

Reducing emergency department visits among high-using patients

William R. Brandon, MD, MPH, and Richard Chambers, MSPH

Department of Family Practice, Ochsner Clinic Foundation, New Orleans, La

Practice recommendations

- Intervention using a real-time database system was accepted by physicians and reduced high-cost encounters.
- The risk of a high-cost encounter was significantly greater for the minimal intervention than for the moderate or maximal intervention groups.
- The probability of an emergency department visit was significantly reduced for minimal compared with moderate and maximal intervention. The risk for emergency department events was the same for the moderate and maximal intervention groups.
- Moderate intervention seems the most cost-effective because of reductions achieved with minimal staff involvement.

Corresponding author: William R. Brandon, MD, MPH, Ochsner Clinic Foundation, New Orleans East, 5701 Deer Park Boulevard, New Orleans, LA 70127. E-mail: WBrandonMD@aol.com.

With escalating health care costs, primary care physicians need a simple way to monitor and modify the high-using behavior of their managed care patients. Several studies have shown that <20% of a primary care physician's patient load will use 90% of the expended resources each year.¹ Although many of these expenditures may be unavoidable due to acute injury or illness, many of these high-users are patients with chronic illnesses.

Most efforts to contain costs have focused on developing clinical care protocols for expensive illnesses (ie, coronary heart failure, diabetes)² to reduce the need for inpatient management. Also, health maintenance organizations (HMOs) have developed incentive plans for physicians who hold down costs by reducing use of high-cost services.³ Several studies have shown that when real-time databases are used and available for feedback to physicians, quality improves and cost is contained.^{4,5}

Other than descriptions of disease-focused case management, there is little information in the literature on methods primary care physicians can use themselves to monitor patients' use patterns. Our recent study showed that physicians

TABLE 1

Physician and patient demographics	
Physicians	n=16
Discipline	
Family medicine	n=8
Internal medicine	n=8
Average time in practice	12 years
Average time at current site	8.3 years
Practice type	
Ambulatory only	n=8
Ambulatory and inpatient	n=8
Patients	n=1600
M/F (%)	37%/63%
Average age	62 years
Average time enrolled in health plan	7.2 years

are often unaware of the activity of some of their highest-using patients and miss the opportunity to intervene.⁶

We conducted a randomized prospective trial comparing 3 different interventions that primary care physicians can use to monitor and modify their patients' resource use patterns. The goal of this study was to find a relatively simple method that would be accepted by primary care physicians to lower high-cost encounters among their highest users of medical services.

■ METHODS

Study sample

Sixteen primary care physicians—employed at least 5 years at 4 different satellite clinics of a large multispecialty clinic—were randomly divided into a 4-member control group and three

4-member intervention groups. Two-year retrospective financial data of each physician's patient load were analyzed to determine which patients had been among the top 10% in resource use each of the last 2 years.

From the resulting group of 3200 patients, 100 patients of each primary care physician were chosen randomly to be followed for 1 year, along with their primary care physician in the 4-member groups. All 1600 cases were available for analysis, maintaining health plan enrollment throughout the study period. Fourteen patients died during the study period. Health plan financial data and clinic visit data were used. **Table 1** shows physician and patient demographics.

Study design

Patients' health care use for the study period was tracked through the information system of the multispecialty clinic. It was confirmed by reviewing charge data from the patients' HMO billing record.

Data were analyzed on a quarterly basis, and then compiled for an annual figure at the end of the study. At the end of the study, all physicians in the 3 intervention groups (n=12) were surveyed about their acceptance of incorporating moderate or maximal intervention into their clinical practice. This study was approved by the Institutional Review Board.

The control group was unaware of the study and had no contact with study personnel until the study was completed. The 3 intervention groups were divided into minimal, moderate, and maximal intervention.

Minimal intervention. Primary care physicians received a list of 100 of their patients designated as high users with identifying information. General suggestions were given to primary care physicians on how they could monitor/modify high users' behavior: make regular appointments, have the nurse call for follow-up after an emergency department visit or hospital admission.

TABLE 2

Odds ratio of high-cost encounter* for each intervention group

Comparison	High-cost encounters (patient-months)		Emergency department use		Inpatient admissions	
	OR	95% CI	OR	95% CI	OR	95% CI
Control vs minimal	1.32	(1.20–1.60)	1.32	(1.20–1.60)	1.60	(1.42–2.43)
Control vs moderate	1.83	(1.56–2.14)	2.46	(1.80–3.38)	2.64	(1.92–3.64)
Control vs maximal	2.31	(1.95–2.73)	2.91	(2.12–4.01)	4.37	(3.15–6.06)
Minimal vs moderate	1.39	(1.19–1.61)	1.85	(1.39–2.46)	1.64	(1.24–2.17)
Minimal vs maximum	1.75	(1.49–2.00)	2.19	(1.64–2.92)	2.71	(2.02–3.62)
Moderate vs maximum	1.26	(1.06–1.50)	1.18 [†]	(0.88–1.59)	1.65	(1.23–2.21)

*High-cost encounter defined as emergency department visit or inpatient admission.
[†]Nonsignificant.
OR, odds ratio; CI, confidence interval

Moderate intervention. Primary care physicians received the initial list and quarterly updates of patients on their lists who had an emergency department visit or inpatient admission or did not follow-up with them in the clinic within 2 weeks of the high-cost encounter.

