ORIGINAL RESEARCH

Harm Resulting from Inappropriate Telephone Triage in Primary Care

David E. Hildebrandt, PhD, John M. Westfall, MD, MPH, Douglas H. Fernald, MA, and Wilson D. Pace, MD

Purpose: **Our objective was to assess and categorize harm occurring to patients who called their physicians' office after-hours but did not have their call forwarded to the physician because they stated that their call was not an emergency.**

Methods: **We collected data on 4949 calls handled by our answering service for 1 year in a family medicine residency office in Denver, CO. Of the 2835 after-hours clinical calls, we reviewed all 288 clinical calls that were not forwarded to the "on-call" physician. Complete data on 119 clinical calls included reason for call, frequency of next day appointments, Emergency Department visits, hospital admissions and outcomes. Outcomes were reviewed and coded for harm to the patient by experienced medical errors coders.**

Results: **When patient calls were not forwarded, 51% had an appointment, 4% an Emergency Department visit, and 2% were admitted to the hospital within 2 weeks. Analysis revealed that 3% suffered harm, and 26% experienced discomfort due to the delay. Although 66% required no intervention, 1% required emergency transport and 4% a medication change.**

Conclusions: **Harm may occur when patients' calls are not forwarded to the on-call physician. Although the level of harm is generally temporary and minimal, the potential exists for serious harm to occur. Physicians need to re-evaluate the way they handle after-hours calls. (J Am Board Fam Med 2006; 19:437–42.)**

Over the past 10 years, the majority of studies of patient safety have focused on the hospital setting. A great deal of time, money, and energy has been spent identifying types of errors and system problems.[1–3] The frequency of errors has varied from 6% to 18% with only a small portion of those errors resulting in permanent harm or death to the patients treated.[4] Naturally, serious harm has garnered the most attention.[5] Recently, attention has been focused on the ambulatory care settings, where errors may be even more frequent. For example, in the ambulatory care setting, adverse drug events may occur at a rate that is 4 times higher than that found in the hospital setting.[6]

Attempts to classify the types of errors that occur in the ambulatory care setting have evolved in the past few years. Preliminary attempts focused on broad categories of errors such as "gaps in knowledge," "administrative failure," "treatment delivery lapse," and "miscommunication."[7,8] Applied Strategies for Improving Patient Safety (ASIPS)[9] used a detailed, multi-axial taxonomy containing 10 axes within 4 domains[10] to code safety events. The overall ASIPS project developed and implemented an ambulatory primary care error reporting system, received and analyzed error reports, and implemented interventions to improve patient safety. Analysis of error reports submitted to ASIPS indicated that communication problems represented the most frequent error process within the ambulatory care setting. Furthermore, the failure to complete communication between providers and patients was associated with an increased risk of clinical harm.

This article was externally peer-reviewed.

Submitted 28 October 2005; revised 21 February 2006; accepted 22 February 2006.

From the Department of Family Medicine, University of Colorado Health Sciences Center at Fitzsimons, Aurora, CO.

Conflict of interest: none declared.

Corresponding author: David E. Hildebrandt, PhD, Department of Family and Community Medicine, University of Minnesota, 101 Martin Luther King Jr. Drive, Mankato, MN 56001 (E-mail: dhildebrandt@bresnan.net).

We conducted a series of studies focusing on the after-hours telephone calls that patients make to physicians' offices. We have documented the frequency and nature of these calls,[11] described patients who call frequently,[12] and identified barriers to adequate patient-physician communication in current telephone triage systems.[13] Our previous study of offices in the Denver, CO metropolitan area found that two-thirds of primary care offices used an answering service, and 93% of these offices required the patient to decide if their problem was an "emergency."[13] In examining the calls triaged by patients, 90% were forwarded to the on-call physician but 10% were not. A panel of physicians who reviewed these calls reported they would have wanted to talk to the patient that evening in over 50% of the calls. In the present study, we have combined resources with the ASIPS staff to evaluate the actual clinical outcomes for patients who decided their problem was not an emergency and whose phone calls were not forwarded to the on-call physician.

Methods

All after-hours telephone calls (5 PM to 8 AM, weekends and holidays) made to a free-standing community-based family practice training program were collected for the 12-month period between April 2000 and March 2001.[11] A recorded message directed the caller to "call 911" if they had a life-threatening emergency or stay on the line and the operator would help them. The operator recorded date and time of the call, caller's and patient's first and last name, primary care physician, patient's pregnancy status, date of last office visit, and chief complaint(s). Finally, the operator asked whether or not the caller felt this was an emergency. Only calls reported by the caller to be an emergency were forwarded to the on-call physician. All information was recorded and a paper copy was faxed to the office the next morning for review and management. For the present study, all after-hours clinical phone calls (N = 288) during a 1-year period that were not forwarded to the physician on call were evaluated.

