their clinical course
- co-ordinating care from different providers to meet patients' needs
- disease management
- chronic care management.⁷

In each of these applications, assessment is a key component, but its focus may vary, from controlling access to services through to clinical assessment and providing and co-ordinating different services.

Core elements of case management

Whatever the broad aim, there are six core elements of case management and any or all of them may be used in a particular setting:

- case finding or screening
- assessment
- care planning
- implementation/management
- monitoring
- review.

Any or all of the core elements may be undertaken as the specific job of ‘a case manager’. Alternatively, they may be seen as ‘tasks’ or ‘roles’ that are fulfilled by different members of a multi-disciplinary team (this could be a health or a social care team, or a joint health and social care team).

Challis usefully identifies three features of case management (referred to in the social care sector as *care* management) that distinguish it from similar approaches such as intermediate care and enhanced discharge schemes.⁸ They are: the intensity of involvement, the breadth of services spanned, and the lengthy duration of involvement.

Effective case management can be provided in many ways. It requires individual practitioners – not confined to any particular professional group – with communication and collaborative working skills. At an organisational or team level, systems are needed to support case management (IT, training, supervision), as are processes to support patient-centred care (for example, care plans agreed with carer(s), advocacy and information). At a system-wide level, a range of services must be available to meet needs identified through assessments for case management. High-quality, intensive support from a highly skilled case manager may nevertheless fall apart if other necessary services (for example, twilight nursing or respite care) are not available.

We emphasise the diversity of approaches to case management because it is reflected in the research papers reviewed below, which describe varied interventions provided by different professionals and aimed at diverse populations in different settings.

Aim of this review

This review of published research on case management aims to:

- describe methods of patient selection
- evaluate the impact of case management on health care utilisation and patient health
- review the reported cost-effectiveness of case management.

How the studies were selected

Peer-reviewed papers on case management were identified through an electronic search of major research databases from 1996 to 2004. Of 415 papers identified only 118 were research papers. We assessed these papers for the quality of their methods, including sample size, clarity of the intervention, patient selection criteria and range of outcome measures used. Among those of high methodological quality, only 19 studies met our inclusion criteria, which were:

- case management provided by or linked to health care services with or without the inclusion of social care and other services
- case management intervention lasted at least three months
- the outcomes measured included a change in use of health care resources (although this may not have been the main focus of the study)
- studies of disease-specific models of case management if they reported both general and disease-specific service use and outcomes.

We excluded studies about:

- mental health case management (the subject of a prior systematic review⁹)
- hospital-based case management with no community/primary care component.

In view of current interest in case management for older people with chronic disease and complex needs, we restricted our search to studies in which the majority of subjects were over 65.

Three types of study were included in the review. These are described below:

- **Randomised controlled trials** (RCTs) are the gold standard for assessing the effectiveness of clinical interventions as they are able to minimise bias in the results by randomly rather than selectively allocating participants to an intervention. This process should ensure that factors that may affect the outcomes of the study (for example, severity of disease, age, smoking status) are equally distributed in the intervention and control groups. For this reason more weight tends to be given to the findings of RCTs.
- **Controlled trials** are studies in which subjects are allocated to the control or intervention groups using a method other than randomisation. This may cause the unequal distribution of patient characteristics such as age and disease severity between the groups, which can adversely affect study outcomes. As it is not always acceptable or practical to randomly allocate patients to intervention or control groups, controlled trials may be the preferred study design.
- **Before-and-after studies** use the period before the intervention as the control period, so that each patient or group acts as its own control. This design can be problematic as changes that occur over time other than because of the intervention may be responsible for the results. For example, a patient's condition may improve during the period of case management just because they have been on treatment for longer. Recorded improvements may be nothing to do with the case management intervention, but may be wrongly attributed to it.

Fourteen RCTs^{10–23} were selected for review, of which 12 included at least 200 participants. Two smaller RCTs were also included as they were of high quality and met the inclusion criteria.^{11, 20}

The remaining studies were either controlled studies (non-randomised)^{24–26} or before-and-after studies.^{27, 28} The design, size and patient-selection method used for each study is summarised with the results in Table 2 (see p 11).

Overview of studies

Case-management interventions

The papers included in the review described different models of case management with diverse goals. One had the primarily social care goal of preventing long-term admission to residential nursing care (although it also reported health outcomes).²⁹ Blue *et al* evaluated exclusively medical case management targeted at patients with heart failure.¹¹ Most combined elements of both social and medical care (see p 11).

