ORIGINAL ARTICLES

Outcomes of Telephone Medical Care

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OBJECTIVES: To document the outcomes of a telephone coverage system and identify patient characteristics that may predict these outcomes.

DESIGN: Telephone survey.

SETTING: An academic outpatient medical practice that has a physician telephone coverage service.

PATIENTS: All patients (483) who called during the 3-week study period to speak to a physician were evaluated, and for the 180 patients with symptoms, attempts were made to survey them by telephone 1 week after their initial telephone call.

MEASUREMENTS AND MAIN RESULTS: The mean age of the 180 patients was 41 years, 71% were female, and 56% belonged to commercial managed care plans. In the week after the initial telephone call, the following outcomes were reported: 27% of the patients had no further contact with the practice; 9% filled a prescription medication; 19% called the practice again; 48% kept an earlier appointment in the practice; 3% saw an internist elsewhere; 8% saw a specialist; 8% went to an emergency department; 4% were admitted to a hospital. Of the 180 patients who called with symptoms, 160 (89%) were successfully contacted for survey. Eighty-seven percent of these 160 patients rated their satisfaction with the care they received over the telephone as excellent, very good, or good. In multivariate analysis, patients' own health perception identified those most likely to have symptom relief ($p = .002$), and symptom relief, in turn, was a strong predictor of high patient satisfaction ($p = .006$). Thirty-three percent of the 160 patients reported that they would have gone to an emergency department if a physician were not available by telephone.

CONCLUSIONS: In the present study, younger patients, female patients, and patients in commercial managed care plans used the telephone most frequently. Also, the telephone provided a viable alternative to emergency department and walk-in visits. Overall satisfaction with telephone medicine was high, and the strongest predictors of high patient satisfaction were symptom relief and patients' own health perception.

KEY WORDS: telephone; telephone medicine; survey; outcomes; satisfaction.

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Telephone medicine accounts for up to 25% of patient encounters in internal medicine and even more so in other primary care fields such as pediatrics.¹ Although telephone medicine has become an increasingly important method of managing patients, there are limited data about the outcomes of patient-physician telephone interactions or patient satisfaction with these interactions. Previous studies of telephone medicine have examined the range of symptoms that lead patients to call, the characteristics of frequent callers, the physician and patient perceptions of the same telephone call, and the use of the telephone as a substitute for routine clinic follow-up.¹⁻⁹ The study by Greenhouse and Probst also looked at patient satisfaction in telephone care by surveying after-hour callers.⁵ The study by Dale et al. examined patient satisfaction of telephone advice but from the standpoint of an emergency department.¹⁰

Little is known about the outcomes of telephone interactions in terms of whether patients follow their physicians' recommendations, whether patient symptoms are resolved, whether patients seek medical care elsewhere, or whether they are satisfied with their telephone interaction. With telephone medicine being increasingly used as a means of medical care, it is important for medical practices to have data on their own telephone services including clinical outcomes and patient satisfaction in order to remain competitive and to identify areas for improvement.

The objective of the present study was to document the outcomes of medical interactions by telephone in an outpatient medicine practice. This outpatient practice is located at an academic medical center that has a telephone medicine coverage service staffed by resident physicians. Outcomes that were evaluated include the actions taken by patients, the extent to which patients followed the physicians' recommendations, the patients' symptom relief, and patient satisfaction with the telephone interaction. Furthermore, the study sought to define whether patient characteristics, such as age, gender, and health perception, correlated with the level of symptom relief and patient satisfaction resulting from the patient-physician telephone interaction.

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METHODS

Description of the Practice

The present study was conducted at Cornell Internal Medicine Associates (CIMA), the internal medicine practice site of The New York Hospital/Cornell Medical Center. Nineteen general internists and 115 resident physicians, each with an assigned panel of patients, serve 25,000 active patients who generate approximately 45,000 visits per year. The resident physicians are responsible for approximately 59% of the patient visits. Fifty-nine percent of the patients are female. The mean age $\pm$ SD of the patient population in the practice is 49 ± 18 years. The practice serves patients from a broad socioeconomic spectrum; at the time of the study, approximately 53% had either Medicaid or Medicare coverage, and 34% had private insurance or belonged to a managed care health plan. The remaining 13% were either "self-pay" or had unknown insurance.

