The Impact of a Telephone Care Pharmacy Program on Health Care Resource Utilization

OBJECTIVE: To analyze the activities and cost impact, based on health resource utilization, of a telephone care pharmacy (TCP) program in which patient care is provided by a clinical pharmacist. In addition to providing medication advice, the pharmacist is authorized to prescribe prescription refills for medically stable patients on chronic medications.

DESIGN: Retrospective study of 1,009 encounters during a one-month period (August 1997).

SETTING: Veterans Affairs Health Care System facility.

MAIN OUTCOME MEASURES: Health care utilization avoidance.

RESULTS: Of the 1,009 encounters recorded, 69% were related to prescription processing, while 31% required professional intervention. Sixty-four percent of these professional encounters resulted in a net health care utilization avoidance, primarily urgent care visits. In 38% of encounters requiring professional intervention, the pharmacist was able to independently take care of the patient’s needs, with 13% receiving drug information and 25% writing a prescription. Forty-three percent required discussion with the patient’s primary care provider before services were provided and 19% required a referral to the urgent care clinic.

The impact on resource utilization corresponded to a cost avoidance of $24,992 and incurred costs of $1,561 for the one-month period of analysis. Accounting for pharmacist salary and benefit costs of $12,809, the net cost avoidance was $10,622. This extrapolates to an annual cost avoidance of $127,464. Using a sensitivity analysis assuming 75% patient compliance with medical advice, the corresponding net cost avoidance was $4,374 for the one-month period of analysis and $52,488 for the annual net cost avoidance.

CONCLUSIONS: The TCP program decreased health care utilization, primarily as a result of decreased urgent care clinic visits, which potentially results in an annual net cost avoidance of up to $120,000.

KEYWORDS: Telephone care, pharmacists, costs, telemedicine

J Managed Care Pharm 2000: 217-221

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Telemedicine has been gaining popularity as a means of increasing patient access to care via telephone, teleconference media, or Internet-based applications. It has shown promise for improving therapeutic outcomes in poison-control centers, post-surgical medical support, telephone triage, and treatment of patients in rural areas. In addition, several telephone triage programs have reported improved patient satisfaction and decreased utilization of unscheduled physician visits and emergency department visits. However, the cost-effectiveness of these programs is not well established in the literature. A recent study reported that an interdisciplinary telephone-based care program staffed by a pharmacist, a patient service representative, and a registered nurse resulted in a potential net cost avoidance of $677,671 per year, primarily as a result of decreased urgent-care clinic use. However, no detailed formal cost analysis was provided for this study.

The Veterans Affairs (VA) institution in this study established a telephone care pharmacy (TCP) program in April 1996. The primary objective of the service is to provide veterans with increased access to pharmacy services, including provision of drug information and education. The purpose of this study was to analyze the types of telephone encounters received by the TCP program and to estimate the impact on health care utilization and associated cost.

Methods

Setting

The VA Palo Alto Health Care System is a 1,255-bed hospital and satellite outpatient clinic complex consisting of three medical center divisions and five satellite outpatient clinics located in the San Francisco and Monterey Bay areas of California. The VA Health Care System is a teaching center affiliated with Stanford University School of Medicine and cares for approximately 40,000 patients each year. The Pharmacy Service processes nearly one million prescriptions for these patients each year.

The TCP Program

The TCP program responds to patient calls Monday through Friday from 9:00 A.M. to 4:30 P.M. Patients can contact the program via a toll-free automated telephone system, which is shared by an automated prescription refill system.
miscah's general scope of practice in the program includes providing drug information and assisting the patient with medication needs. The pharmacist, under protocol and a defined scope of practice, has the authority to prescribe a partial supply of medication to last until the patient's next clinic visit (up to 90 days) in cases in which the patient has no refills on the prescription. In these cases, the pharmacist must determine that the patient is medically stable, adherent to therapy, and using the medication for a chronic disease. Under the TCP program protocol, the pharmacist may prescribe refills for all medications except antibiotics, psychiatric medications, and controlled substances.

