

BRIEF REPORTS

Case Management Programs in Primary Care

Jeffrey A. Ferguson, MD, MPH, Morris Weinberger, PhD

To review the impact of case management programs on health care resource use; their impact on patient satisfaction, quality of life, and functional status (patient-centered outcomes); and their cost-effectiveness, we reviewed the English language literature utilizing the following MEDLINE and HealthSTAR headings: case management, patient care planning, patient-centered care, disease management, care management, and managed care programs. Bibliographies of relevant articles were also reviewed. Only randomized controlled trials were included. Data were extracted manually from relevant publications and are presented descriptively because formal, quantitative methods were not applicable. Nine studies met our inclusion criteria. Of the seven studies examining case management's impact on health resource use, only two found a positive effect. Both successful programs targeted patients with specified disease conditions and care was supervised by a medical subspecialist. None of the programs targeting general disease conditions or supervised by generalists reported a positive effect. All six studies examining patient-centered outcomes reported a positive impact. These effects were unrelated to the patient's conditions or the study personnel. Both studies examining clinical parameters found a positive impact. Only three studies examined costs; all reported non-significant cost savings. While case management programs offer theoretical benefits, few examples of successful programs were found. Positive effect was related to disease condition and specialty training of study personnel. Patient-centered outcomes were often improved upon but at unknown cost. Further multisite clinical trials are needed to define case management's role in our future health care system.

KEY WORDS: case management; disease management; care management; patient-centered care; managed care programs. *J GEN INTERN MED* 1998;13:123-126.

The United States health care system is one of the most complex, sophisticated, and expensive industries in the world.¹ Once considered the best health care system in the world, it has increasingly fallen prey to ac-

cusations of limited access to care, excess variation in practice patterns, poorly coordinated care, and uncontrolled costs.¹⁻⁵ In response to these criticisms, health care systems have implemented strategies that seek to deliver health care in a more rational and cost-effective manner (also see Inter Study press release, March 7, 1996).⁶ Notably, the increased number of Americans enrolled in managed care networks represents a strategy designed to reverse or abolish the perverse monetary incentives felt to be responsible for many of the aforementioned inconsistencies in health care delivery. In principle, managed care systems provide positive incentives for disease prevention and for providing comprehensive health care in less expensive venues.

Given these goals of managed care, one such mechanism for providing high-quality, cost-effective health care is to form specialized treatment programs that target high-risk and high-use patients. These programs provide comprehensive management activities including some or all of the following: prevention and detection of acute events through continuous monitoring and assessment; patient education and behavior modification through the use of highly trained multidisciplinary personnel; specialized treatment plans coordinated by disease experts; and preserved continuity of care across diverse patient care settings. Although these are commonly labeled "case management" programs, a lack of common definition among programs and the evolving changes in health care have led to confusion regarding the precise structure and effectiveness of these programs.

Although case management programs offer theoretical advantages of providing better patient care and improved outcomes at a reduced cost, many questions remain unanswered. Do case management programs achieve their theoretical goals? If beneficial, what components of these programs are responsible for their improved outcomes? What is the cost-effectiveness of a successful case management program?

We sought to summarize the literature regarding these unanswered questions by examining the evidence regarding the clinical impact and cost-effectiveness of case management programs. We have focused on studies relevant to readers of the *Journal*, i.e., general internists who provide care to adult populations and treat prevalent medical conditions. For purposes of this article we have operationally defined case management as, "a program that uses physician or nonphysician providers to maintain continuous contact with patients via telephone or in-

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Address correspondence and reprint requests to Dr. Ferguson: Richard L. Roudebush VAMC, HSR&D (11H), 1481 W. 10th St., Indianapolis, IN 46202.

home visits in order to prevent disease exacerbation through intensive assessment and education techniques.”

METHODS

A MEDLINE and HealthSTAR search of the English language literature from 1985 to 1997 was conducted using the following MeSH headings: case management, patient care planning, patient-centered care, disease management, care management, and managed care programs. Only articles reporting results of randomized controlled interventions were allowed. Articles were excluded if they reported results from pre-post or case-control studies; did not contain original data; did not include treatment of adult patients; focused solely on discharge planning or inpatient interventions; or focused on treatment of AIDS,

malignancy, end-stage renal disease, and psychiatric illness. Our search strategy found no articles meeting these prespecified criteria. Because a formal, reproducible computerized literature search was not productive, we identified seminal articles meeting our inclusion criteria and reviewed their bibliographies. Descriptive summaries of study findings are presented because the heterogeneity of study design did not allow for formal quantitative methods to be applied.