The attending and resident physicians regularly take telephone calls from their own patients. The usual practice is for attending and resident physicians to take their own calls during business hours. If a patient is unable to reach his or her primary physician, a designated practice physician is always available by telephone 24 hours per day. This practice telephone physician is a second- or third-year medicine resident on ambulatory block rotation with an attending physician supervising. The residents receive a half-hour introduction to telephone medicine during the outpatient block orientation session. The telephone physician has access to the patients' data at all times through the computer and the outpatient chart.

Study Period and Patients

The study was conducted during the 3-week period from July 29 to August 18, 1996, during which 12 separate residents served as the practice telephone physician. The usual system for telephone triage was used. During office hours, telephones were initially answered by four operators who answer the telephone full time. During the study period, the practice received approximately 700 calls per day. The operator dealt with any administrative or scheduling issues and triaged calls about routine medication refills to the practice nurse. All other calls were forwarded to the telephone physician. After-hours, an answering service answered the telephone calls and forwarded them to the resident physician on call.

All telephone calls during the study period made to the practice that were triaged by the operator to the telephone physician were considered. Calls to patients initiated by physicians were not included. Calls by patients directly to the patients' own physician were not included. The telephone physician routinely recorded information about the patient's name, reason for the call, and the recommendation to the patient. The computer system for the practice (CLIMACS, developed by J. Hollenberg, Roslyn, NY)

had all the information about demographics, appointments, diagnoses, medications, test results, procedures ordered, as well as telephone messages about the patient. Information about the patients' age, gender, insurance coverage, whether the patients' primary physician is an attending physician or a resident, number of visits in the past year, and most recent prior visit was extracted from this database.

The telephone calls were divided into two categories: those that were self-reported symptoms (e.g., headache, nausea) and those that were not self-reported symptoms (e.g., test results, administrative issues, complex medication refills, laboratory calls regarding results, medical questions, phone physician unable to reach, other physician calling about patient, referral). If someone else called in place of a patient (e.g., a relative or a visiting nurse), these calls were placed in the category that was not self-reported symptoms and these callers were not interviewed. Attempts were made to interview all patients with self-reported symptoms 6 to 10 days after their initial telephone call to the practice. Calls were placed at different times of the day, to home and work numbers. Attempts to reach the patients were made daily until 14 days after their initial call to the practice physician. Once contacted, the surveyor asked the patient's permission to participate in a study looking at outcomes of telephone medical care. All the patients who were contacted agreed to participate in the survey. The surveyor then followed a scripted interview that included questions about patient outcomes, symptom relief, patient satisfaction, and alternatives to telephone medical care. Some patients called with symptoms more than once ($n = 9$), but these patients were contacted only one time in follow-up. In these cases, data from the patients' first symptom-related telephone call to the practice were used.

Statistical Analysis

Data from the survey were tabulated and evaluated using an Excel spreadsheet (Microsoft Corp.). Statistical analysis was performed using SAS software for Windows on a microcomputer. We used χ^2 to evaluate differences in proportions; Student's t test was used to evaluate univariate differences in continuous data. Logistic regression was employed to analyze the predictors of full symptom relief and excellent to very good patient satisfaction. The Institutional Review Board of The New York Hospital reviewed and approved this study.

RESULTS

All Calls

In our 3-week study period, 483 calls were forwarded to the practice's covering telephone physician, an average of 161 calls per week. Seventy percent of these calls were

during office hours (9 AM to 5 PM), and 30% were made after hours (nights and weekends). Figure 1 shows the breakdown of these calls. There was not enough information available on 13 calls (unable to read information from the records), and data on these calls and patients are not included. The 470 calls made by 423 patients who were included in the analysis were separated into two groups: 189 calls by the patients themselves that pertained to symptoms (e.g., nausea, cough, pain) and 281 calls that were not self-reported symptoms (e.g., test result, referral). In this second category, there were 45 calls, 18 (40%) of which did pertain to symptoms. The frequency and distribution of all the calls are shown in Figure 1.