All except one study included home visits and periodic reassessment or evaluation. Riegel *et al*'s study of heart failure patients provided case management by telephone.²¹ Reported roles of the case manager were care co-ordination (17 out of 19 studies), assessment, which may include clinical or needs assessment (15 out of 19) and patient education/self-management (10 out of 19). Only three studies described case managers as directly involved in care delivery^{24, 26, 27} (most co-ordinate care), and in two studies part of their role was determining eligibility for services.^{27, 30}

The intensity, mode and duration of case management varied considerably across the studies. Interventions ranged from assessment by the case manager (either in hospital prior to discharge or at home for patients identified in the community) with occasional telephone contact, through to regular intensive contact where case managers arranged and accompanied patients to medical appointments and were contactable 24 hours a day.

Case managers

The majority of case managers were registered nurses, often with masters-level qualifications. In one study, social workers were case managers¹² and five studies used a combination of the two.^{10, 16, 18, 19, 22} Case managers usually had extensive experience either in relation to older people or in chronic disease management. One study directly compared nurses and social workers as case managers and found no difference between them in terms of patient clinical outcomes.¹⁸

Patient selection

The papers reviewed used different methods to select the study population. These are presented in Table 1 (see p 10). Case management is targeted at those patients identified as at risk of hospital admission or intensive service use. There is no gold standard for identifying patients at highest risk of resource use. This inevitably means that case management may be provided for patients who were perhaps at low risk of admission, while others thought to be at low risk become frequent service users.

TABLE 1: PATIENT SELECTION CRITERIA		
Category	Assessment method	Number of studies using selected criteria
Predictive model ²⁸	Developed using a combination of ‘leading’ and ‘lagging’ indicators to highlight patients at risk of developing clinical complications and associated costs. Leading indicators are those that may predict a change or instability in the patient’s conditions, such as a change in medication. Lagging indicators are those that occur after an event, such as hospital admission.	1
Functional impairment ^{27, 29}	Based on the number of activities of daily living for which assistance is required. Level of dependence is used to predict patients who will benefit from case management to prevent need for residential care or hospital admission.	2
Recent resource usage ^{13, 17, 20, 21, 25}	Selected for case management following recent hospital admission/discharge or history of previous admissions. Often these are disease-specific admissions with the aim of case management to optimise symptom control.	5
Population programme ^{10, 15, 23, 24, 31}	Targeted for intervention on basis of demographic or service use group, regardless of other indicators. Case management input tailored to need, ranging from eligibility for additional services to intensive home care delivery.	5
Combination model ^{11, 12, 14, 18, 19, 22}	Used a combination of the above approaches, typically a combination of resource usage, functional impairment (often with a disease-specific element), or threshold for case management based on the number of chronic diseases.	6

1

Research findings

Table 2 summarises patient selection criteria and selected results for each study reviewed. The results are presented in the text by outcome measure, with randomised controlled trials (RCTs), providing the highest quality of evidence, presented first.

First author	Country	Intervention	Study design features				Outcome measures with direction of effect and statistical significance							
			Design	Number of participants	Patient selection criteria	Case manager	Hospital admissions	Emergency dept. visits	Length of stay	Cost	Functional status	Nursing home admission	Mortality	
Allen ²⁴	USA	<ul style="list-style-type: none"> • Skilled observation/assessment • 'Hands on' intervention • Management and evaluation of patient care plans 	controlled study	456	Population programme	Nurse	↓		↓					
Bernabei ¹⁰	Italy	<ul style="list-style-type: none"> • Initial assessment followed by bi-monthly assessments • Constant availability for dealing with problems • Monitoring services provision • Guarantee of extra help when requested by patients and GPs • Access to community geriatric evaluation units • Involvement of GPs in care-planning, meetings and emergency situations 	RCT	200	Population programme	Nurse or social worker	↓	↓	↓	↓	↓	↓	=	
Blue ¹¹	Scotland	<ul style="list-style-type: none"> • Home visits of decreasing frequency supplemented by telephone contact • Education of patients about heart failure • Optimising treatment (drugs, diet, exercise) • Monitoring electrolytes • Teaching self-monitoring and management to patients • Liaison with other health and social care services 	RCT	165	Combination	Nurse	↓		↓				↓	
Boult ¹²	USA	<ul style="list-style-type: none"> • Home visits • Communication with primary care physicians • Telephone contact 	RCT	6409	Combination	Social worker		=	↓	↓				

