The Impact of Follow-up Telephone Calls to Patients After Hospitalization

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We studied whether pharmacists involved in discharge planning can improve patient satisfaction and outcomes by providing telephone follow-up after hospital discharge. We conducted a randomized trial at the General Medical Service of an academic teaching hospital. We enrolled General Medical Service patients who received pharmacy-facilitated discharge from the hospital to home. The intervention consisted of a follow-up phone call by a pharmacist 2 days after discharge. During the phone call, pharmacists asked patients about their medications, including whether they obtained and understood how to take them. Two weeks after discharge, we mailed all patients a questionnaire to assess satisfaction with hospitalization and reviewed hospital records. Of the 1,958 patients discharged from the General Medical Service from August 1, 1998 to March 31, 1999, 221 patients consented to participate. We randomized 110 to the intervention group (phone call) and 111 to the control group (no phone call). Patients returned 145 (66%) surveys. More patients in the phone call than the no phone call group were satisfied with discharge medication instructions (86% vs. 61%, $P = 0.007$). The phone call allowed pharmacists to identify and resolve medication-related problems for 15 patients (19%). Twelve patients (15%) contacted by telephone reported new medical problems requiring referral to their inpatient team. Fewer pa-

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tients from the phone call group returned to the emergency department within 30 days (10% phone call vs. 24% no phone call, $P = 0.005$). A follow-up phone call by a pharmacist involved in the hospital care of patients was associated with increased patient satisfaction, resolution of medication-related problems, and fewer return visits to the emergency department.

Hospital discharge can be a time of significant patient dissatisfaction, as patients transition to a new environment and are expected to understand and recall complex medication and other instruction despite feeling unwell and being under stress. One mechanism that may improve patient satisfaction and clinical outcomes at the time of discharge is the use of follow-up telephone calls. Telephone calls made to patients after an emergency department visit have been shown to increase patient satisfaction, increase the number of patients keeping follow-up appointments, and improve patient adherence to discharge instructions.[1-4] Similarly, telephoning patients after hospitalization for acute myocardial infarction has been shown to increase smoking cessation rates.[5] In the majority of these studies nurses telephoned the patients; the impact of a pharmacist-based system has not been evaluated.

Given reductions in length of stay, the discharge process and postdischarge treatment plan are increasingly important and complex. Not only are patients discharged sooner, but physicians overestimate patients' understanding of discharge plans.[6] Moreover, the growth of the hospitalist model means that more discharges involve a transfer of care from one physician to another, further raising the stakes.[7]

We conducted a randomized, controlled trial to determine the impact of a follow-up telephone call made by pharmacists on patient satisfaction and other outcomes for patients discharged home from an inpatient, hospitalist-based medical service.

Methods

Setting

The Medical Center at the University of California, San Francisco (UCSF), is a 520-bed academic teaching hospital and referral center. The inpatient General Medical Service consists of 4 teams each composed of an attending physician, 1 resident, 1 or 2 interns, up to 2 medical students, and a member of the pharmacy service (pharmacist or pharmacy student).

The pharmacy service provides pharmacy-facilitated discharges to patients discharged to home. A pharmacy-facilitated discharge is defined as provision of patient counseling (verbal and written material) on all discharge medications, assistance in obtaining medications including telephoning discharge prescriptions to the patient's pharmacy, and completing necessary third-party insurance forms. The vast majority of inpatients are cared for by physicians distinct from their primary care physicians, 32% of the inpatient physicians meet the definition of hospitalist, and hospitalists serve as attending physicians for 52% of inpatient-months.[8]

Subjects

Patients hospitalized on the General Medical Service from July 1998 through March 1999 were eligible for the study. We included only those patients who received a pharmacy-facilitated discharge and were discharged to home. Patient confidentiality was maintained throughout the study by assignment of code numbers. We excluded those patients who were discharged to a nursing home, acute rehabilitation center, inpatient hospice, other acute hospital; homeless; non–English speakers; or unable to participate in a telephone conversation or complete a written satisfaction survey. All participants gave written informed consent according to the protocol that was approved by the UCSF Committee on Human Research.