RESULTS

Table 1 contains a summary of each study's target population with a brief description of the intervention, sample size, duration of subject follow-up, outcome measures, and intervention effect. Four studies targeted pa-

Table 1. Case Management in Primary Care

Author	Year	Target Group	Intervention	Number of Subjects	Duration of Follow-up	Outcome Measures	Effect (Intervention vs Control)
Mayo et al. ⁷	1990	Asthma	Care provided by 1 specialty MD and nurse; emphasis on patient education and improved access; single site	104	8 mo	Readmission rate Hospital days	0.4/pt vs 1.2/pt, $p < .01$ 3.1/pt vs 6.7/pt, $p < .02$
Rich et al. ⁸	1995	Congestive heart failure	Nurse-directed patient education; dietary instruction by dietician; medication review by specialist; intense outpatient follow-up by team; single site	282	90 d	Mortality Number of readmissions QOL improvement Hospital days Cost	9.2% vs 12.1%; NS 53 vs 94, $p = .02$ 46.1 pts vs 11.3, $p < .01$ 3.9/pt vs 6.2, $p = .04$ \$4,816 vs \$5,275; NS
Weinberger et al. ⁹	1995	Diabetes	Nurse-directed patient education, monitoring of symptoms, and improved access; telephone follow-up; single site	275	1 year	Glycemic control: FBS GlyHgb HRQL (SF-36) Number of symptoms Patient satisfaction	174 vs 193 (mg/dL), $p = .01$ 10.5% vs 11.1%, $p = .05$ 46.9 vs 50.8; NS 1.2/pt vs 1.4/pt; NS 14.1 vs 15.0; $p = .01$
DeBusk et al. ¹⁰	1994	Post-MI	Nurse-managed risk factor reduction as inpatient; telephone follow-up; 5 sites	585	1 year 6 mo	Smoking cessation LDL Functional Capacity	70% vs 53%, $p = .03$ 2.77 vs 3.41 (mmol/L), $p < .01$ 9.3 vs 8.4 (mets), $p < .01$
Smith et al. ¹²	1988	Post-hospital	Nurse-directed needs assessment, medication review, improved access; telephone and primary clinic follow-up; single site	1,001	6 mo	Nonelective admissions Office contacts	0.85/pt/mo vs 0.92; NS 0.53/pt vs 0.48, $p < .01$
Fitzgerald et al. ¹³	1994	Post-hospital	Nurse-directed education, telephone and primary clinic follow-up, improved access; single site	668	12 mo	Clinic visits Nonelective admissions ER visits Mortality	.99/pt/mo vs 1.04; NS .064/pt/mo vs .065; NS .18/pt/mo vs .19; NS 10.5% vs 10.4; NS
Cummings et al. ¹⁵	1990	Post-hospital	VA HBHC, multidisciplinary team (MD, nursing, dietary, social work and physical therapy), home visits and continuity care; single site	419	6 mo	Hospital days Functional status Satisfaction Cost	12/pt vs 14; NS Multiple scales Multiple scales \$4,648 vs \$5,320; NS
Weinberger et al. ¹⁴	1996	Post-hospital (CHF, COPD, diabetes)	Nurse/primary MD team, telephone follow-up, improved access; 9 sites	1,396	6 mo	Readmission rates QOL Satisfaction	.19/pt/mo vs .14, $p < .01$ Multiple scales Multiple scales
Toseland et al. ¹¹	1996	Geriatric patients	Nurse and geriatrician directed care which included both outpatient and inpatient settings; single site	160	8 mo	Functional status Well being Hospital rate Hospital days Cost	Multiple scales Multiple scales .64 vs .60; NS 8.75 vs 7.2; NS \$7,300 vs \$5,900; NS

tients with a specified condition, e.g., asthma, congestive heart failure, diabetes mellitus, or coronary artery disease,⁷⁻¹⁰ while five studies targeted patients with heterogeneous conditions, e.g., posthospitalization or geriatric populations.¹¹⁻¹⁵ Three interventions were supervised by a medical subspecialist,^{7,8,11} and six by generalists.^{9,10,12-15} Two studies were carried out at multiple sites,^{9,10} while seven were conducted at single sites.^{7,8,11-15} Study sample sizes had a range of 160 to 1,400 subjects, and patient follow-up ranged from 3 months to 1 year.

