

Impact of Mailing Information About Nonurgent Care on Emergency Department Visits by Medicaid Beneficiaries Enrolled in Managed Care

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Abstract

Context: Emergency department services may be used more appropriately if laypeople's knowledge of managing minor medical problems could be enhanced, especially since Medicaid applies a "prudent layperson" standard for providing access to emergency care.

Objective: To investigate the effect of mailing a booklet, *First Look*, that informed Medicaid beneficiaries about care of common nonurgent conditions and encouraged use of alternatives to emergency care including care by office-based physicians, telephonic nursing assistance, and self-care.

Study Design: A randomized, parallel group study.

Patients and Methods: Administrative data from 2 health plans serving urban Medicaid populations were used to identify households with a history of emergency department utilization (n = 3101 and n = 3822). Within each health plan, households were randomly assigned to receive *First Look*. The number of emergency department visits during 6.5 months of follow-up was the primary study endpoint.

Results: Compared with controls, 1% fewer members of households that were mailed *First Look* visited an emergency department in each health plan

(23% versus 24% in Plan A; 27% versus 28% in Plan B). The 95% confidence intervals on the observed differences were -3% to 1% and -4% to 1% in Plans A and B, respectively. The proportion of emergency department visits for conditions discussed in *First Look* was not significantly reduced in households that were mailed the booklet (62% versus 60% in Plan A and 51% versus 48% in Plan B).

Conclusion: Mailing *First Look* to Medicaid beneficiaries did not have a significant effect on use of emergency departments. Medicaid programs need to evaluate other, perhaps more multifaceted, interventions to promote appropriate use of emergency departments.

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The use of emergency department services for nonurgent care is a national phenomenon.¹ An analysis of the 1987 National Medical Expenditure Survey estimated that 40% of emergency department visits were not urgent.² Emergency department visits for nonurgent care were 2 to 3 times more costly than visits to office-based physicians and may have reduced the continuity of care and scope of medical services if emergency care was substituted for primary care. Medicaid programs have had high rates of emergency department use.³ In UnitedHealthcare plans in 1998, the use of emergency departments by Medicaid beneficiaries was more than 4 times higher than that by commercial populations (unpublished data).

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One reason for nonurgent use of emergency departments by Medicaid beneficiaries is limited access to office-based physicians. In one nationwide investigation, attempts by investigators acting as Medicaid beneficiaries to make appointments with physicians within 2 days for conditions such as back pain, dysuria, and sore throat were successful only 35% of the time.⁴ States have enrolled Medicaid beneficiaries into managed care programs in an effort to improve access to primary care physicians and control expenditures. In New York City, Medicaid beneficiaries who were enrolled in managed care organizations reported greater access to office-based doctors, but overall emergency department use did not decline among managed care enrollees.⁵ With Maryland's Access to Care Program, which helped Medicaid recipients find a primary care provider and asked primary care physicians to authorize emergency care, the number of visits to physicians increased, but use of emergency departments did not decline.^{6,7} In another study, Medicaid recipients who used an emergency department were encouraged to visit a primary care provider and an effort was made to reduce barriers such as transportation and limited office hours; these measures reduced nonurgent pediatric emergency department visits only temporarily.⁸ These studies therefore suggest that improved access to office-based physicians alone may not be sufficient to reduce emergency department use among Medicaid beneficiaries.

The Medicaid standard for providing emergency department services is based on the perspective of a prudent layperson. Information that enhances a layperson's knowledge and confidence in managing minor medical problems might reduce demand for care of less urgent illnesses.⁹⁻¹¹ One study has indicated that parents often seek advice from others before seeking emergency care; seeking advice, particularly from an individual with a medical background, increased the percentage of appropriate emergency room visits.¹² Written information may serve as a surrogate or supplement to an advisor. Emergency department use was reduced when distribution of educational materials to Medicaid beneficiaries was combined with a 24-hour telephone triage service staffed by nurses.¹³ The content of the educational materials and actual use of triage nurses, however, were not described, groups were not randomly assigned to receive the demand management program, and control of influential extraneous variables during data analysis was not clearly established. In another study, providing information about appropriate use of primary care providers and

care of minor illnesses did not reduce emergency department use.¹⁴ In this study, 130 families that visited a single pediatric emergency department for care of minor illnesses were randomly assigned to an intervention or control group. The intervention included a videotape and a booklet and was provided by emergency room staff in the emergency department. A nurse who answered parents' questions read them the booklet, which included topics such as the role of primary care physicians and management of illnesses such as asthma, cold, diarrhea, and chicken pox. Because of the varying interventions and inconsistent results among the few published studies, additional research on the effectiveness of providing information to improve the use of emergency departments is clearly needed.