The focus of the study was the 189 self-reported symptom calls made by 180 patients; these are the 180 patients we attempted to reach by telephone. Of these 180 patients, 160 (89%) were successfully contacted by telephone, most within 10 days after their initial call. The remaining 20 patients were not able to be reached because they were in the hospital ($n = 5$), they were out of town or on vacation ($n = 3$), or there was no answer, the telephone was disconnected, or only an answering machine was reached ($n = 12$). For these 20 patients, data about demographics, practice patterns, and physician recommendations were available through the telephone physicians' and computer records. Although not interviewed, partial outcomes data on these 20 patients were extracted through the computer and included in the results. The results about symptom relief, patient satisfaction, alternatives to telephone medicine, and predictors of symptom relief and patient satisfaction include data only on the 160 patients that were interviewed.

Table 1 shows the demographics (age, gender, insurance status) and practice patterns (attending vs resident as

primary physician, number of visits) of the 180 patients with self-reported symptoms, the 251 patients who called for reasons other than self-reported symptoms, and the practice population as a whole. There were no significant differences in demographics and practice patterns between all the patients who called with symptoms ($n = 180$) and the subset of these patients who were interviewed ($n = 160$).

Patients with Self-Reported Symptoms

The main analysis focuses on the 180 patients who called with self-reported symptoms. The symptoms were categorized into broad categories, such as upper respiratory or gastrointestinal (see Fig. 1). Seventy-two percent of the symptoms were acute, and 28% of these symptoms concerned chronic conditions. A considerable proportion of patients (38%) called with symptoms outside the traditional domain of internal medicine, and more appropriate for orthopedics, ophthalmology, dermatology, or gynecology.

The mean age of these callers was 41 ± 17 years compared with 49 ± 18 years for the practice population ($p < .001$). Seventy-one percent of the callers were female, higher than the practice's female population of 59% ($p < .005$). Fifty-one percent of these patients had an attending physician as their primary care physician compared with 44% of the patients in the practice population, a difference that was not statistically significant.

The insurance status of the patients is shown in Table 1. Of the patients who called with symptoms, 56% belonged to managed care health plans; in contrast, 34% of the practice population belongs to managed care ($p < .001$). The relative risk of a caller with symptoms belonging to an HMO as compared with having Medicaid or Medicare as their insurance was 2.5. The gender and age

* Symptoms that the 180 patients called about included upper respiratory (17%), gastrointestinal (14%), dermatologic (15%), orthopedic (16%), pulmonary (4%), genitourinary (6%), neurological (7%), ophthalmologic (3%), fatigue (6%), anxiety (1%), gynecological (4%), cardiovascular (2%), other (5%)

FIGURE 1. Frequency and distribution of all the telephone calls including the reasons for the symptom-related and the not-symptom-related telephone calls.

Table 1. Patient Demographics and Practice Patterns

Demographics	Patients With Self-Reported Symptoms, (n = 180)	Patients Without Self-Reported Symptoms, (n = 251)	Practice Population (n = 25,000 active patients)
Mean age, years	41*	48	49
Female, %	71†	68	59
Insurance, %			
Medicaid/Medicare	35*	56	53
Managed care	56*	32	34
Other	9	12	13
Attending physician, %	51	36	44
Visits in the past year (median), n	2	3	NA‡
Most recent visit (median), weeks	4	2.5	NA

*Significant at a level of $p < .001$ as compared with patients without symptoms and with the practice population as a whole.

†Significant at a level of $p < .005$ when compared with the practice population as a whole.

‡NA indicates not available or not applicable.

distributions of the 180 patients did not differ among the insurance categories.

The median number of visits in the past year was two. The patients' most recent visit to the practice was 4 weeks. Twenty-one (13%) of the patients called without ever having been seen in the practice. These were managed care patients who had signed up with one of the attending physicians but had not yet been seen.

Recommendations to Patients and Outcomes

Table 2 summarizes the physicians' recommendations to the 180 patients. The most frequent recommendation was arranging for an earlier visit. A key question in the survey was what the patients did in response to the physician recommendation in the week following the telephone call. These outcomes are listed in the first column of Table 2. Although patients received only one of five possible physician recommendations shown in the first row

of Table 2, the patients may have had more than one outcome. The most frequent patient outcome was an earlier appointment.