continued on p 12

TABLE 2: SUMMARY OF STUDY DESIGNS AND FINDINGS <i>continued</i>													
<p>Arrows show direction of effect, and colours denote statistical significance of findings.</p> <p> = $p \leq 0.05$ = $p \geq 0.05$ = not stated = no difference between groups </p>			Study design features				Outcome measures with direction of effect and statistical significance						
			Design	Number of participants	Patient selection criteria	Case manager	Hospital admissions	Emergency dept. visits	Length of stay	Cost	Functional status	Nursing home admission	Mortality
First author	Country	Intervention											
Boyd ²⁵	USA	<ul style="list-style-type: none"> Assessment and ongoing reassessment of needs Development of plans of care Referral and co-ordination of all health services Medication management Symptom management Crisis intervention Liaison for patients' caregivers and families Support counselling 	controlled study	54	Resource usage	Nurse	↓	↓	↓	↓		↑	
Fitzgerald ¹³	USA	<ul style="list-style-type: none"> Assessment (in hospital) Education of patients about their medical problems Facilitating access to usual care Identifying unmet medical and social needs 24-hour access to case managers Co-ordination of all appointments and liaison with primary care physicians and other services Alerting patients to early warning signs of deterioration, as well as giving medication advice Selection of face-to-face and telephone contacts 	RCT	668	Resource usage	Nurse	=	↑	↓				
Gagnon ¹⁴	Canada	<ul style="list-style-type: none"> Co-ordination of all health care providers Creation and implementation of plans of care Support during periods of transition from hospital to home, or changes in condition Minimum contact of a monthly phone call and six home visits 	RCT	425	Combination	Nurse	=	↑	↑		=	=	=
Hendriksen ¹⁵	Denmark	<ul style="list-style-type: none"> Assessment of patients Co-ordination of services where needs for social or medical services were identified Three visits, with telephone contact in between as necessary No physical examinations performed 	RCT	600	Population programme	Nurse	↓	↓	↓	↓		↓	↓
Kane ²⁶	USA	<ul style="list-style-type: none"> Training nursing home staff Direct patient care Communication with families, primary care physicians and nursing home staff Early recognition of problems and aggressive management preventing hospital admission 	controlled study	4804	Population programme	Nurse	↓	↓	↓			N/A	↑

continued on p 13

TABLE 2: SUMMARY OF STUDY DESIGNS AND FINDINGS *continued*

Arrows show direction of effect, and colours denote statistical significance of findings.

■ = p ≤ 0.05

■ = p ≥ 0.05

□ = not stated

■ = no difference between groups

First author	Country	Intervention	Study design features				Outcome measures with direction of effect and statistical significance						
			Design	Number of participants	Patient selection criteria	Case manager	Hospital admissions	Emergency dept. visits	Length of stay	Cost	Functional status	Nursing home admission	Mortality
Kemper ^{16, 29}	USA	<ul style="list-style-type: none"> Needs assessment Care planning Service co-ordination Monitoring Client advocacy 	RCT	NS	Functional impairment	Nurse or social worker	■				■	↓	■
Landi ²⁷	Italy	<ul style="list-style-type: none"> Comprehensive geriatric assessment Design and implementation of care plans (with geriatric evaluation units and GPs) Determining eligibility for services Co-ordinated delivery and integration of services 	Before and after	115	Functional impairment	Not stated	↓		↓	↓			
Laramee ¹⁷	USA	<ul style="list-style-type: none"> Discharge planning Referrals to multi-disciplinary teams, social services and home care Participation in ward rounds Progress reports to GPs Information and support to families Provision of education materials and information about self-monitoring to patients 	RCT	287	Resource usage	Nurse	■		↓	↓			
Long ¹⁸	USA	<ul style="list-style-type: none"> Home visits Reporting back to care teams Revision of care plans Making medical appointments and accompanying patients Arranged non-medical services, eg respite, meals on wheels, nursing home placement Medicaid eligibility Transport to and from appointments 	RCT	317	Combination	Nurse or social worker	↑		↑	↓			
Lynch ²⁸	USA	<ul style="list-style-type: none"> Assessment Identification of patient goals Co-ordination of clinical care 	Before and after	NS	Predictive model	Nurse	↓		=	↓	↑		
Marshall ¹⁹	USA	<ul style="list-style-type: none"> Home assessment visits Care plans agreed with family and GP Weekly reviews of care at weekly geriatric team meetings Monitoring patients through home and hospital visits Booking medical appointments and attending with patients Co-ordination of care and other social services, eg meals on wheels, respite 	RCT	290	Combination	Nurse or social worker	■	↓		↑	↑		