This report presents results from a randomized, controlled, parallel group study of the impact of mailing information to Medicaid beneficiaries enrolled in 2 health plans. The information was provided in a booklet that described self-care, 24-hour telephone access to nurse expertise, and use of office-based physicians for nonurgent conditions. The working hypothesis was that mailing the booklet of information to Medicaid beneficiaries would decrease emergency department visits through increased self-care and use of office-based physicians.

...METHODS...

Intervention

UnitedHealth Group and the Channing L. Bete Company developed the *First Look* booklet as a guide to use of medical services and self-care for minor conditions. *First Look* was 44 pages long and was written at a fourth-grade level. The initial pages encouraged health plan members to choose a personal doctor, offered customer service numbers to assist in finding a personal doctor, provided guidance on when to use emergency services, and advised members to call their personal doctor in nonemergency situations. Several common illnesses were discussed in terms of symptoms, home care, and when to call a doctor. Conditions addressed included colds, flu, coughs, diarrhea, earaches, fever, headaches, nausea, vomiting, sore throat, bites, stings, bruises, cuts, scrapes, burns, sprains, strains, asthma, common childhood viral illnesses such as chicken pox, discomforts associated with pregnancy such as heartburn, female urinary tract infections, and vaginitis. In addition, a toll-free 24-hour telephone number for an assistance service

staffed by nurses was prominently displayed throughout the pamphlet. Messages to establish a relationship with a personal doctor and avoid use of emergency services for minor problems were reiterated on the final pages. The last page provided a quick reference guide for self-care and prominently displayed the number of the nurse assistance service. A focus group consisting of low-income members of diverse ethnicity indicated that *First Look* was easy to read and contained useful information.

Study Groups and Design

Two UnitedHealthcare health plans participated in evaluating the benefit of mailing *First Look* to Medicaid beneficiaries. Plans A and B served predominantly urban populations of approximately 30,000 and 39,000 Medicaid beneficiaries who were almost entirely ($\geq 98\%$) in Aid for Families with Dependent Children programs. Enrollment records and facility claims were electronically searched to identify members who (1) were enrolled in the health plan under Medicaid Aid for Families with Dependent Children for at least 5 of the 6 months from May 1997 to November 1997 and (2) had at least one emergency department visit during the 6-month selection period. These selection criteria were used to identify members who had a history of using emergency department services (regardless of urgency) and a stable period of enrollment. Heads of household were identified for each selected member to create the sampling frames of 3101 and 3822 households in Plans A and B, respectively. Heads of household were assigned randomly and in equal numbers to either the intervention group that was sent *First Look* or the control group. The sampling frame for Plan B mistakenly listed about 5% of households under more than one head of household. Households that were assigned to both study groups because of this duplication were assigned to the intervention group for analysis because the household was sent *First Look*. Thus, the eventual number of control and intervention households was different in Plan B.

Study cohorts were identified by electronic review of enrollment files and facility claims in November 1997 for the May 1997 to November 1997 baseline period. However, *First Look* was not mailed to selected members until January 16, 1998, and hence, the baseline period was extended from 6 to 8.6 months. Return postage was guaranteed. The primary language of selected households was not known; however, a postcard requesting a Spanish version of *First Look* was also sent to each household because Spanish was assumed to be the most

common non-English language used by the Medicaid populations in the 2 health plans.

The follow-up period for the study was from January 17, 1998, to July 31, 1998. The 6.5 month follow-up period was chosen in order to provide timely results to health plan management. Claims were extracted in August and September 1998. Claim lags were ignored on the presumption that late entries would account for a similar proportion of claims (study events) in both the intervention and control groups. In Plans A and B, 72% and 94%, respectively, of the Medicaid claims that were used to identify emergency department visits during the baseline and follow-up periods were in the administrative database within 2 months of the date of service.

