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Permalink

<https://escholarship.org/uc/item/87x924d6>

Journal

BMJ, 325(7370)

ISSN

1468-5833

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Publication Date

2002-10-26

Peer reviewed

As good as it gets? Chronic care management in nine leading US physician organisations

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Innovations in care management processes have improved the care of patients with chronic illnesses, but many patients still do not receive these benefits. The authors have studied the barriers and facilitators to implementing these improvements in leading US physician practices

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BMJ 2002;325:958-61

About 125 million of the 276 million people living in the United States have some type of chronic illness (table 1).¹ Four chronic conditions affect nearly half of Americans with a chronic disease: asthma, depression, and diabetes each affect about 15 million,²⁻⁴ while five million have congestive heart failure.⁵ In 1999 these four chronic diseases were directly responsible for 140 000 deaths in the United States⁶ and generated at least \$173bn (£108bn, €170bn) in medical and other costs.^{5 7-9}

Over the past decade the effectiveness of care for patients with these and other major chronic illnesses has been improved by innovations in care management processes such as the use of guidelines, disease management techniques, case management, and patient education to improve self management of chronic disease.¹⁰ However, many patients are not benefiting from these advances. Recent studies indicate that fewer than half of US patients with asthma, depression, and diabetes receive appropriate treatment.¹¹⁻¹³ Organisational characteristics of physician practices associated with effective chronic disease care include the use of patient care teams, supportive information systems, and a high volume of patients.¹⁴ Hence, we expect that in the United States moderate and large sized, well organised, multispecialty practices are likely to offer chronic disease care that is as good as it gets and provide other physician organisations with benchmarks against which performance can be measured.

We assessed the extent to which chronic care management processes and computer based clinical information systems were used to care for patients with asthma, congestive heart failure, depression, and diabetes in nine large, multispecialty practices with national reputations for delivering high quality care. We also identified the barriers and facilitators in these organisations that affected their ability to implement care management processes and clinical information systems.

The nine practices studied were the medical groups of the Cleveland Clinic, Group Health Cooperative of Puget Sound, Henry Ford Health System, Intermountain Health Care, Lovelace Clinic, Marshfield Clinic, Mayo Clinic (Rochester, Minnesota Division), Park Nicollet Clinic, and the Permanente Medical Group. The care management processes we examined were practice guidelines (descriptions or statements that guide recommended treatment based on literature and scientific review), population disease management (a care programme that identifies the population of patients with chronic diseases served by the medical group and provides these patients with a symptom

Summary points

Many patients with chronic diseases are not benefiting from effective care management processes

Among leading physician practices in the United States, examples of comprehensive, evidence based chronic care management processes can be found

Among these practices, however, the use of such processes for patients with asthma, congestive heart failure, depression, and diabetes varied greatly

The use of computer based information systems to support the care of patients with chronic diseases could be considerably expanded

The future agenda for improving physician practices should include redesigning work processes to address physicians' concerns about workload, promotion of a culture that supports quality improvement, diffusion of clinical information systems, and financial incentives to reward practices that improve the care and outcomes of patients with chronic disease

management plan, conditioning and drug regimen, education on the disease, and case management by telephone), case management (a programme to intensively manage individual patients with uncontrolled or high cost conditions), and health promotion or disease prevention (an activity occurring outside the clinical encounter that promotes health such as a newsletter containing advice, a series of classes addressing a specific health risk, or screening offered in the community). We also collected information on each medical group's use of seven selected functions of a clinical information system that support chronic disease care management—electronic medical record, electronic recording of health history, recording of tests and procedures, recording of diagnosis and treatment, computerised entry of drug prescriptions, automated reminders, and electronic exchange of information with patients.

These care management processes and clinical information system functions incorporate many of the practices recommended in Wagner's chronic care model, a widely recognised guide to improving chronic

Table 1 Burden of chronic illness in the United States*

Chronic conditions	Mean total medical care costs per year (\$)	Percentage hospitalised annually	Mean No of physician visits per year	Mean No of drugs prescribed per year	Percentage working or in full time education
None (141 million people)	1102	3.4	1.7	2.2	81.2
One (87.8 million people)	4107	7.6	4.6	11.0	74.7
Three or more (22.3 million people)	7195	17.3	9.4	28.3	47.9

*Data from United States Agency for Healthcare Research and Quality. *Medical Expenditure Panel Survey*, 1996 (adapted from figs 2 and 4 in Anderson G, Knickman JR. Changing the chronic care system to meet people's needs. *Health Affairs* 2001;20(6):146-60).

Table 2 Physician organisations in the study

Name	No of primary care physicians	No of specialist physicians	Date of founding	Location of central office
Cleveland Clinic	200	977	1921	Cleveland, OH
Group Health Cooperative of Puget Sound	343	310	1947	Seattle, WA
Henry Ford Health System	250	600	1915	Detroit, MI
Intermountain Health Care	300	100	1975	Salt Lake City, UT
Lovelace Clinic	107	147	1921	Albuquerque, NM
Marshfield Clinic	290	320	1919	Marshfield, WI
Mayo Clinic	154	1339	1921	Rochester, MN
Park Nicollet Clinic	232	253	1951	Minneapolis, MN
The Permanente Medical Group	1570	2449	1948	Oakland, CA

care.¹⁵⁻¹⁸ The chronic care model suggests that effective care requires an appropriately organised delivery system linked with complementary community resources available outside the organisation.