continued on p 14

TABLE 2: SUMMARY OF STUDY DESIGNS AND FINDINGS <i>continued</i>													
<p>Arrows show direction of effect, and colours denote statistical significance of findings.</p> <p> = $p \leq 0.05$ = $p \geq 0.05$ = not stated = no difference between groups </p>			Study design features				Outcome measures with direction of effect and statistical significance						
			Design	Number of participants	Patient selection criteria	Case manager	Hospital admissions	Emergency dept. visits	Length of stay	Cost	Functional status	Nursing home admission	Mortality
First author	Country	Intervention											
Pugh ²⁰	USA	<ul style="list-style-type: none"> Enhanced discharge planning Teaching patients to manage their own heart failure within physician-set parameters Ongoing nursing assessment Follow-up for six months through phone calls and visits 	RCT	58	Resource usage	Nurse	=	↑		↑	↑		
Riegel ²¹	USA	<ul style="list-style-type: none"> Telephone-based case management using software program with tools for data collection Setting priorities Patient education Telephoning patients within five days of discharge 	RCT	358	Resource usage	Nurse	↓	↑	↓	↓			
Schore ^{22*}	USA	<ul style="list-style-type: none"> Assessment Service co-ordination Condition-specific self-care Provision of emotional support to clients and informal care givers Differences between sites on levels of personal contact, structure of activities, use of nurses and social workers, emphasis on education and service co-ordination 	RCT	2382	Combination	Nurse or social worker	↑	=		↓			
							↓	=	↓	↑			
							↑	↑		↑			
Stuck ²³	USA	<ul style="list-style-type: none"> Annual home visit geriatric assessment, including physical examinations Discussion with geriatricians Recommendations to patients Three visits Patients encouraged to discuss their condition with their physician but no direct liaison between nurse practitioners and GPs 	RCT	414	Population programme	Nurse	=		↑	↑	↑	↓	↓

*There were three separate intervention groups in this study, the results of which are presented individually.

Source: King's Fund 2004

Admissions to hospital

Eighteen studies reported hospital admissions as an outcome. Only two RCTs found a significant difference between the control and intervention groups. Bernabei *et al* randomised patients receiving home care to usual care or case management.¹⁰ After one year, the relative risk of admission to hospital was 0.74 (0.56–0.97) in the case-managed group. Hendriksen *et al* found a statistically significant reduction in the incidence of multiple admissions in case-managed patients, among whom the risk of admission was 1.6 per cent per patient compared to 2.7 per cent per patient in the control group.¹⁵

A large controlled (non-randomised) study by Kane *et al* evaluating Evercare case management in nursing home residents reported a reduction in hospital admissions of almost 50 per cent in the intervention group.²⁶ However, this was almost exactly mirrored by an increase in the intensity of nurse support (known as ‘intensive service days’) in the nursing home where the patient was resident. Despite this increase in community nursing care, overall costs were significantly reduced (see Costs, p 17).

Results from the remaining RCTs are more equivocal. The ‘Channeling’ study, a large US evaluation of public financing of home care that included case management, showed no differences in hospital use between intervention and control groups.¹⁶ This was primarily a social care intervention aimed at preventing admission into long-term care by enabling case managers to purchase a range of health and social care services for their patients.

The study by Schore *et al* of patients receiving usual Medicare benefits or benefits plus ‘case management’ compared three different case-management interventions.²² It reported no significant difference in hospitalisation rates in any of the intervention groups.

Riegel *et al*’s study of nurse-led telephone case management of heart failure patients reported a statistically significant reduction in heart-failure-specific hospitalisations at three and six months of 46 per cent and 48 per cent respectively.²¹ However, a 28 per cent reduction in all-cause hospitalisations at six months became insignificant after adjustment for co-morbidity and use of beta-blockers at baseline.

Of the remaining studies, a before-and-after evaluation of additional home care services reported a statistically significant 10 per cent reduction in the number of patients admitted to hospital at least once following case management.²⁷ However, the study is methodologically problematic as it did not have clear inclusion criteria determined in advance. Another US study of Medicare case management using home-based nursing also found that the mean number of admissions to hospital or a specialist nursing facility was no different from that in one control group, but that it was lower than the rate in a second control group.²⁴ An overview of findings from the remaining studies is presented in Table 2 (see pp 11–14).