Maximal intervention. Intervention in the maximal group was the same as for moderate intervention, except that patients who did not make a follow-up visit within 2 weeks were contacted by a case manager to determine barriers to access and to facilitate a follow-up visit with the primary care physician. Where appropriate, a follow-up visit was made with the primary care physician by the case manager.

Outcome measures

Emergency department visits and inpatient admissions were designated as high-cost encounters because of their potential for high use, accounting for a significant portion of non-surgical cost for HMO members, and a high likelihood of lack of follow-up after the encounter. Review of HMO financial data revealed these to

be members' highest (nonsurgical) costs. A calculated variable: A high-cost encounter was calculated by determining a binary outcome variable derived by aggregating emergency department and inpatient visits.

Data analysis

The study groups were compared by logistic regression. The 95% confidence intervals (CIs) accompanying the odds ratios (ORs) are the tests of significance. If the range of the CI includes the value 1, the difference between groups being compared is not statistically significant ($\alpha=.05$).

RESULTS

Table 2 shows the OR of a high-cost encounter (emergency department visit or inpatient admission) for each intervention group. The unit of measure for this table is patient-months.^{7,8} All ORs are read from left to right. For example, the minimal intervention group is 2.19 times more likely to have an emergency department event than maximal group.

The moderate intervention seems to be the most cost-effective due to reductions in staff involvement

The risk of a high-cost encounter was significantly greater for the minimal intervention than for the moderate or maximal intervention groups. The moderate group had a statistically significant greater risk of a high-cost encounter than the maximal intervention group, but the observed magnitude of the risk was small and the lower limit of the CI is very close to 1. The clinical importance of this finding may be questioned in light of the cost effectiveness of the maximal intervention.

The probability of an emergency department visit was significantly reduced for minimal compared with moderate and maximal intervention. The risk for emergency department events was the same for the moderate and maximal intervention groups.

The minimal group was more likely to have an admission than both the moderate and maximal intervention groups. The maximal group was also less likely to have an admission than the moderate intervention group. The moderate intervention appears to be the most cost-effective because of reductions achieved with minimal staff involvement.

Physician acceptance

All physicians in the 3 intervention groups were surveyed after study completion. Ninety percent agreed with the statement "I will use the moderate intervention now that it is shown to reduce utilization."

Maximal intervention was thought to be less useful because many patients contacted were under the care of specialists and had no intention of returning to the primary care physician for care. Most of these patients did not require the use of the care manager, so the primary care physicians considered this extra expense as unnecessary.

DISCUSSION

Our results appear to support the contention that primary care physicians can use relatively simple methods to monitor and modify the high-use behavior of members of their managed care panels. By designating frequent users of medical services as "high risk" for future utilization, primary care physicians can track these patients in a proactive fashion using a real-time database system.

At least in this relatively large, vertically integrated, multispecialty health system, emergency department and inpatient admissions were significantly reduced using the database. The moderate intervention appeared to be relatively well accepted by the primary care physicians and able to be instituted within their practice without much difficulty.

If adopted by larger health care systems, this method should result in considerable savings. Other studies in different health care settings are needed before this method can be recommended on a wider basis.

REFERENCES

- Halpert AP, Pearson SD, LeWine HE, Mckean SC. The impact of an inpatient physician program on quality, utilization, and satisfaction. *Am J Manag Care* 2000; 6:549-555.
- Wolff M, Bower DJ, Marbella AM, Casanova JE. US family physicians' experiences with practice guidelines. *Fam Med* 1998; 30:117-121.
- Zierler BK, Marcus-Smith MS, Cheadle A, et al. Effect of compensation method on the behavior of primary care physicians in managed care organizations: evidence from interviews with physicians and medical leaders in Washington State. *Am J Manag Care* 1998; 4:209-220.
- Realtime data, aggressive intervention slash diabetes costs and increase satisfaction. *Data Strateg Benchmarks* 1998; 2:71-74.
- Ignagni K. Health plans will use new tools to help physicians practice better. *Manag Care* 1999; 8:27-28, 31.
- Brandon WR, Chambers R. The validity and usage of resource utilization data among a group of primary care physicians. *Am J Manag Care* 1997; 3:1369-1376.
- Rothman KJ, Greenland S, eds. *Measures of Disease Frequency Modern Epidemiology*. 2nd ed. Philadelphia, Pa: Lippincott, Williams & Wilkins, 1998.
- Sergeant PT, Blackstone EH. Closing the loop: optimizing physicians' operational and strategic behavior. *Ann Thorac Surg* 1999; 68:362-366.