The pharmacist records an electronic progress note describing each encounter in the patient's permanent medical record via the VA Decentralized Hospital Computer Program (DHCP) database system. The progress note includes the patient's name, the date and time of call, and free-form text describing the question and the corresponding details of the pharmacist's response.

Data Collection
The TCP received an average of 1,043 calls (±335 SD) per month in calendar year 1997. August 1997 was chosen as a representative month for pharmacist staffing and call volume. The electronic summaries for all documented encounters during this period were retrospectively screened and categorized. Each patient's electronic medical record was reviewed to determine the outcome of each call in terms of health care resource utilization following the encounter. The TCP program was staffed by two full-time pharmacists. Cost was assigned to each unit of resource utilization and a cost analysis was performed.

Categorization of Encounters
Encounters were first categorized into two broad categories: prescription processing-related encounters and encounters related to medication problems that required professional (clinical) intervention. Prescription processing-related encounters included problems that any pharmacy would address in the course of daily activities (e.g., refill procedure, requests for status of orders, or resolving orders not yet received). Encounters requiring professional (clinical) intervention included "zero refill" requests (the patient was requesting medication for which there were no refills remaining) and other medication concerns not associated with prescription processing. Because prescription processing-related encounters did not require clinical judgment and were part of daily pharmacy business activities, they were excluded from the health care resource utilization and cost analysis.

Based on the pharmacist's assessment of the patient's needs, encounters requiring professional intervention were further subdivided into the categories of medication refill and medication concerns.

Medication refills. When a patient with no provider-authorized refills contacted the TCP program, professional interventions were categorized in one of three ways. Following assessment of the patient's clinical status, the pharmacist: (1) prescribed a partial medication supply under protocol (as described above); (2) contacted the patient's provider; or (3) referred the patient to the urgent care clinic. Providers were contacted when the pharmacist determined that the patient's clinical status or condition did not warrant a partial supply without further consultation. Patients were referred to urgent care when the pharmacist deemed the dispensation of medication without a more detailed medical evaluation to be clinically inappropriate.

Medication concerns. If the patient called with medication concerns, the pharmacist took one of three courses of action. If the patient requested drug information, such as how to best administer the medication or what its indication or potential side effects are, the pharmacist supplied the patient with the appropriate information. If the pharmacist judged that patient-specific information was required to answer the question, the patient's primary provider was contacted. If upon evaluation of the patient's clinical status the pharmacist deter-
mined that the patient had an urgent need for medical evaluation, the patient was referred to the urgent care clinic.

Assessment of Health Care Resource Utilization

Encounters requiring professional intervention were assessed for impact on health care resource utilization using a projected health care utilization for each category of encounters described above (see Table 1).

For the purposes of this study, the authors assumed that if the TCP program did not exist, patients who required medication and had no remaining refills would present to the urgent care clinic. The majority of patients who called with a zero refill reported they had no medication remaining at home, and thus were in urgent need of care. In addition, urgent care physicians have observed that many patients use the clinic for medication refills. If the patient requested medication information, the study assumed that if the TCP program did not exist, the patient would have contacted his provider via the telephone, thus utilizing provider time. A conservative estimate of 10 minutes of provider time was used.

To ensure that the health care utilization projected with the TCP program reflected resources used, an electronic chart review was performed. Specifically, urgent care and early provider visits pertaining to the subject of the call were researched. These actual outcomes were utilized in the cost analysis.

A number of calls received by the TCP program were attributable to the large spinal cord injury population served by this facility. Based on experience prior to the TCP program, the authors assumed that if the TCP were not available, the spinal cord injury population would use existing resources (e.g., a spinal cord injury nurse specialist) rather than present to urgent care. Therefore, to calculate these calls as utilization of an urgent care visit would possibly overestimate health care utilization avoidance by the TCP. Because the spinal cord injury nurse specialist and the TCP pharmacist have approximately the same salary, the authors elected to exclude this group from the cost analysis.

