

Administration of Emergency Medicine



COST-EFFECTIVE: EMERGENCY DEPARTMENT CARE COORDINATION WITH A REGIONAL HOSPITAL INFORMATION SYSTEM

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Abstract—Background: Frequent and unnecessary utilization of the emergency department (ED) is often a sign of serious latent patient issues, and the associated costs are shared by many. Helping these patients get the care they need in the appropriate setting is difficult given their complexity, and their tendency to visit multiple EDs. **Study Objective:** We analyzed the cost-effectiveness of a multidisciplinary ED-care-coordination program with a regional hospital information system capable of sharing patients' individualized care plans with cooperating EDs. **Methods:** ED visits, treatment costs, cost per visit, and net income were assessed pre- and postenrollment in the program using nonparametric bootstrapping techniques. Individuals were categorized as *frequent* (3–11 ED visits in the 365 days preceding enrollment) or *extreme* (≥ 12 ED visits) users. Regression to the mean was tested using an adjusted measure of change. **Results:** Both *frequent* and *extreme* users experienced significant decreases in ED visits (5 and 15, respectively; 95% confidence intervals [CI] 2–5 and 13–17, respectively) and direct-treatment costs (\$1285; 95% CI \$492–\$2364 and \$6091; 95% CI \$4298–\$8998, respectively), leading to significant hospital cost savings and increased net income (\$431; 95% CI \$112–\$878 and \$1925; 95% CI \$1093–\$3159, respectively). The results further indicate that fewer resources were utilized per visit. **Conclusions:** When examined as a whole, research on the program suggests that expanding it would be an efficient allocation of hospital, and possibly societal, resources. © 2014 Elsevier Inc.

Keywords—emergency department; frequent users; care coordination; cost-effectiveness; information exchange

INTRODUCTION

Frequent improper use of the emergency department (ED) is a concern for hospitals and their patients, ED providers, third-party payers, and society. Studies have found that a small percentage of ED patients constitute a large proportion of total ED visits (1–4). It is not always clear what drives frequent ED use; however, it is likely a sign of serious latent issues (5). Some studies indicate that frequent use may be a function of patients lacking access to a primary care provider (PCP), whereas others have found evidence to the contrary (3,6–12). Frequent ED users tend to be a complex low-income population in poor physical health, with many suffering from mental illness or substance-use disorders (1,3,13–17). Resources consumed by this group are vast, and concomitant with an increased frequency of ED visits is ED crowding, wait times, strain on staff, and adverse outcomes (15,18–28). Therefore, helping these patients get the care they need in the appropriate setting is crucial.

A systematic review of the Emergency Medicine literature revealed substantial variability in the proportion of ED visits deemed to be nonemergent, with a median

finding of approximately 32% (29). Weinick et al. found that roughly 14–27% of all ED visits could be treated in clinics and urgent-care centers at a lower cost; a potential savings of \$4.4 billion per year (30). On a related note, a Washington State Hospital Association report found that half of all potentially avoidable ED visits were made by publicly insured individuals (31). Similarly, Zuckerman and Shen found that 18% of the patients in their sample with three or more ED visits in the prior year were uninsured and 29% were publicly insured, the latter group being over twice as likely to be frequent users as those who were either privately insured or uninsured (32).

Findings such as these have prompted policymakers to explore options for reducing expenditures on nonurgent visits to the ED. For example, the Washington State Health Care Authority (HCA) proposed a policy to deny reimbursement for ED visits made by Medicaid beneficiaries that are deemed to be “not medically necessary in the ED setting” (33). Several factors, including concern that this policy was not in the best interest of Medicaid recipients, resulted in its suspension by the Washington State legislature (34). Instead, the state implemented a policy allowing hospitals to apply seven *best practices* for reducing nonemergent ED visits; however, the HCA reserves the right to revert to the policy of denying payment if an adequate reduction in ED expenditures is not achieved.

Given the aforementioned complexity of frequent ED users, reducing inappropriate ED use and ensuring that needed care is received in the appropriate setting may be more difficult than simply triaging these patients and providing them with information on where such care can be received. Especially given that frequent users often visit multiple EDs (35–38). Therefore, multidisciplinary ED-care-coordination programs have received attention as a means to treat frequent users efficiently. The structure of such programs varies, but the majority involves a case manager who represents the care-coordination team and directs the patient through the care process; a format that has been effective at reducing ED visits (39). Programs that develop formal ED-care plans are less common, but also effective (40). Still, many studies assessing the effectiveness of such programs have failed to include a cost analysis. Cost-effectiveness is something that should be considered by health care facilities and policymakers interested in efficiently allocating scarce resources.

The objective of this article was to preliminarily assess the cost-effectiveness of a relatively unique multidisciplinary ED-care-coordination program. This program is unique in that not only are individualized ED-care guidelines created for each patient, but also at its core is a regional hospital information system that allows participating EDs to view the guidelines. This is important, as

the guidelines inform the emergency physician on proper care in the ED while directing the patient to further care in the appropriate setting. Such a program has the potential to benefit patients, all EDs in a given area, and in turn, society as a whole. As a result, this type of electronic patient-information-exchange system is receiving considerable attention in Washington State. In fact, the first *best practice* requires EDs to exchange patient information in real time using a similar system (41).

Additional contributions to the literature include subgroup analyses according to the frequency of ED visits made over the year prior to initiation into the ED-care-coordination program, and focusing not only on changes in visits and direct-treatment costs as others have done, but also on changes in the hospital’s net income and the direct cost of treatment per ED visit. Analyzing cost per visit allowed us to determine whether changes in cost were concomitant with changes in trips to the ED, or if the program also affected the resources used during a given ED visit. Separate analyses of relatively low and high frequent users gives stakeholders a sense of whether the program is cost-effective for all patients fitting the description of an over-user, or if resources should be focused on a subset of this population.

METHODS

Study Design

This was a 2-year retrospective pre-post analysis on a convenience sample of patients enrolled in a multidisciplinary ED-care-coordination program. Enrollment was based on referrals from ED physicians and Medicaid managed care plans. Prior to enrollment, patients’ ED visits were retrospectively reviewed by a nurse case manager and a multi-disciplinary committee who determined that the patient demonstrated a pattern of inappropriate ED visits that could benefit from ED care coordination. Preference was given to managed-care Medicaid patients whose health plan provided reimbursement to the program. Data were collected on each subject for the 365 days prior to their initiation date for the program, and the 365 days after. The study was reviewed and approved by the Institutional Review Board (IRB) Spokane in Spokane, Washington (an IRB overseeing research done at the major Spokane-area medical facilities), and the Washington State University IRB.

Study Setting

The setting for this study was the Consistent Care (CC) program based at Providence Sacred Heart Medical Center & Children’s Hospital (SHMC) in Spokane. SHMC is a regional medical and trauma center for the

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