Statistical Analysis

Calculation of Sample Size. The proportion of households that used an emergency department during a 6-month period was used to estimate the minimum desired sample size. Since this proportion was not known for households with a recent history of emergency department use, a control group value of 50% was used because the variance of a percentage (and hence that of the sample size) is maximal at 50%. The level of detection was set at a 5% reduction in household emergency department use. The sample size required to estimate a difference of 5% with a 95% confidence interval (CI) of $\pm 5\%$ was 765 households in each group. All households that met the inclusion criteria were included in order to increase the precision of the CIs. In addition, CIs were calculated for the difference in the percentage of members within a household who visited an emergency department. Because of multiple members per household, it was anticipated that the increase in sample size gained by analyzing members rather than households would increase the precision of the CI if use of emergency departments by different members within households was not highly correlated.¹⁵

Outcomes. The primary endpoint was emergency department visits, which was compared between the intervention and control groups within each health plan by using the household as the unit of analysis. Data from the 2 study health plans were analyzed separately because of potential differences in population characteristics and different claims-processing systems (claims-based algorithms that defined study events and claim lags were not strictly comparable across the 2 health plans).

The percentages of households that had at least one member who visited an emergency department

were compared with a chi-square test. Since the distribution of household size was similar in the groups being compared, this was an informative comparison. Many members were children cared for by a head of household who may have had a propensity to either use or not use an emergency department, which could influence other household members. The average proportion of household members with at least one visit was also weighted by household size to take into account the potential relationship between visits by members of the same household.¹⁵ The results of this analysis were similar to simple estimates of the proportion of members who visited an emergency department.

A secondary endpoint was the percentage of members who visited office-based physicians; these data were analyzed in the same manner as emergency department visits.

The primary diagnosis listed on facility claims for an emergency department visit was extracted, and the proportions of all emergency department visits

that were related to conditions discussed in *First Look* were compared for each health plan using a simple chi-square test. Emergency department visits followed by claims for inpatient care on the same or the next day were identified for a secondary analysis that excluded emergency visits associated with a hospital admission.

... RESULTS ...

Baseline Characteristics of the Study Groups

Baseline characteristics of the study populations are shown in Table 1. The study households had 10,371 members in Plan A (34% of Plan A's Medicaid membership) and 8521 members in Plan B (20% of Medicaid membership). Within each health plan, the household size, age, and gender of the intervention and control populations were comparable. Approximately one third of the study members were adults. Within each health plan, the percentages of members in the intervention and control groups who had visited an emergency department or physician's office during the 8.6-month baseline period were nearly identical. The average duration of follow-up for the intervention and control groups in Plan A (5.5 and 5.6 months, respectively) and Plan B (6.0 and 6.1 months, respectively) were similar.

Emergency Department and Physician Office Visits

Emergency department and physician office visits during the follow-up period are summarized in Table 2. In Plan A, a smaller percentage of intervention households used emergency medical services, compared with the control group (52% versus 55%; $P=.05$). In Plan B, the percentages of

Table 1. Baseline Comparison of Study Groups

	Plan A		Plan B	
	Control	Intervention	Control	Intervention
Number of households	1550	1551	1794	2028
Mean (SD) household size	3.4 (1.4)	3.3 (1.4)	2.1 (1.5)	2.3 (1.7)
Number of members	5260	5111	3810	4711
Female members (%)	62	63	64	63
Mean (SD) age (yrs)	14 (12)	14 (12)	14 (12)	14 (12)
Breakdown by age (%)				
<7 years	37	38	33	34
7-12 years	20	19	23	23
13-18 years	11	10	14	16
>18 years	32	33	30	27
Emergency department visits (% of members)				
0	59	60	42	40
1	25	26	37	38
>1	16	14	21	22
Physician office visits (% of members)				
0	38	38	39	39
1	20	20	21	21
>1	42	42	40	40

SD = standard deviation.

households that used emergency medical services were similar for both groups. In Plan A, the percentage of household members in the intervention group who visited an emergency department differed from the control group by -1.1% (95% CI: -3.1% to 0.8%). The difference in Plan B was -1.2% (95% CI: -4.1% to 1.4%).

In the subgroup of members who visited an emergency department during follow-up, 74% made 1 visit, 18% made 2 visits, and 8% made more than 2 visits in the intervention group in Plan A. These percentages were not significantly different from the control group percentages of 71%, 19%, and 10%, respectively. Similarly, in Plan B, the number of visits per member did not differ between the 2 groups, with the percentages of members with 1, 2, and more than 2 visits being 66%, 22%, and 12%, respectively, in the intervention group and 68%, 21%, and 11%, respectively, in the control group.

Only 9 members in Plan A (0.6%) and 7 in Plan B (0.3%) returned the postcard written in Spanish to request a Spanish translation of *First Look*. Although the Spanish translation may not have been equivalent to the English version, the number of identified Spanish-speaking members in this study was too small for a separate analysis. The results were not altered by exclusion of 12.7% of members in Plan A and 8.5% of members in Plan B households who either returned *First Look* to sender or requested a Spanish translation (data not shown).