Emergency department visits

Eight RCTs reported outcomes that included emergency department (ED) visits.^{10, 12–14, 19–22} Only one (Bernabei *et al*) reported a statistically significant decrease in the use of the ED following case-management intervention (relative risk of attendance 0.64, 95 per cent confidence interval 0.48 to 0.85).¹⁰ Six studies reported no difference or no statistically

significant differences between study and control groups.^{12, 13, 19–22} A significant increase in ED use was reported in one RCT¹⁴ and in one of three intervention groups in the study by Schore *et al.*²²

Of the non-RCT studies, the Evercare evaluation²⁶ and one small RCT²⁵ showed a statistically significant reduction in the number of visits in the intervention group. However, the lack of randomisation makes interpretation of these findings problematic, given the number of well-designed RCTs that have failed to repeat them.

Length of stay or hospital days

Ten RCTs assessed lengths of stay in hospital or number of hospital days used following the implementation of case management.^{10–15, 17, 18, 21, 23} Bernabei *et al* found a 35 per cent overall reduction in the number of acute hospital bed days used after one-year follow-up in the intervention group.¹⁰ However, the mean length of hospital stay is similar in control and intervention groups, implying that the overall reduction is due to reduced admissions. (It was not reported whether this finding was statistically significant). Hendriksen *et al* found a statistically significant reduction in the overall number of bed days used in the intervention group of 24 per cent over three years.¹⁵ This equates to a reduction of 1,558 hospital bed days over three years.

The remaining RCTs found no statistically significant effects on overall length of stay associated with case management. One study of heart failure specialist nurse case management found a statistically significant reduction in length of stay following readmission for worsening heart failure (16.7 days in the usual care group versus 10.3 days in the intervention group) and a reduction of nearly 6 days in the average all-cause length of stay, but this effect was not statistically significant.¹¹ The RCT by Boulton *et al* on the effects of case management in 6,409 subjects receiving assessment and case management through a social worker reported a mean non-significant reduction in skilled nursing facility use of 0.28 days over one year but minimal difference in the use of hospital bed days (0.08 days).¹²

Of the non-randomised studies, Kane *et al* demonstrated a significant difference in mean length of hospital stay (5.5 days in case-managed patients and 6.7 days in controls).²⁶ The overall combined hospital and intensive nursing days used by Evercare patients was 45 per cent lower than in controls, owing to lower hospital admission rates. Landi *et al* also showed an overall reduction of ten hospital days per person and four days per admission in the six months after case management compared with the previous six months.²⁷ Four other non-RCTs did not find any significant differences associated with case management.

Functional status

Six RCTs reported functional ability as an outcome. Four showed positive results for case management patients compared with patients not receiving case management, in terms of either reduced decline in functional ability or an improvement in function. However, in only three of these studies did results reach statistical significance,^{10, 19, 23} and in one of these the differences are likely to be due to baseline differences in function.¹⁹ Two studies revealed no differences between control and intervention groups,^{14, 16} and one showing a positive finding

did not reach statistical significance.²⁰ The large US Channeling study showed no change in functional score but an increase in confidence and quality of life.¹⁶

Of the non-RCTs reporting functional status, one before-and-after study showed a positive effect associated with case management.²⁸

Costs

Nine studies evaluated some aspect of the costs of case management, although methodology varied considerably between studies, making comparisons problematic. Costs of case managers were included, as were nursing-home and hospital-bed days and ED visits. Use of primary-care physicians and other community staff was not always included. Furthermore, differences in reported hospital payment systems (for example, diagnostic-related group versus per diem payments) make comparison between studies difficult.

Among RCTs, four reported increased costs associated with case management^{19, 20, 22, 23} but none was statistically significant. Six reported cost reductions,^{10, 12, 15, 17, 21, 30} although only Riegel *et al*'s²¹ study of telephone case management reported this reduction to be statistically significant. The remaining studies did not report on the costs of case management.

2

Discussion

With rapid expansion in case management for people with long-term conditions, it is important to link its further development to evidence of clinical and cost-effectiveness. Though not a systematic review, this paper presents findings from a carefully selected group of international studies that contribute important information on this subject. Its focus on older people is highly relevant to current discussions about improving care for people with complex chronic conditions. However, as a group, older people may have particularly complex health and social care needs, and this makes it harder to generalise the results to other groups with long-term conditions.