Methods

We selected the sample of leading medical groups (table 2) on the recommendations of the study team members and of the members of the study's national advisory committee. We used qualitative methods to collect and analyse the data.^{19, 20} Members of the research team conducted structured interviews with at least three senior leaders in each organisation—the chief executive officer, the chief medical officer, and the chief information officer. A total of 41 interviews were conducted between May and September 2001. Respondents were assured that none of their comments would be attributed to them personally or to their organisation.

Implementation of care management processes and clinical information systems

Although we found several examples of comprehensive use of care management processes and clinical information systems (see box), some of the medical groups used few, if any, of these care processes. In some cases care management processes were discontinued because of financial and staffing problems. For example, one medical director reported, "In the major downsizing of 1998 the physician running the quality initiatives left and was not replaced. Twelve nurses were laid off. It was bloody." Even when care management processes are maintained, sustaining a high level of effort can be difficult. As one chief executive officer explained, "It's hard work, and one has to keep at it year after year. If you let up, you can lose the gains."

Use of care management processes—Nearly all study groups used clinical practice guidelines for all four chronic conditions (asthma, congestive heart failure, depression, and diabetes). However, the use of the

other care management processes varied greatly across conditions (table 3). Additional analyses not shown here revealed that, for each disease, fewer than half of the nine groups used all four care management processes: three used all four processes for asthma, as did four for congestive heart failure, none for depression, and four for diabetes.

Care management functions performed by clinical information systems—The use of clinical information system functions varied greatly among the medical groups (table 4). One group did not use any of the seven functions, and no group used all seven functions. The eight groups with some clinical information system capability used between four and six of the functions. Six of the nine groups used an electronic medical record; only two had developed electronic information exchange with patients. Two of the clinical information system functions (computerised entry of drug prescriptions and automated reminders) have been shown to improve quality of care in well designed studies.^{21, 22} Only four of the nine practices used computerised

Example of comprehensive care management

In one medical group the doctors have implemented clinical guidelines, disease management, case management, and health promotion and disease prevention for asthmatic patients. There is a registry of asthma patients. Doctors assess whether patients are level one (condition controlled), level two (condition uncontrolled), or level three (condition is complex with multiple diagnoses). The primary care team cares for level one patients. Level two patients are referred to an asthma case manager, who provides intensive care for each patient for about six months with the expectation that the patient's condition will be brought under control. Level three patients are assigned a case manager who is usually a registered nurse, often assisted by a social worker, working in the primary care team. Level one and level two patients are asked to attend educational classes. The organisation also has a website linked to a self care handbook that can be accessed by patients. The registry is used to track patients' progress. In particular the ratio of use of inhaled corticosteroids to use of inhaled corticosteroids plus bronchodilators is periodically assessed. The organisation's information system generates prompts that are placed on the front of charts for asthmatic patients. Physicians receive feedback reports every six months.

Table 3 Number of nine leading physician organisations that have implemented care management processes for selected chronic diseases

Chronic disease	Use of guidelines	Population disease management	Case management	Health promotion or disease prevention
Asthma	9	5	4	7
Congestive heart failure	8	4	8	9
Depression	9	2	1	3
Diabetes	9	9	4	9

Table 4 Information technology functions available to support management of care for patients with chronic diseases implemented by nine physician organisation

Organisation*	Electronic medical records	Electronic exchange with patients	Tests and procedures	Diagnosis and treatment outcomes	Computerised entry of drug prescriptions	Health history	Automated reminder	Total
A	✓		✓	✓		✓		4
B	✓		✓	✓	✓	✓	✓	6
C								0
D		✓	✓	✓		✓	✓	5
E	✓		✓	✓	✓	✓		5
F	✓		✓	✓	✓	✓	✓	6
G		✓	✓	✓			✓	4
H	✓		✓	✓		✓	✓	5
I	✓		✓	✓	✓	✓	✓	6
Total	6	2	8	8	4	7	6	

*Physician organisations are listed in random order and labelled A-I.

entry of drug prescriptions. Automated reminders were used by six of the practices.

Barriers and facilitators to use of care management processes

Why have some of these medical groups implemented a full complement of chronic care management processes whereas others have not? We uncovered important barriers and facilitators to the use of care management processes (table 5). Frequently mentioned barriers were lack of financial and staff resources, inadequate clinical information systems, doctors' heavy workload, compensation not being related to quality of care, and doctors' resistance to change. Doctors' resistance to change and heavy workload are related since overworked doctors fear that change may make things even more difficult. One medical director said, "We have a major problem with overwork in primary care, and it's getting worse. It is impossible to launch any programme that gives physicians more work."