Intervention

At the time of discharge, as many patients as possible received pharmacy-facilitated discharges. Many (approximately 70%) did not receive pharmacy-facilitated discharges because of the inability to fully staff the service every day and on weekends. In order to prevent bias in those pharmacists providing discharge medication information, we waited until after discharge to randomize patients receiving pharmacy-facilitated discharges to either receive a follow-up telephone call (intervention group) or not to receive a follow-up telephone call (control group). Within 2 days of discharge, patients randomized to the phone call group received a telephone call from a member of the pharmacy service who was not necessarily the same person who completed that patient's pharmacy-facilitated discharges. The content of the call followed a script to ensure consistency. During the call, we asked patients how they had been feeling since returning home, if they had any questions regarding follow-up appointments or the care they received during their recent inpatient stay, if they were able to obtain all their medications, if they understood how

to take their medications, if they had experienced any medication-related side effects, and if they had any other questions or concerns. As needed, the member of the pharmacy service making the call intervened to correct the medication-related problems and notified the inpatient medicine team of patient-reported symptoms or concerns. If we were unable to contact the patient after 3 attempts, we considered the patient lost to follow-up. We collected patient sex, age, and discharge diagnosis from chart review.

We mailed satisfaction surveys to all patients at 2 weeks and 6 weeks after discharge. The surveys were color coded to identify whether they were completed by a patient randomized to the phone call or no phone call group but otherwise had no identifying information in order to protect patient confidentiality and encourage uninhibited responses. We asked patients to ignore the second survey if they had completed the first. The mailed survey assessed patient satisfaction in the following areas: general satisfaction with care; satisfaction with attending physician care; satisfaction with other physicians' care; satisfaction with discharge information; including medication instructions; and whether they felt that their length of stay was too long, too short, or about right. In addition, patients were asked whether they had a follow-up appointment and for any comments regarding their recent hospital stay. We reviewed UCSF hospital records to document emergency department (ED) visits and readmissions to the hospital within 30 days of discharge.

Statistics

We performed descriptive statistics on demographic variables. We used χ^2 analysis to examine differences between groups in satisfaction with care and return to the ED or readmission to UCSF within 30 days of discharge. We used a t test to examine differences between continuous variables. We performed intention-to-treat analyses, used 2-tailed tests throughout, and a $P = 0.05$ to determine statistical significance.

Results

Between July 1998 and March 1999, 1,958 patients were discharged from the General Medical Service. We were unable to approach 1,202 patients during the study period because of the high census of the service and limited number of pharmacy staff. Of the 756 patients (39%) considered for pharmacy-facilitated discharge, we excluded 535 (71%) for the reasons listed in Fig 1. We randomized the remaining 221 patients to the phone call group (n = 110) or no phone call group (n = 111). The 2 groups were similar with respect to age, sex, and discharge diagnoses (Table 1). We contacted 79 of 110 phone call group patients by telephone.

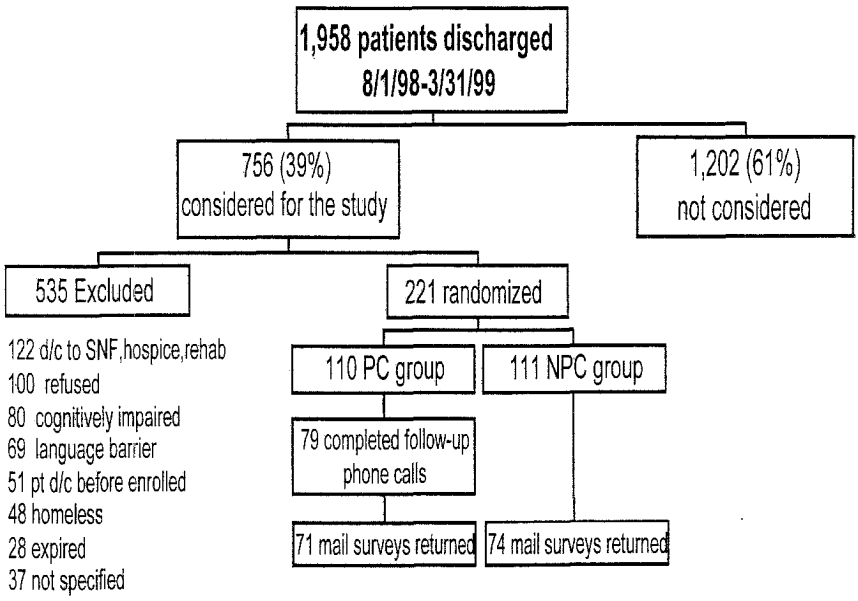

FIG 1. Subject selection. D/c = discharged; NPC = no phone call; PC = phone call; SNF = skilled nursing facility.