Evidence remains limited

The studies reviewed vary considerably in respect of the aims of case management and the nature of the particular case-management intervention provided. This variability makes it difficult to pool results and highlights the importance of absolute clarity about the aims of new case-management arrangements primary care trusts (PCTs) might establish, and about the nature of the interventions required to fulfil those aims.

Overall, results are equivocal, with two large randomised controlled trials (RCTs) and three other studies reporting significant reductions in hospital use – a key National Health Service (NHS) policy aim. However, the studies differed considerably in their target population and overall aims and in the case-management intervention they evaluated. Three of the studies (two Italian^{10, 27} and one based in Denmark¹⁵) targeted older people in the community and, in this respect, are particularly relevant to current developments in the United Kingdom; however, they did not try to identify high-risk elders and offered a low-intensity form of case management.

Allen's study did identify high-risk patients (based on physiological, environmental, psychosocial and health-related behaviours), who then received nurse-led case management in the home.²⁴ Kane *et al*'s study took a population approach, providing nurse-led case management to all Evercare-enrolled elders in large US nursing homes.²⁶ Its adaptation for the NHS includes targeting the service at those at highest risk of hospitalisation and providing care in a person's own home. An ongoing evaluation, due to report at the end of 2004, will assess the extent to which Kane's impressive results are reproducible in this very different context.

Results from other evaluations vary, with several studies reporting both positive and negative effects across different outcome measures. Disease-specific studies reported significant reductions in disease-specific health care use that were not sustained across admissions for other causes. It is also important to remember that the gains seen in research and pilot projects may not be the same as those in a roll-out programme.

Despite our narrow selection criteria, the models of case management under investigation still varied. It was not possible to identify the individual components of different models that contributed to their overall impact, nor to draw definitive conclusions about the most effective form of case management. Furthermore, methodological limits to some studies and to the quality of economic evaluations – particularly the heterogeneity in what was included in the costs – also limit the conclusions that can be drawn. While there appears to be potential for case management to reduce hospital admissions, it remains unclear what contributes to success or failure and how cost-effective these services are.

Transferability of findings to the NHS

Other important issues relate to the transferability of international findings to the NHS. First, the overall economic and regulatory environment in which these services are offered varies between countries, creating different incentives for providers. This may make it harder to reproduce the utilisation patterns or cost savings reported in other countries. The introduction of Payment by Results within the NHS creates unpredictable incentives for acute trusts and PCTs. The opportunity for PCTs to commission more community services, including case management, could be constrained by the financial incentives for acute trusts to increase hospital activity.

Second, there are important differences in the training and skills of the staff providing case management. Many US nurse case managers have Masters degree-level training, raising further questions about the feasibility of transferring the findings of the US studies to the NHS. The roles that nurse case managers are able to fulfil will need to be tailored to their past experience and skills. Alternatively, intensive training and support can be used to develop new skills for case management, as seen in the PCT Evercare pilot sites.

Third, patient-selection techniques remain imprecise and cannot reliably predict who will benefit most from case management. The cost-effectiveness of case management depends on targeting it at people for whom the ‘upstream’ case management costs can be offset by avoided ‘downstream’ care. However, unless hospital beds are closed they are likely to be filled by the next most needy patients who are not case-managed. If beds *are* closed, need for community-based case management will increase.

The NHS already provides a range of hospital outreach and community-based services targeted at patients with chronic diseases, such as heart disease, diabetes and asthma. Other similar – although time-limited – services exist in the form of intermediate care and hospital-at-home schemes for older people. Given that components of case management could duplicate some of these services, it is important to be clear about the added value to be gained by case management and the way in which any new service will link with established providers. Developments in the Single Assessment Process also aim to improve the co-ordination of care between different providers and here too duplication or confusion between existing services and additional case management arrangements must be avoided.

The reasons why patients are admitted into hospital are complex and multi-factorial. Clinical problems and the quality of primary care are important determinants of hospital admissions. But clinical symptoms may be exacerbated by social and psychological factors. Carers’ needs, limited social networks, the patient’s ability to cope with their condition and manage their

symptoms may all play a part in admissions. Effective models of case management for people with complex, chronic conditions will need to combine intensive clinical care with the co-ordination of other health and social services.