Health care utilization avoidance for an encounter was defined as the substitution of a less time- or personnel-consuming activity for a more extensive activity—for example, utilization of 10 minutes of provider time instead of an urgent care visit. A more extensive utilization substituted for a less extensive one, as in the case of a patient’s being referred to the urgent care clinic when the patient would not otherwise have sought medical attention, constituted an incurred utilization. Resources incurred included those beyond the pharmacist’s scope of practice in the TCP, such as contacting providers for consultation or referral to urgent care.

Cost Analysis

The costs used for resource utilization calculations were based on 1997 dollars and were derived specifically at and for this institution. Amounts used for cost calculations were as follows: urgent care clinic visit, $152; medicine clinic visit, $103; provider time (salary plus benefits), $11 for ten minutes; pharmacist monthly salary (plus benefits), $6,404. Costs included salaries for providers and associated personnel, as well as office space. Other overhead costs (e.g., phone line, references) were not included in the cost analysis because only pre-existing resources were used in the establishment of the TCP program. Costs for laboratory or diagnostic tests and for medication administered during a visit were also excluded. Net cost avoidance was determined by subtracting costs incurred (based on chart review) from costs avoided (based on expected utilization) and taking into account salary and benefits for two full-time pharmacist equivalents.

Because both patient nonadherence to provider advice and self-treatment may occur, predicting projected patient behavior with 100% accuracy is not possible. A sensitivity analysis was performed on the cost data assuming that only 75% of the patients would utilize the expected health care resources in the absence of the TCP program as outlined in Table 1. Thus, cost analysis results were calculated assuming 75% and 100% rates of adherence. In addition, the percentile of adherence to expectations in which cost avoided is equal to cost incurred was determined.
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| TABLE 3 | Cost Impact of the Telephone Care Pharmacy Program (August 1997) |
| --- | --- | --- |
| Category | Cost Avoided | Cost Incurred |
| Zero Refills | | |
| Partial supply prescribed | $11,856 | — |
| Provider contacted | $11,400 | $812 |
| Urgent care referral | — | — |
| Medication Concerns | | |
| Medication information | $433 | — |
| Provider contacted | $1,216 | $87 |
| Urgent care referral | $87 | $662 |
| Pharmacists’ Salaries | — | $12,809 |
| Total | $24,992 | $14,370 |
| Net Cost Avoidance | $10,622 | |

Results

In August 1997 the TCP program documented 1,009 encounters. Figure 1 demonstrates the proportion of encounters in each category: 695 (69%) of the encounters were prescription-processing related; 314 (31%) required professional (clinical) intervention. Of the encounters that required clinical intervention, 201 (64%) resulted in a net resource utilization avoidance and 5 (2%) incurred utilization.

Table 2 summarizes the professional interventions. In 119 (38%) professional encounters, the pharmacist was able to independently satisfy the patient’s needs, with 79 (25%) patients receiving a partial supply of medication and 40 (13%) receiving drug information. One hundred thirty-four cases (43%) required assessment by the patient’s provider before services were provided. In 61 cases (19%), the pharmacist determined that the patient needed a referral to the urgent care clinic. Refill requests that received partial supplies of medication were by definition chronic medications. Over one-half of the medications for which providers were contacted were controlled substances, narcotics, or anxiolytics. Medications requested by patients who were referred to urgent care comprised a miscellaneous array of antibiotics, controlled substances, psychiatric medications, and other urgent treatments. Drug information questions consisted primarily of inquiries regarding administration, side effects, and tablet identification.

The impact on resource utilization corresponded to a cost avoidance of $24,992 while incurring costs of $1,561 for August 1997. Table 3 indicates the impact of the TCP program on cost. Taking into account the pharmacists’ salaries of $12,809, the net cost avoidance was $10,622. Extrapolated for one year, the cost avoidance totaled $127,464. Applying a sensitivity analysis assuming a 75% rate of patient compliance with medical advice, the corresponding net cost avoidance was $4,374 for the one-month period of analysis and $52,488 when extrapolated to an annual cost basis. The cost avoided equaled the cost incurred at a 58% rate of patient compliance with expectations.