Chart abstraction and hospital database review identified the reason(s) for the call, frequency of next day appointments, emergency department (ED) visits, hospital admissions, diagnoses and treatments, and outcome of the visits. The data were abstracted approximately 2 years after the calls were made, and some charts were not available due to a variety of reasons. Of the 288 charts, 29 had no name on the fax sent to the office the next day, and 140 had incomplete data or the chart could not be found. Many callers were not registered patients in the practice and had never been seen in the office; others had transferred care, and their charts could not be located in the practice; and some patients were deceased or had moved, and their charts had been archived and were no longer available. We report on a total of 119 patients with complete data.

A complete description of the data abstraction procedure has been described elsewhere.[10,12] The age, sex, reason for call, time of follow-up visit, physician-documented outcome, and treatment were coded using the ASIPS Dimensions of Medical Outcomes (DMO) taxonomy, which has been previously described.[14] Briefly, a team of trained coders (made up of 3 members, including one physician) reviewed and assigned all relevant codes from the DMO taxonomy to each event in a consensus approach. The team reviewed each of 119 abstracted cases and applied codes describing *the outcome of the event* which included: 1) the level of harm to the patient, 2) change in the status of the patient, and 3) any intervention required as a result of the delay in communication between the patient and the on-call physician.

Harm and Change in Patient Status

Six types of clinical harm were defined for coding: *minimal harm* was defined as a change in some physiologic function that did not require medical attention; *moderate harm* was defined as decreased function of an organ system but did not require hospitalization; *severe harm* was defined as a major change that required hospitalization; and *death*. *Increased future risk of clinical harm* was defined as potential for problems to the patient or others in the future (eg, a missed diagnosis of diabetes for several years or an Rh-negative woman who is sensitized due to failure to check a blood type during a spontaneous miscarriage) and *patient discomfort or inconvenience* (eg, prolongation of pain due to lack of treatment, or a patient having to return to the office to repeat an uncomfortable procedure).

Table 1. Overview of After-hours Calls and Patient Harm

Type of Call	N	%
All calls received when office was closed[11]	4949	—
After-hours calls[11] nighttime and weekends	3538	71
After-hours clinical calls[12]*	2835	57
After-hours clinical calls not forwarded[12]	288	10†
Final sample of clinical calls not forwarded with complete data	119	4†
Patient's suffering discomfort/harm	36	1.3†

* Not appointments, billing questions, or medication refills.
† Percentage of after-hours clinical calls.

Interventions Required Due to the Error

Medical interventions were defined as action taken as a result of the error. Examples of this include starting a new medication to mitigate harm, repeating diagnostic tests, ED visit as a result of the error, or requiring emergency transport. We coded "no intervention" in cases where patients received usual care for their diagnosis even though in some cases it may have been delayed.

The University of Colorado institutional review board (IRB) and the Rose Health One IRB approved this project.

Results

Table 1 presents how we obtained our final sample of subjects. In a 1-year period, there were 4949 total calls with 2835 after-hours clinical calls; 288 of these clinical calls were not forwarded to the on-call physician.

Table 2 presents the age, gender, number of office and ED visits, hospital admissions, harm and interventions required for the same group. When the patient's call was not forwarded, 51% of them had an office appointment in the next 2 weeks, 4% had an ED visit related to their original phone call and 2% were admitted to the hospital. One patient who called with "chest pain and the pain running down his left arm" was not forwarded to the on-call physician because he did not tell the operator that his problem was an emergency. This patient went to the ED anyway, was admitted, and diagnosed with gastrointestinal disease.

Of the 119 events, 37 (31%) had insufficient information in their chart dealing with the after-hours phone contact to determine patient outcome related to their phone call. Many office visit notes did not mention the previous phone call. Some patients were not seen in the office, affiliated ED, or hospital for months after the call. In the cases where we could determine the patient outcome, 3 patients suffered clinical harm. Two patients were at risk for future harm. Thirty-one of the 119 patients (26%) experienced continuing discomfort due to a delay in care. This discomfort was due to conditions such as untreated fractures, kidney stones, and pelvic pain. Seventy-eight patients (66%) did not require additional interventions or care beyond what would be typical for the specific diagnosis or condition. Eleven patients (8%) required at least one type of intervention including: emergency transport (n = 1), ED visit (n = 5), office visit (n = 2), medication change (n = 1), or other intervention (n = 2). Table 3 provides examples of particularly vivid cases that illustrate the potential problems when patients are required to determine