In the remaining 31 cases, a member of the pharmacy service was unable to contact the patient despite 3 attempts. There were no significant differences between the patients in the phone call group that we were able to contact and those we could not contact.

Telephone Calls

In the 79 cases where we completed a follow-up telephone call, 66% of patients felt improved. Further, 25% of patients had questions about their medications, 11% had questions regarding the care they received while hospitalized, and 11% had questions regarding follow-up care (Table 2). Nearly 1 of every 5 patients (19%) had been unable to obtain all of their discharge prescriptions (Table 2). In each case, the pharmacy service intervened successfully to obtain medications for the patients. Furthermore, 12 patients (15%) reported new problems or such concerns as rash, fever, dizziness, vomiting, diarrhea, constipation, abdominal pain, elevated blood pressure and heart rate, requiring signature on insurance papers or clarification on a follow-up appointment date that required referral to the inpatient team.

TABLE 1. *Patient Characteristics*

Characteristic	PC n = 110	NPC n = 111	*P*-Value
Mean age (yr ± SD)	57 ± 18	53 ± 20	0.13*
Sex (% female)†	59	48	0.09†
Most common discharge diagnoses (n)			
Pneumonia	12	10	
COPD	8	5	
GIB	6	5	
Asthma	6	2	
PE/DVT	6	2	
Gastroenteritis	5	3	
UTI/pyelonephritis	4	9	
Cystic fibrosis	4	8	
Pancreatitis	4	3	
Colon cancer	2	2	
Cellulitis	3	2	
Other (includes sickle cell pain crisis, hyponatremia, HIV, cholangitis, anemia, and chemotherapy)	50	60	

COPD = chronic obstructive pulmonary disease; DVT = deep vein thrombosis; GIB = gastrointestinal bleed; HIV = human immunodeficiency virus; NPC = no phone call group (control); PC = phone call group (intervention); PE = pulmonary embolism; UTI = urinary tract infection.

*Student *t* test.

†χ^2 test.

Patient Satisfaction

We received satisfaction surveys from 71 of 110 patients (65%) in the phone call group and 74 of 111 (67%) in the no phone call group (Table 3). Overall satisfaction was high in both groups. However, patient satisfaction with medication instruction was significantly higher in the phone call group (86% vs. 61% very satisfied, $P = 0.007$). Satisfaction with attending physician care (86% vs. 76% very satisfied, $P = 0.12$) and overall satisfaction with care (82% vs. 77% very satisfied, $P = 0.48$) were high in both groups.

ED Visit and Readmissions

Fewer patients in the phone call group (11 patients) than in the no phone call group (27 patients) had a subsequent visit to the UCSF emergency department within 30 days of discharge (10% phone call vs. 24% no phone call, $P = 0.005$). Additionally, although not statistically significant, we observed a trend toward fewer hospital readmissions within 30 days of discharge for the phone call group compared with the no phone call group (15% phone call vs. 25% no phone call, $P = 0.07$).

TABLE 2. Results of Questions Asked of Patients (n = 79) Randomized to the Phone Call Group Who Were Contacted by Telephone

	Patients, % (n)
How have you been feeling since returning home?	
Better	66 (52)
Same	24 (19)
Worse	10 (8)
Do you have questions about your medicines?	
Yes	24 (19)
No	70 (55)
Did not answer	6 (5)
Do you have questions regarding care you received during your hospitalization?	
Yes	11 (9)
No	89 (70)
Do you have any questions regarding follow-up?	
Yes	11 (9)
No	87 (69)
Did not answer	1 (1)
Were you able to get all your prescribed medicines?	
Yes	77 (61)
No	19 (15)
Did not answer	4 (3)
Do you understand how to take all of your medicines?	
Yes	90 (71)
No	3 (2)
Did not answer	8 (6)