Compliance

Table 2 also presents the number of patients having the listed outcome based on the physician recommendation. The overall compliance rate with the physician recommendations exactly as directed by the physician was 77%. Compliance rates for the specific physician recommendation are given as percentages. Notably, only 52% of the patients who received "advice and reassurance only" had no further contact with the practice, though this does not imply they were not compliant. In fact, 31% of the patients who received "advice and reassurance only" called back to speak to a practice physician in the week following their initial telephone call, suggesting that their symptom may have not resolved or may have not been adequately man-

Table 2. Physicians' Recommendations and Patient Outcomes

Patient Outcomes	n	%	Physicians' Recommendations to Patients, n (%)				
			Reassurance Only (n = 52; 29%)	Reassurance and Prescription (n = 22; 12%)	Earlier Appointment (n = 89; 49%)	Referral (n = 4; 2%)	Emergency Department (n = 13; 7%)
No contact	48*	27	27†	6	12	1	2
Prescription	16	9	0	16 (73)‡	0	0	0
Earlier appointment	86	48	10	1	69 (78)	0	6
Specialist	15	8	5	0	5	3 (75)	2
Emergency department	15	8	2	0	3	0	10 (77)
Called back	34	19	16	4	10	0	4
Internist elsewhere	6	3	2	0	3	0	1
Admitted	7	4	0	1	3	0	3

*The total number of patient outcomes exceeds the total number of physician recommendations because each patient may have had more than one outcome.

†The numbers in the center of the table represent the number of patients having the listed outcome based on the physician recommendation.

‡The numbers in parentheses are percentages showing the compliance rates for the specific physician recommendation.

aged. Or alternatively, part of their instruction may have been to call back if their symptoms had not resolved.

Relief

At the time of follow-up 1 week after the index call, 35% of the patients reported that they experienced full relief of their initial symptom, 54% of patients reported partial relief, 10% reported that they still suffered from the symptom that led them to call, and 1% of the patients did not respond (Table 3). When comparing the patients who experienced full symptom relief with those who did not, there was no significant difference in age, gender, primary physician, or comorbidity (e.g., depression, obesity, asthma, diabetes). The patients who called with a chronic symptom (28%) as compared with the patients calling with a new or acute symptom (72%) were less likely to experience full symptom relief ($p = .04$). Another factor that played a role in symptom relief was the patient's own health perception. Twenty-six percent of patients rated their health as excellent, 25% as very good, 26% as good, 14% as fair, and 8% as poor. The patients who perceived their health as very good to excellent were more likely to experience full symptom relief ($p = .006$). Of note, relief was not significantly related to what the physician recommended or what the patient did in the following week.

Patient Satisfaction

Overall satisfaction with telephone medicine is shown in Table 3. Thirty-nine percent of patients rated the care they received over the telephone as excellent, 27% as very good, 21% as good, 6% as fair, 5% as poor, and 2% did not respond. The percentages in Table 3 represent the percentage of patients with the resulting level of satisfaction for each given level of symptom relief. For example, 79% of the patients with full symptom relief rated their satisfaction as very good to excellent; full symptom relief was a major contributor to very good to excellent patient satisfaction ($p = .007$). Other factors, such as age, gender, insurance, primary physician, number of visits in the past year, comorbid illnesses (e.g., depression, obesity, asthma, diabetes), physician recommendation, outcomes, and re-

ceipt of prescription, did not influence patient satisfaction. Furthermore, patient satisfaction was not affected by which resident physician took the telephone call.

We also were interested in whether patients were receptive to the telephone as a method of health care delivery in general. Thirty-eight percent of patients responded that the telephone is an acceptable means of medical care, 39% said that it is acceptable in some cases, and 17% said that it is not acceptable. Specific responses included: "for minor things it's great," "... instant service ..." or "can't discuss things over the phone ... have to point to where it hurts."

Alternative

The final survey question was, "What would you have done if you were not able to reach a physician by telephone?" The results are shown in Figure 2. Most notably, 33% of the patients reported that they would have gone to the emergency department.