Table 2. Description of Calls Not Forwarded Group

Group	Clinical Calls Not Forwarded (n = 119)
Age (mean)	36
Gender	
Male	29%
Female	71%
Office Visits	
Within 1 week	44%
Within 2 weeks	7%
Total	51%
Emergency Department (ED) Visit within 2 weeks	
Any reason*	15%
Related reason†	4%
Hospitalized within 2 weeks	
Any reason*	15%
Related reason†	2%
Harm	
Clinical harm	2%
At risk for future harm	1%
Pain and/or discomfort	26%
Interventions required	8%
Emergency transport	1 patient
ED visit	5 patients
Office visit	2 patients
Medication change	1 patient
Other	2 patients

* Patient visit to ED or hospital admission was for any reason.
† Patient visit to ED or hospital was related to the reason for the after-hours call.

Table 3. Examples of After-hours Phone Calls Not Forwarded to On-call Physician

Age and Gender	Reason for Call	No. of Days before Follow-up	Harmed?	Patient Outcome	Intervention Due to Phone Call Not Being Forwarded
21 F	41 wks OB, leaking fluid	3	Moderate harm; increased future risk to patient	Went to ED with "extreme worsening pain and nausea"/right pyelonephritis	Emergency transport to ED
46 F	Pain in chest, going down left arm	Same day	Patient discomfort	Went to ED and admitted for medication interaction and psychological problems	No intervention needed
62 M	High blood sugar, doctor told him to call	1	Moderate harm; increased future risk to patient	Went to office with blood sugar 497, 6 wks polyuria, polydipsia, muscle cramps in lower extremities, ketones present; no prior history of diabetes; sent to ED for fluids	Emergency transport to ED
50 F	Ankle injury, fell off horse yesterday	Same day	No change in patient status.	Went to office, inability to bear weight on right ankle; distal fibular fracture, commuted, non-displaced; placed in short leg cast with walking shoe	No intervention needed
16 F	8 mo OB, pelvic pain and vaginal infection for 3 mo	1	Patient discomfort	Admitted to hospital; Cesarean section for acute chorioamnionitis; hospitalized for 4 days postsurgery	ED visit made
56 M	Please call	5	Patient inconvenience; patient discomfort	Went to ED with a sore throat, urinary tract infection; medications given to treat infection	ED visit made
17 M	High fever	3	Patient discomfort	Went to office with 3-day history of fever and chills, temperature to 103.5, x-ray shows mild right lower lobe streaky; atypical pneumonia; medications given	No intervention needed
43 M	Please call, health issue	1	No change in patient status	Went to office, history of prostate CA 5 years ago; over past 2 years, he has been getting angry at family members and others, because of his moodiness and anger, his wife left 1½ wks ago, family worried he is depressed and suicidal	No intervention needed
27 F	Chest pain, hard time breathing	2	Patient discomfort	Went to office with a pre-syncopal episode; set-up for Holter monitor	No intervention needed

whether their concern is an "emergency" and their call is not forwarded to the physician.

Conclusions

This study is the first to directly assess adverse patient outcomes due to the inability of patients to make contact with their physician after-hours. In telephone triage systems where the patient is left to decide whether their problem is serious, a small percentage of patients will not get through to their physician and risk serious harm. We found that more than one fourth of patients whose after-hours phone call was not forwarded to the on-call physician suffered ongoing pain and discomfort. We found that 3% suffered clinical harm, and 8% required an ED visit, new office visit, or medication change. We found that for most patients whose calls were not forwarded, there was no change in their status arising from the missed contact, and for most patients, there was no additional intervention needed beyond what would be expected from normal care. Although this study did not find any case of severe harm, the potential exists for serious harm and death as in the case of the patient who called with chest pain.

It appears from the high frequency of office visits within 1 week that many patients took it upon themselves to follow-up with an office visit. Short of a perfect after-hours clinical care system, patients may play an important role in assuring their

own well being by seeking care when their problem persists.[15] Although the ASIPS Project has created a working definition of clinical harm and nonclinical harm to patients, we believe it will be important in future studies to solicit from patients their own perceptions and definitions of harm.[14] It may be that discomfort, psychological distress, or financial impacts are significant forms of harm we did not adequately address with current coding approaches.