Neither health plan differed significantly in the percentage of intervention households or household members who visited an office-based physician. An analysis of the database of calls to the nurse-staffed help number identified only 7 members from Plan A who used the nurse line during the study period. Call records could not be matched to study group members in Plan B.

The possibility of a differential effect of the study intervention on emergency department visits by children (younger than 19 years)

and adults was explored. The percentages of child members who visited an emergency department during the follow-up period were identical in the intervention and control groups in Plan A (20% and 20%, respectively; 95% CI for the difference: -2.1% to 2.5%) and Plan B (24% and 24%, respectively; 95% CI for the difference: -2.7% to 2.6%). Adults were more likely to visit an emergency department than children, and there was a statistically insignificant trend for a reduced likelihood of emergency department use among adults in the intervention groups. In Plan A, the likelihood of an adult member visiting an emergency department was 29% in the intervention group compared with 32% in the control group (95% CI for the difference: -5.3% to 1.1%). In Plan B, the likelihood was 34% for the intervention group, compared with 37% for the control group (95% CI for the difference: -6.6% to 1.2%).

Emergency Department Use According to Diagnosis

Table 3 summarizes emergency department visits according to the diagnosis recorded on claims. Although 50% to 60% of the visits had a diagnosis discussed in *First Look*, the percentages of emergency department visits for these specific conditions were similar in the intervention and control groups in both health plans. Overall, the intervention did not lead to proportionately fewer visits for conditions

Table 2. Emergency Department and Physician Office Visits During the Follow-up Period

	Plan A		Plan B	
	Control	Intervention	Control	Intervention
Households				
Emergency department visit	55	52*	43	44
Physician office visit	84	82	67	68
Household members				
Emergency department visit	24	23	28	27
Physician office visit	54	52	53	51

Results are expressed as a percentage of households or household members who visited an emergency department or physician office after the *First Look* booklet was mailed.

**P* < .05.

discussed in *First Look*. Exclusion of the 4% of visits that led to a hospital admission in each health plan did not alter the results (data not shown).

... DISCUSSION ...

Mailing a booklet of information to Medicaid beneficiaries to encourage and assist use of nonemergency services and self-care for nonurgent conditions had minimal effect on use of emergency department or primary care physician services. The 95% CIs on the observed 1% reduction in the percentage of members who visited an emergency department in 2 separate health plans estimate that the true effect of mailing *First Look* ranged from no reduction to a less than 4% reduction. Because visits to an office-based physician did not increase, continuity of care most likely was not improved over the 6.5 months of follow-up. With an estimated cost of mailing *First Look* to the 3344 households in the study control groups at \$13,343 (\$3.99 per household) and with an average emergency department claim in the study health plans during the first 6 months of 1998 at approximately \$200, the intervention would have to reduce emergency department visits in the control groups by 67 visits

(\$13,343/\$200) or by approximately 2% to break even. Therefore, the potential to reduce costs by mailing *First Look* to Medicaid beneficiaries was low, unless members' use of the book during the period extending beyond this investigation resulted in cumulative effects.

This investigation did not survey members to determine whether recommendations in the booklet were followed before an emergency room visit. If members did attempt to see an office-based physician, this was not reflected in increased visits to physicians' offices. It is possible that members were unable to schedule an appointment that addressed their perceived needs in a timely manner or that the contacted physicians referred members to emergency departments.¹⁶ In Plan A, very few members who were sent *First Look* used the free telephone access to nurse assistance. Nursing assistance calls could not be determined for Plan B. Access to phones may be limited in some households of Medicaid beneficiaries. Studies have indicated that people who use emergency services for nonurgent conditions are aware of alternatives but choose not to use them for a variety of reasons.¹⁷⁻²¹ For example, emergency departments often provide ready access to care because of their location and 24-hour walk-in availability, which may reduce problems

with transportation or work schedules. Hence, recommendations to use office-based physicians may not be influential if such factors are the primary reason for using an emergency department.