Discussion

Net health care utilization avoidance costs predominantly reflect the pharmacists’ ability to perform a telephone assessment of a patient with no remaining prescription refills and, when appropriate, to prescribe a supply of medication under protocol within a defined scope of practice. This activity helps prevent utilization of the walk-in urgent care clinic. Given that the number of patient encounters with the TCP nearly doubled in the following year without a change in staffing, these costs may well largely underestimate true current cost avoidance. Although not analyzed in this study, additional program cost savings may also have been realized had nonprofessional (technical or clerical) staff handled the 69% of calls that were prescription-processing related.

Telemedicine has shown promise for improving therapeutic outcomes in poison control centers, post-surgical medical support, telephone triage, and treatment of patients in rural areas. In addition, several telephone triage programs have reported improved patient satisfaction with care and decreased utilization of unscheduled physician visits and emergency department visits. Although published literature includes little information on the effectiveness of telemedicine in the pharmacy setting, Simkins and Wenzloff found increased compliance when a telephone care message was used to remind patients to refill chronic cardiovascular disease medications.

A recent systematic review of the literature on distance medicine technologies suggested that the cost effectiveness of these programs is not well established. A detailed analysis of the cost impact of a pharmacist-based telemedicine program
apparently does not exist. An interdisciplinary telephone-based care program staffed by a pharmacist, a patient service representative, and a registered nurse recently reported a potential net cost avoidance of $677,671 as a result of decreased use of an urgent care clinic. However, this study did not provide a detailed cost analysis of costs incurred. In addition, the projected cost avoidance was based on a standardized VA interagency rate of $205 per outpatient visit.

In this study, an electronic chart review was performed to ensure that the health care resource utilization projected with the TCP program reflected actual utilization. Urgent care and early provider visits pertaining to the subject of the call were reviewed. In order to allow the study to characterize actual health care utilization costs avoided as well as costs incurred as a result of physician or clinic referrals, these actual outcomes were compared to the health care resource utilization that would be expected if the TCP service did not exist. Also, the authors were able to calculate costs based on actual data derived from the institution using specific salary and institutional overhead data. These cost estimates are lower than the VA interagency rates used in the previously reported study.

# Limitations

Certain limitations exist in any study of this nature and design. To assign health care resource utilization to each patient encounter, assumptions were made regarding the patient behavior that would be expected if the TCP program did not exist. Actual patient behavior may have been overestimated in this model. However, the study applied a sensitivity analysis in an attempt to minimize the impact of this assumption. When a 75% rate of compliance to medical advice was used, a net cost avoidance was still realized. Other possible outcomes, such as patient satisfaction and the impact on the efficiency (i.e., waiting time, staffing) of the walk-in urgent care clinic as a result of the TCP program, were beyond the scope of this study to measure. Nor did our study address any potential long-term effects of patient compliance with health care—in this case, forgoing routine doctor visits for up to 90 days in exchange for authorized refills.

In this study, an electronic chart review was performed to validate the actual occurrence of the health care resource utilization projected. It was not possible to accurately assess patient medical outcomes and costs, such as admissions or adverse events that were prevented as a result of advice from the TCP program. Given that 19% of all professional encounters and 21% of all zero refill encounters in this study required referral to the urgent care clinic following assessment by the pharmacist, analyzing such prevented admissions or adverse events is a critical factor that should be addressed in future studies. Whether these referrals prevented more costly health care utilization, such as hospital admissions or more extensive and expensive therapies, is unknown and merits future study.

# Conclusion

A pharmacist-based telephone care program at a Veterans Affairs Health Care System decreased health care resource utilization, primarily as a result of decreased urgent care clinic visits, resulting in a potential annual net cost avoidance of up to $120,000.

References