DISCUSSION

The CIMA practice offers an opportunity to study patients of different socioeconomic backgrounds with various insurance plans in a one-class health care delivery system. In this academic practice, the patients that utilized the telephone coverage service for symptom-related calls were more likely to be young, female, and to belong to a managed care organization. The higher use of telephone medicine by managed care patients may be of significance for practices signing contracts with commercial insurers. Telephone calls and telephone management are often not included in the assessment of health care utilization of a population of patients. Billing for care rendered over the telephone is not presently routine for fee-for-service insurance policies, Medicare or Medicaid, or managed care organizations.¹¹⁻¹³ The efficient use of the telephone for medical care with high levels of patient satisfaction can be a bargaining point for providers with potential third party payers.

Patient satisfaction is increasingly used as an outcome measure in managed care.¹⁴ Recent studies have looked at patient satisfaction with telephone medicine, in-

Table 3. Patients' Symptom Relief Versus Overall Satisfaction

Symptom Relief	n	%	Patient Satisfaction, %		
			Excellent-Very Good (n = 104; 68%)	Good (n = 33; 21%)	Fair-Poor (n = 17; 11%)
Full	56	36*	79	14	7
Partial	82	53*	63	27	10
None	16	10	50	19	31

*The percentages vary slightly from those in the text because not all 160 patients responded to the relief and satisfaction questions; the denominator of patients in this table is 154 rather than 160.

FIGURE 2. Patients' responses to the question, "What would you have done if you were not able to reach a physician by telephone?"

cluding the Greenhouse and Probst study, in which 76.7% of patients were satisfied with how their after-hours calls were handled (satisfaction was a dichotomous variable),⁵ in the Dale et al. study patients calling the emergency department for advice expressed the overall satisfaction with the telephone consultation as very satisfied (54.9%), satisfied (31.5%), and dissatisfied (5.6%).¹⁰ These results are comparable with those found in the present study: 66% of the patients rated their satisfaction with the care that they received over the telephone as excellent or very good, and another 21% of patients rated their satisfaction as good. In our study, a strong predictor of very good to excellent patient satisfaction was the complete relief of symptoms experienced by patients, a finding that is not completely unexpected. In turn, symptom relief was predicted by very good to excellent health perception.

The question about what the patients would have done if they were unable to reach a physician by telephone at our practice ascertains their behavioral intention, which is shown to have good correlation with what patients actually would have done.¹⁵ Thirty-three percent of the patients responded that if they were not able to reach a practice physician by telephone they would have gone to an emergency department. In contrast, only 8% went to an emergency department after their telephone call. This potentially translates into a significant reduction in emergency department visits with their attendant high costs, long waits, and evaluation by physicians who often do not have access to the patient's medical records.

This study is limited by its observational nature, small sample size, and choice of the month of August as a study period. The unique setting of this study, an urban-based academic practice that combines patients of different payer groups, may mean that its results are not generalizable to other practice settings. However, our practice setting is also a strength in that it allows us to compare different payer groups in the same setting. Patient symptoms and number of calls may differ in August as compared with the rest of the year. Recall bias on the patients' behalf was minimized by surveying them close to their initial telephone call. The short interval after the initial call also helped keep survey nonresponders to a minimum. Another limitation of this study is that we may have excluded the sicker patients as we did not interview those who had others call in for them.

Having several resident physicians as the covering telephone physician introduces variability in dealing with patients over the telephone. Although there is no formal curriculum for training in telephone management, all the resident physicians who participated in this study had at least 1 month of experience serving as the covering telephone physician. The absence of a formal training curriculum in telephone management is not unique to this residency training program,¹⁶ and the TELI group and other investigators have shown that the effective introduction of a telephone management training program is feasible and desirable.¹⁷⁻²³

The focus of this study was telephone calls made by patients to the covering practice physician, not to the patients' primary physician. Physician recommendations, patient relief, satisfaction, and outcomes may be different if the physician has a long-term relationship with the patient to whom they are giving medical advice over the telephone.

Our study documented the outcomes that patients had when they initiated medical care by the telephone and showed that patients had good compliance and high levels of satisfaction with the care rendered over the telephone. Patients belonging to managed care organizations used the telephone more frequently for symptom-related issues. The telephone served as an alternative to self-referral to the emergency department, a finding that held true regardless of gender or insurance status. In this era of managed care, capitation, and cost containment, we need to optimize resource utilization by improving patient satisfaction and outcomes of telephone medical care.

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ANNOUNCEMENT

American Board of Internal Medicine

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