After-hours phone calls to physicians are handled in many different ways[13] depending on the size of the office, an urban versus rural practice, and whether or not an answering service is used. We found that a majority of practices in Denver used a similar system to the one reported here; that is, they ask the patient to determine whether their problem is an "emergency" requiring notification of the on-call physician.[13] We suspect that this system is prevalent in urban areas throughout the United States. The instructions given to the answering service personnel are crucial in determining who triages the patient's complaint. We hypothesize that as physicians began using an answering service, this standard language was added as a way of screening calls and making sure only really important calls were forwarded to the on-call physician. Over time it seems that this language has become a barrier to appropriate communication between patients and physicians.

One limitation of our study is the large number of patient charts no longer available for review. We believe this reflects the mobile nature of patients in today's medical climate. Many calls were made by patients who did not have an established relationship with the practice. We believe they may have had our office on their insurance card but never had an appointment, or they simply chose our office out of the telephone directory because we were close to their home. Other patients left the practice because they moved or were forced to change third party carriers due to company or employment changes. However, our focus was on describing the outcome for patients who continued in the practice and for whom we continued to provide medical care. We only had access to the records of care obtained in our residency-affiliated hospital. Patients may have received emergency care or hospitalization in other facilities; hence our findings are a conservative estimate of patient harm. We do not include a comparison group of patients whose calls were forwarded to the on-call physician. It may be that they also suffered ongoing pain and discomfort. However, their ongoing pain would have been due to some other issue and not directly related to the answering service triage system.

Medical providers may need to change their expectations when they think of medical errors and harm to patients.[16] The "6 Sigma" level accepted by other industries[17] (eg, the FAA and General Electric), view error rates of greater than 4 in a million as unacceptable. While we found only about 1% of the patients making an after-hours clinical call suffered harm or discomfort, this is a 2500-fold higher rate than is considered acceptable by other industries. When considering patients who experienced harm or additional pain and suffering, we believe that it is necessary to rethink what is an acceptable barrier to after-hours communication between patients and physicians.

This article confirms previous studies that found system problems in telephone triage. We propose that primary care offices remove barriers to patient-physician communication and forward all clinical calls to their on-call physician.

References

1. Fordyce J, Blank FS, Pekow P, et al. Errors in a busy emergency department. Ann Emerg Med 2003;42:324–33.
2. Barker KN, Flynn EA, Pepper GA, et al. Medication errors observed in 36 health care facilities. Arch Intern Med 2002;162:1897–903.
3. Leape LL, Bates DW, Cullen DJ, et al. System analysis of adverse drug events. JAMA 1995;274:35–43.
4. Bates DW, Cullen DJ, Laird N, et al. Incidence of adverse drug events and potential adverse drug events: implications for prevention. JAMA 1995;274:29–34.
5. Runciman WB, Edmonds MJ, Pradhan M. Setting priorities for patient safety. Qual Saf Health Care 2002;11:224–9.
6. Gandhi TK, Weingart SN, Borus J. Adverse drug events in ambulatory care. N Eng J Med 2003;348:1556–64.
7. Dovey SM, Meyers DS, Phillips RL, et al. A preliminary taxonomy of medical errors in family practice. Qual Saf Health Care 2002;11:233–8.
8. Elder NC, Dovey SM. Classification of medical errors and preventable adverse events in primary care: a synthesis of the literature. J Fam Pract 2002;51:927–32.
9. Pace WD, Staton EW, Higgins GS. Data base design to ensure anonymous study of medical errors: a

report from the ASIPS collaborative. J Am Med Inform Assoc 2003;10:531–40.

10. Victoroff MS. Dimensions of medical outcomes a taxonomy. Version 00-1204 ("Five Decimal Version"). 2000.
11. Hildebrandt DE, Westfall JM. Reasons for after-hours calls. J Fam Pract 2002;51:567–9.
12. Hildebrandt DE, Westfall JM, Nicholas RA, et al. Are frequent callers to family physicians high utilizers? Ann Fam Med 2004;2:546–8.
13. Hildebrandt DE, Westfall JM, Smith PC. After-hours telephone triage affects patient safety. J Fam Pract 2003;52:222–7.
14. Fernald DH, Pace WD, Harris DM, West DR, Main DS, Westfall JM. Event reporting to a primary care patient safety reporting system: a report from the ASIPS Collaborative. Ann Fam Med 2004;2: 327–32.
15. Weigart SN, Pagovich O, Sands DZ, et al. What can hospitalized patients tell us about adverse events? Learning from patient-reported incidents. J Gen Intern Med 2005;20:830–6.
16. Elder NC, Vonder Meulen M, and Cassedy A. The identification of medical errors by family physicians during outpatient visits. Ann Fam Med 2004;2:125–9.
17. Johnstone PA, Hendrickson JA, Dernbach AJ, et al. Ancillary services in the health care industry: Is six sigma reasonable? Qual Managm Health Care 2003; 12:53–63.