From a patient's perspective, integration between different providers is an important determinant of the quality of care. Furthermore, the best case-management arrangements may fail to reduce hospitalisation if they are not developed in conjunction with social care and other services needed to maintain people in the community. PCTs will need to work closely with local authorities to increase overall capacity to support people selected for case management within the community.

PCTs are under pressure to reduce hospital use by people with long-term conditions, and case management may well contribute to achieving this. However, with many different ways of providing case management, there is still only limited evidence about which type is the most effective. Integrating case management with existing services will be a key challenge; this will raise questions about who should act as case managers, which of the core elements of case management they should fulfil, and whether it is better to develop case management by adapting existing services or by creating new ones.

3

The way ahead

The evidence presented here should contribute to the debate about the best ways to improve care for patients with long-term conditions. Case management is already being rolled out across primary care trusts (PCTs) and many are seeking advice from commercial companies to assist them in developing local models.

PCTs should develop their own arrangements to improve care for patients with long-term conditions, taking into account existing local services and local needs. Ongoing King's Fund analysis of hospital episode statistics for selected PCTs reveals a wide range of diagnoses in patients who are frequently admitted to hospital. These include repeated sickle cell crises and poorly-controlled asthma in children and adolescents, alongside conditions such as chronic obstructive pulmonary disease and heart failure in older people. A detailed knowledge of how different long-term conditions affect the local population is essential for the effective development of case management.

The implementation of case management within the National Health Service (NHS) should be an iterative process, building on and adapting local services where appropriate and developing additional approaches where local capacity is inadequate. The literature review suggests there is no 'ideal' model of case management that will fit all PCTs. It is essential to build up an evidence base from robust evaluations of emerging NHS case-management pilots, to inform future development in this area. The King's Fund is continuing to work with PCTs to further explore models of case management and the components that may benefit specific population groups.

The focus on health service utilisation as the 'success criterion' for measuring case management may be too narrow and the real dividend may be better quality of care for patients and an increase in patient satisfaction. This is still a worthy goal.

Recommendations

The literature review suggests there is no ideal model of case management which will fit all PCTs. The implementation of case management within the NHS should build on and adapt local services where appropriate. In view of this we have made the following recommendations.

- ✓ PCTs need to be very clear about the needs of the population at whom case management is targeted. This will inform decisions about how best to develop it; who should provide it; and the range of services that should be in place to ensure that it is effective.
- ✓ Local discussion is needed about whether case management is best developed by adapting existing services or whether new arrangements should be put in place.

- ✓ Case management should be developed in close collaboration with social care providers to ensure that an appropriate range of health and social care services is available to prevent hospitalisation.
- ✓ In addition to identifying people who will most benefit from case management, PCTs need to ensure that services are in place for people with less severe illness who nevertheless have significant health and social care needs.
- ✓ All case-management initiatives should be evaluated in terms of their impact on health service (including primary care) use and patient satisfaction.

References

1. Department of Health (2000). *Out in the Open: Breaking down the barriers for older people*. Department of Health.
2. Banks P (2004). 'Case management' in *Integrating Services for Older People: A resource book for managers*, Nies H, Berman P eds. Dublin: EHMA.
3. Evercare (2004). Implementing the Evercare Programme: Interim Report. Available at: <http://www.natpact.nhs.uk/uploads/Advancing%20the%20National%20Health%20Service%20Interim%202-04%20final.doc>
4. Dixon J, Lewis R, Rosen R, Finlayson B, Gray, D (2004). *Managing Chronic Disease*. London: King's Fund.
5. Robinson J, Yegian J (2004). 'Medical Management After Managed Care'. *Health Affairs*. Available at: <http://content.healthaffairs.org/cgi/reprint/hlthaff.w4.269v1>
6. Matrix research and consultancy (2004). *Learning Distillation of Chronic Disease Management Programmes in the UK*. Modernisation Agency. Available at: <http://www.natpact.nhs.uk/uploads/Matrix%20CDM%20Evaluation%20Report.doc>
7. Kane R. 'Changing the Face of Long-term Care', *The Journal of Aging and Social Policy* (in press).
8. Challis D (1995). 'Care management around the world'. *Care Plan*, vol 1, pp 10–14.
9. Marshall M, Gray A, Lockwood A, Green R (1998). Case management for people with severe mental disorders. *The Cochrane Database of Systematic Reviews* 1998, Issue 2. Art. No.: CD000050. DOI: 10.1002/14651858.CD000050
10. Bernabei R, Landi F, Gambassi G, Sgadari A (1998). 'Randomised trial of impact of model of integrated care and case management for older people living in the community'. *British Medical Journal*, vol 316, pp 1348–51.
11. Blue L, Lang E, McMurray J, Davie A, McDonagh T, Murdoch D *et al* (2001). 'Randomised controlled trial of specialist nurse intervention in heart failure'. *BMJ*, vol 323, pp 715–18.
12. Boulton C, Rassen J, Rassen A, Moore R, Robison S (2000). 'The effect of case management on the costs of health care for enrollees in Medicare Plus Choice plans: A randomized trial'. *Journal of the American Geriatric Society*, vol 48, pp 996–1001.
13. Fitzgerald J, Smith D, Martin D, Freedman J, Katz B (1994). 'A case manager intervention to reduce readmissions'. *Archives of Internal Medicine*, vol 154, pp 1721–9.
14. Gagnon A, Schein C, McVey L, Bergman H (1999). 'Randomized controlled trial of nurse case management of frail older people'. *Journal of the American Geriatric Society*, vol 47, pp 1118–24.
15. Hendriksen C, Lund E, Stromgard E (1984). 'Consequences of assessment and intervention among elderly people: A three year randomised controlled trial'. *British Medical Journal*, vol 289, pp 1522–4.
16. Kemper P (1998). 'The evaluation of the national long term care demonstration: Overview of the findings'. *Health Services Research*, vol 23, pp 161–73.