Of the seven studies examining the impact of case management programs on hospitalizations and hospital days,^{7,8,11-15} only two reported statistically significant reductions in health care utilization^{7,8}; the others found nonsignificant changes,^{11-13,15} or increased utilization.¹⁴ Three of these studies also reported the impact of case management on health care costs, and none revealed statistically significant cost savings.^{8,11,15} Two studies examined case management's impact on clinical parameters only, both reporting positive findings.^{9,10} Overall, six studies examined outcomes related to patient satisfaction, quality of life, or functional status, and all reported improved outcomes.^{8-11,14,15}

In single-site studies, both interventions targeting specified conditions and supervised by a medical subspecialist reported a positive impact on health care utilization.^{7,8} However, only one of these examined health care costs, and this study revealed nonsignificant cost savings.⁸ None of the interventions targeting heterogeneous populations,¹¹⁻¹⁵ or supervised by primary care physicians,¹²⁻¹⁵ were successful in reducing health care resource use, and, of the two that measured costs, both found nonsignificant cost savings.^{11,15} The interventions generally improved patient satisfaction with care, and this improvement was not related to the patient's target conditions or the specialty of the supervising physicians.

DISCUSSION

Implementation of novel, cost-effective approaches to patient care is at the forefront of health care decision making and will continue to be in the foreseeable future. Health care chief executives, business managers, clinical directors, and physicians are all faced with making difficult decisions regarding optimal health care programs for their patients.

Although case management programs offer distinct theoretical advantages over traditional methods of health care delivery, we were able to find few examples of successful controlled trials implementing these programs. Plausible reasons for our inability to substantiate the theoretical benefits are poor uniformity and rapidly evolving terminology thus rendering formal literature searching futile, lack of published positive results by proprietary agencies who wish to use their technologies and interventions exclusively for their gain, or lack of rigorous study in this field. Other researchers have faced similar challenges in

summarizing the case management literature: "Evaluations of experience with case management are difficult because case management is not as clearly defined as published reports sometimes suggest. At least it is not defined in a way that would allow it to be used unambiguously as an independent or intervening variable in research to test its efficiency, effectiveness and efficacy."¹⁶

Although we found many additional articles regarding case management, we chose, a priori, not to report results from pre-post or case-control studies. Given the rapidly evolving nature of health care delivery, we felt that studies lacking a true control group did not permit us to make valid inferences regarding the cause-effect relationship of these case management programs and their reported outcomes.¹⁷⁻²² Rather, the positive findings in many of these studies should identify strategies that can be formally evaluated in future randomized controlled trials.

Given these limitations, were we able to address any of the unanswered questions regarding case management programs? First, the randomized controlled trials that we identified generally had a nonsignificant impact on health resource use. Interventions targeting general populations or supervised by generalists were not effective. The two single-site studies finding a positive effect targeted patients with specified conditions and were supervised by highly trained specialists.^{7,8} However, only one of these measured cost of the intervention and found a nonsignificant cost savings.⁸ Moreover, the study revealing the most dramatic benefit targeted a highly select population of patients with congestive heart failure. The authors of this study state, "only 21.6% [of available patients] were eligible to be randomized. The applicability of our findings to other patients with heart failure requires further study."⁸ Thus, our best evidence for the success of a case management program is, in fact, an efficacy study that requires further validation. We do not know if implementation of this program in different settings by different providers would yield similarly favorable results.

Second, these interventions had a generally positive impact on patient satisfaction, quality of life, and functional status. Thus, while many of these programs did not reduce health care resource use, intervention patients were happier with their care and perceived an improvement in outcomes that were important to them. These improvements were observed in all types of programs regardless of patient or intervention characteristics. For health care organizations competing for patient enrollment, these outcomes are important issues to consider because enrollees are more likely to remain loyal to systems in which they are satisfied. Finally, we are unable to comment on the cost implications of these programs because so few of them reported results of cost analyses.

In summary, the existing literature on case management does not provide a solid endorsement of these programs' impact on health care resource use. Patient satisfaction, quality of life, and functional status improved with these programs but at an unknown cost. Results

from ongoing multisite trials are needed to better define the role of case management in our future health care system.

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