These barriers can be overcome by facilitators, in particular a group culture oriented to quality and supportive managerial and medical leadership. Group culture is often identified as an important factor determining the service orientation of health organisations.²³ Our respondents often noted that at the heart of their group's efforts to provide high quality chronic care is the belief that using care management processes "is the right thing to do." One chief executive officer explained, "We have a culture, a tradition, of partnership between clinician and patient. The patients have high expectations of our organisation, and we feel an impatience to get things improved."

Culture can also be a barrier and can vary with changes in leadership. One medical director reflected, "We did not harness our intellectual capital to support innovations. The focus was on expense reduction. Now

[with new leaders] we have a renaissance of concern about quality; we are having a cultural turnaround."

Facilitators can come from outside as well as inside the organisation. A frequently mentioned facilitator was "support from external organisations such as health plans." A quality oriented culture can be greatly enhanced if health plans reward physician organisations by paying more for high quality.

Building chronic care management capabilities

Some care management processes are easier to achieve than others. The implementation of clinical practice guidelines and health promotion or disease prevention activities for chronic disease is now common among leading physician organisations, and probably feasible for all large group practices. Implementation of population disease management and case management seems to be more difficult. The most common pattern was for the medical groups to implement two or three of the four care management processes, often leaving out population disease management or case management, or both. Surprisingly, there was no relation between the level of sophistication of groups' clinical information systems and their degree of implementation of care management processes. However, the medical groups that were profitable and had a clinical information system, supportive clinical and administrative leadership, a group culture that promoted quality improvement, and incentives from health plans and other external organisations to improve quality were more likely to implement chronic disease care management processes.

If our findings about the barriers and facilitators for use of care management processes are supported by large sample studies of medical practices, the future agenda for restructuring practices should include a redesign of work processes to address doctors' concerns about workload, promotion of a culture that supports quality improvement, diffusion of clinical information systems, and a change in the design of providers' financial incentives.

We thank the many professional associations that formally endorsed the study, including the American Academy of Family Physicians, American Academy of Pediatrics, American College of

Table 5 Five most frequently mentioned barriers and facilitators for implementing chronic care management processes (opinions of a total of 41 chief executive officers, chief medical officers, and chief information officers from nine physician organisations)

	No of mentions*
Barriers	
Lack of financial and staff resources	15
Lack of an adequate clinical information system	14
Doctors are too busy	9
Providers are not paid more for providing high quality care	7
Doctors resist change	7
Facilitators	
Organisational culture supports quality improvement	16
Existing electronic medical record or information system	16
Supportive managerial and medical leadership	16
Support from external organisations such as health plans	9
Organisation's strategic plan	9

*No of respondents who mentioned a particular factor as a barrier or facilitator for implementing care management processes.

Surgeons, American Medical Association, American Medical Group Association, American Society of Internal Medicine, California Association of Physician Organisations, California Medical Association, Illinois State Medical Society, IPA Association of America, Massachusetts Medical Society, Medical Group Management Association, Medical Society of the State of New York, Michigan State Medical Society, Minnesota Medical Association, National IPA Coalition, and Texas Medical Association.

Contributors: TGR, SMS, RRG, JCR, LC, TB, and NO contributed to the conceptual development of the study, study design, data collection and analysis, and writing the manuscript. MCW contributed to the study design, data collection and analysis, and writing the manuscript. JAS contributed to the data collection and analysis. DB, EW, and PG contributed comments and consultation. TGR is guarantor for the study.

Funding: This work was supported by the Robert Wood Johnson Foundation, grant No 038690.

Competing interests: None declared.

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Unwarranted variations in healthcare delivery: implications for academic medical centres

John E Wennberg

Everyday clinical practice is characterised by wide variations that cannot be explained by illness severity or patient preference. Professor Wennberg examines the causes for these variations and suggests ways to remedy the situation

Academic medicine has had only limited success in improving the scientific basis of everyday clinical practice, even within the walls of its own hospitals. Patterns of practice among academic medical centres—as among other institutions—are often idiosyncratic and unscientific, and local medical opinion and local supply of resources are more important than science in determining how medical care is delivered. In short, after nearly 100 years of academic medicine as we know it, much of medicine in the United States remains empirical.

The evaluative clinical sciences—those disciplines whose role in medicine is to evaluate medical theory, understand patient preferences, and improve systems—are capable of improving the scientific basis of clinical practice and warrant high priority in the national research agenda and full adoption into medical school curriculums. These sciences are essential to the development of organised healthcare systems in the 21st century, not least because they expose unwarranted variations in care and can be used to remedy them.

I will begin with a summary of the facts of unwarranted variations in clinical practice, derived

Summary box

Much of clinical medicine remains empirical, and everyday practice is characterised by wide variations that have no basis in clinical science

Patients served by even the best academic centres (teaching hospitals) experience unwarranted variations in health care and health outcomes

The evaluative sciences should be on national research agendas and medical school curriculums

Academic medical centres should start to lobby for this mandate and become advocates for reform

from the Dartmouth Atlas of Health Care project, a US national study of traditional (fee for service) Medicare. The atlas project reports on the rates of use of resources and medical care by residents living in some

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BMJ 2002;325:961-4