17. Laramée S, Levinsky S, Sargent J, Ross R, Callas P (2003). 'Case management in a heterogeneous congestive heart failure population: A randomized controlled trial'. *Archives of Internal Medicine*, vol 163, pp 809–16.
18. Long M (2002). 'Case management model or case manager type? That is the question'. *Health Care Manager*, vol 20, pp 53–65.
19. Marshall BS, Long MJ, Voss J, Demma K, Skerl KP (1999). 'Case management of the elderly in a health maintenance organisation: The implications for program administration under managed care'. *Journal of Health Care Management*, vol 44, pp 477–91.
20. Pugh L, Havens D, Xie S, Robinson J, Blaha C (2001). 'Case management for elderly persons with heart failure: The quality of life and cost outcomes'. *Medsurg Nursing*, vol 10, pp 71–8.
21. Riegel B, Carlson B, Kopp Z, LePetri B, Glaser D, Unger A (2002). 'Effect of a standardized nurse case-management telephone intervention on resource use in patients with chronic heart failure'. *Archives of Internal Medicine*, vol 162, pp 705–12.
22. Schore J, Brown R, Chek V (1999). 'Case management for high-cost Medicare beneficiaries'. *Health Care Financing Review*, vol 20, pp 87–101.
23. Stuck A, Aranow H, Steiner A, Alessi A (1995). 'A trial of annual in-home comprehensive geriatric assessments for elderly people living in the community'. *New England Journal of Medicine*, vol 333, pp 1184–9.
24. Allen S (1999). 'Description and outcomes of a Medicare case management program by nurses'. *Home Health Care Services Quarterly*, vol 18, pp 43–69.
25. Boyd M, Fisher B, Davidson A, Neilsen C (1996). 'Community-based case management for chronically ill older adults'. *Nursing Management*, vol 27, no 11, pp 31–2.
26. Kane R, Keckhafer G, Flood S, Bershadsky B, Siadaty M (2003). 'The effect of Evercare on hospital use'. *Journal of the American Geriatric Society*, vol 51, pp 1427–34.
27. Landi F, Gambassi G, Pola R, Tabaccanti S, Cavinato T, Carbonin P, Bernabei R (1999). 'Impact of integrated home care services on hospital use'. *Journal of the American Geriatric Society*, vol 47, pp 1430–4.
28. Lynch J, Forman S, Graff S, Gunby M (2000). 'High-risk population health management – achieving improved patient outcomes and near-term financial results'. *American Journal of Managed Care*, vol 6, pp 781–91.
29. Kemper P (1990). 'Case management agency systems of administering long-term care: Evidence from the Channeling demonstration'. *Gerontologist*, vol 30, pp 817–24.
30. Long M, Marshall B (2000). 'What price an additional day of life? A cost-effectiveness study of case management'. *American Journal of Managed Care*, vol 6, pp 881–6.
31. Kane R, Huck S (2000). 'The implementation of the Evercare demonstration project'. *Journal of the American Geriatric Society*, vol 48, pp 218–23.