For information to be effective, it must be available when needed, viewed as relevant by the recipients, and easily integrated into a decision on managing a medical condition.²² Although a focus group indicated that *First Look* was easy to understand, members of the focus group were not faced with the uncertainty of a medical situation that required them to locate, read, and apply the information. Thus, the *First Look*

Table 3. Emergency Department Visits for Conditions Discussed in *First Look*

Diagnosis on Claim	Plan A		Plan B	
	Control	Intervention	Control	Intervention
Cold, flu, sore throat	15.7	16.2	6.0	4.4
Burns, bruises, bites, cuts	13.4	14.2	13.7	12.0
Sprains and strains	8.9	8.6	4.2	4.7
Otitis media	6.3	6.2	5.0	7.4
Nausea, vomiting, diarrhea	5.7	5.7	3.2	3.8
Urinary/vaginal infection	3.7	4.3	4.6	3.8
Headache, sinusitis	2.9	2.5	2.4	1.9
Asthma	2.9	2.9	8.6	12.9
Childhood virus (measles, etc)	0.6	0.7	0.5	0.4
Total	60.2	61.5	48.2	51.4

Results are expressed as a percentage of emergency department visits.

booklet may not have been kept for ready referral, the information in *First Look* may not have fit members' perceptions of the medical problem or its urgency, or the recipients of *First Look* may have preferred to rely on past experience and access to emergency departments rather than process new information and find new ways to meet their medical needs. Indeed, members may not have perceived any adverse consequence from ignoring the information or any benefit from using the suggested alternatives to emergency services.

Study Limitations

The results of this study in Medicaid beneficiaries enrolled in 2 health plans may not be applicable to other populations. The selected households had a history of emergency room use, despite having at least 9 months to establish relationships with primary care physicians who provided services to health plan members. Differences in access barriers, cultural characteristics, frequency of residential change, and educational background could alter the effectiveness of mailing *First Look* to other populations. An unknown number of members in the present study relied on a language other than English. Although very few households in this study used the prepaid postcard to request a Spanish translation, it is possible that unrecognized language barriers reduced the effectiveness of the study intervention. Blue Cross and Blue Shield of Massachusetts recently released a news report that suggested that a self-care book distributed to 15,000 households reduced emergency department use for select conditions to a small extent. This finding is not inconsistent with the present study in that small effects of written healthcare information on use of emergency services were not excluded in the present study and the 2 study populations may have differed in important ways as previously discussed.

Variation in case mix among health plans may also influence generalization of our results, as well as the intervention and control group comparisons. A complete facility, professional, and pharmacy claims history was not extracted to characterize the prevalence of chronic diseases. The similar use of emergency departments and physician visits during the baseline period, however, suggests that any difference in case mix did not influence the overall use of services. Medical conditions discussed in the booklet and the diagnoses associated with emergency department visits tracked during follow-up were primarily acute intermittent conditions such as colds, flu, sore throats, and sprains. The prevalence of

chronic conditions such as asthma, however, may affect emergency department use for conditions such as colds and flu. As shown in Table 3, the percentages of emergency department visits for asthma in the intervention and control groups were identical in Plan A, but not in Plan B. The possibility that randomization did not balance the case mix in the intervention and control groups cannot be excluded.

Randomization of households to the intervention and control groups resulted in 1% to 3% differences in gender, age distribution, and baseline emergency department use. These variables may be related to subsequent use of emergency departments. We did not perform a multivariable analysis to statistically adjust for these small baseline differences because of the difficulty in defining an appropriate age and gender for a household and the complexity of a member-level multivariable analysis that must take into consideration an unknown correlation between members' use of emergency departments within a household.²³ The similarity of estimates of the effect of the intervention in Plans A and B, despite differences in baseline characteristics, suggested that adjustments for the small baseline differences would not influence the conclusions of the study. Furthermore, the study intervention did not have an effect on emergency department use in a separate subgroup analysis of children and adults.

Future Directions

Use of emergency departments for nonurgent conditions is a complex phenomenon driven by a multitude of factors. Attempts to manage this aspect of healthcare, including the intervention used in our study, have not produced dramatic results. Other avenues include screening administrative claims to identify members with frequent emergency department use in the absence of primary care visits and calling such members to determine reasons for their use of emergency departments. Whether a health plan can provide assistance to reduce emergency department use remains to be determined. For example, health plans could determine whether primary care physicians in areas with high emergency department use encourage this use by Medicaid recipients who try to make an appointment, and then work with physicians to change this practice. Another approach would be to provide tiered payments to emergency departments and reimburse charges for nonurgent services at the Medicaid rate for a physician office visit. The cost effectiveness of these suggestions needs to be determined. Multiple interventions that address the many factors that

drive use of emergency departments for nonurgent conditions may be necessary, although expensive multifaceted efforts may not result in a more cost-effective healthcare system.

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