Discussion

A telephone call by a pharmacist within 48 hours after patient discharge from the General Medical Service identified a substantial number of patients who needed medical attention or assistance in obtaining medications, improved satisfaction with medication discharge instructions, and decreased return visits to the ED. The pharmacist referred the patient to a physician in 15% of the cases, answered questions the patients had about their medications 24% of the time, and assisted patients who were unable to acquire all of their medications after discharge in 19% of cases. Thus, the postdischarge telephone call allowed for rapid identification of new and potentially significant patient-reported problems requiring intervention. Our results are similar to those of Kelly et al,[9] who found that a

TABLE 3. Patient Satisfaction with Aspects of Inpatient Care

	PC (n = 71)	NPC (n = 74)	*P* Value
Very satisfied (%)			
Received enough information about taking care of self at home	96	89	0.13
Satisfied with medication instructions	86	61	0.007
Satisfaction with physician	86	76	0.12
Satisfaction with care	82	77	0.48
Yes (%)			
Understand how to take medications	87	91	0.53
Ready to leave hospital	86	78	0.23
No problems with medications	83	81	0.78

NPC = no telephone call group (control); PC = telephone call group (intervention).

telephone call was a valuable tool in assessing adverse effects and patient needs between chemotherapy treatments.

The lower rate of ED visits and unscheduled readmissions within 30 days that we observed in the phone call group is a potentially important finding and warrants further study. It may be that this effect is the result of the fact that the pharmacists were able to intervene in the care of those 15% of patients who reported new symptoms or concerns and the 19% who were unable to obtain all of their medications. If confirmed in future studies, postdischarge phone calls could provide a simple yet effective way to substantially improve care while reducing adverse outcomes and controlling costs. Looking at a simplified economic analysis, we estimated that the pharmacy-facilitated discharge process took an average of 30 minutes per patient. In addition, the total time to make phone calls was approximately 10 minutes per patient for a total of 40 minutes of pharmacist time per patient for our approach. Based on a mean salary of $40 per hour for a clinical pharmacist at UCSF, the cost of this approach is $27 per patient, for a total of $2,970 for 110 patients in the intervention group. A pharmacy-facilitated discharge and calls to intervention group patients were associated with 16 fewer ED visits. This approach becomes cost saving at an ED visit cost over $185. Given that the average cost of an ED visit for a medicine patient at UCSF is $930, the total cost averted is $14,880 and the total cost savings of this approach is $11,910 ($14,880 − $2,970).

The present study has several limitations. First, we were not able to

contact all of the patients who were randomized to receive a phone call. Because we used an intention-to-treat (in this case, to call) analysis, this effect would, if anything, lead us to potentially underestimate the impact of the phone call. Second, we evaluated only 1 service within our institution, thereby limiting the generalizability of our results. Third, although we used a script for the telephone calls, the potential exists for variability in the phone call discussion itself. Fourth, although the finding of a decreased return to ED within 30 days in the phone call group was statistically and clinically significant, this outcome was not set a priori. Although it is possible that this result occurred by chance, the reports of new symptoms and of problems obtaining medications among phone call group patients suggest a plausible mechanism for this outcome. Because of the randomized design, it is unlikely that any systematic bias led to our results. It will be important to confirm this finding in future studies. Fifth, our findings could be the result of baseline differences in the 2 groups, for example 6 patients in the phone call group had a diagnosis of asthma compared with 2 in the no phone call group. Unfortunately, the large number of diagnoses and the limited number of return visits to the emergency department make a multivariate analysis unfeasible. Next, only a minority of patients on the medical service received pharmacy-facilitated discharges and were eligible for the study. It is possible that including other patients would alter the impact of the phone call intervention. It will be important in future research to assess the impact of this intervention in specific patient populations, such as non–English speakers, the homeless, and patients on other services. Finally, pharmacists made all phone calls to patients in this study. It is possible that calls made by other members of the team would have a different impact.

Conclusion

Providers have long been concerned that the postdischarge period is one in which significant problems might arise and escalate before the patient is seen in follow-up. This problem has only grown in importance with the increasing popularity of hospitalist systems, which introduce a purposeful discontinuity between inpatient and outpatient providers. As the hospitalist model grows, the need for adequate systems to ensure appropriate care and follow-up for patients after discharge will grow with it. We found that postdischarge telephone calls can identify important opportunities for intervention and may even prevent future problems.

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