After-hours telephone triage affects patient safety

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Practice recommendations

- All clinical after-hours calls should be forwarded to the on-call physician, and no triage decisions should be made by the answering service or the patient, who may erroneously and dangerously delay medical care.
- Physicians in this study who reviewed the content of after-hours calls judged not to be emergencies said they would have wanted to talk to the patients in approximately half the cases. As only 10% of after-hours calls are judged nonemergencies, talking to all the after-hours clinical calls would result in only a small increase in the number of cases handled by the on-call physician.

Abstract

Objective To describe the management of after-hours calls to primary care physicians and identify potential errors that might delay evaluation and treatment.

Study Design Survey of primary care practices and audit of after-hours phone calls. Ninety-one primary care offices (family medicine, internal medicine, obstetrics, and pediatrics) were surveyed in October and November 2001. Data collected included number of persons answering the calls, information requested, instructions to patients, who decided whether to contact the on-call physician, and subsequent handling of all calls. We evaluated all after-hours calls to an index office that were not forwarded to the on-call physician. Four family physicians independently reviewed the calls while unaware that these calls had not been forwarded to the physician on call to determine the appropriate triage.

Population Primary care physicians and their telephone answering services.

Outcome Measures (1) Who decided to initiate immediate contact with the physician? (2) Percentage of calls identified as emergent or nonemergent by patients. (3) Independent physician ratings of nonemergent calls.

Results More than two thirds of the offices used answering services to take their calls. Ninety-three percent of the practices required *the patient* to decide whether the problem was emergent enough to require immediate notification of the on-call physician. Physician reviewers reported that 50% (range, 22%–77%) of the calls not forwarded to the on-call physician represented an emergency needing immediate contact with the physician.

Conclusions After-hours call systems in most primary care offices impose barriers that may delay care. All clinical patient calls should be sent to appropriately trained medical personnel for triage decisions. We urge all clinicians that use an answering service to examine their policies and procedures for possible sources of medical error.

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We found recently that about 10% of after-hours calls from patients were not forwarded by the answering service to the physician on call because the patient did not think the problem was an emergency.[1] In reviewing these calls, it became evident that many were indeed serious enough to require immediate contact with a medical professional.

The purpose of this study was to evaluate the management of after-hours phone calls made to primary care physicians' offices and their answering services in a large metropolitan area. General descriptions of after-hours calls have been reported,[2,3,4] and the management of these calls by professional and nurse triage services have been studied.[5,6] However, the management of telephone triage by answering services has not been examined. No published data exist on the number of after-hours phone calls to US physicians.

METHODS

This study had 2 components. In part 1, we surveyed 91 primary care offices (in family practice, internal medicine, obstetrics, and pediatrics) to determine how they handle after-hours phone calls. In part 2, we analyzed all calls from our previous study[1] that were not identified by the patient as an emergency and, hence, not forwarded to the on-call physician.

Survey of primary care physicians' answering services

The physicians in each specialty were identified in their respective section of the telephone book,[7] and, by using a systematic sampling technique, every fifth name was selected and surveyed. All surveys were completed in October and November 2001 after regular office hours, generally between 10:00 PM and 1:00 AM.

Using a structured survey interview form, the principal investigator indicated during each call that this was an anonymous research survey and asked if the answering service personnel could answer several questions. The information collected in each 3- to 5-minute interview included: whether there was a recorded message, whether the patient was instructed to call 911, who answered the call after the recorded message, what information was requested, who made the decision to initiate contact with the on-call physician, and what happened to calls that were not forwarded.

If the patient was instructed to choose an "option" from the medical office telephone system, this option was selected if it would lead to an answering service. If it offered to call or page the physician directly, then that survey was terminated. The name of the answering service was recorded to determine how many different services were used in this metropolitan area. We did not survey offices on how they managed the phone call reports received the next day or how they managed clinical calls during regular office hours.

Analysis of phone calls classified by patients as nonemergent

In our previous study,[1] we entered the chief complaint of all after-hours telephone calls made to our community-based family practice training program between April 2000 and March 2001 into an Access database program (Microsoft Access 97, Microsoft Corporation, Redmond, WA). These after-hours calls were routed to an answering service when the office was closed. Patients were asked by the answering service: "Is this an emergency?" Patients who were not certain were asked if they needed to speak directly with the physician. The calls were sent to the physician on call only if the patient stated to the answering service operator that the problem was an "emergency" or if they were uncertain and requested to speak directly with the physician.

For this study, we analyzed only the nonemergency calls that were not forwarded to a physician. We chose 4 local family physicians who were unaware of the purpose of the study to review these calls. We asked them to: "Indicate which of these complaints you want your after-hours answering service to forward to the physician on call and which can wait to be faxed to the office

Accepting all clinical calls has led to an average increase of only 1 or 2 more patient calls per night

the following morning." We analyzed their responses with descriptive statistics (SAS 8.0, SAS Institute, Cary, NC) and an overall multirater κ statistic (Magree macro 1.0, SAS Institute). The HealthOne Institutional Review Board approved this study.

RESULTS

Survey of primary care physicians' answering services

Table 1 presents the results of our survey of primary care physicians. Most physicians had a recorded message instructing the patient how to reach the physician after hours. In 4 cases, the message implied that the patient should not call unless that person had a "true emergency."

After calling 5 pediatricians, it became clear that the pediatricians used a single, well-described nurse triage service for managing after-hours calls,[5] and the pediatric offices were not included in further analysis. We have only partial data for 2 physicians because their answering service was too busy to complete the survey.

Fifty-six percent of the offices had recorded messages that instructed the caller to hang up and dial 911 if the problem was a "life-threatening" emergency. After the initial recorded message, 67% of the calls were answered by an answering service.

A full 93% of the answering services required the patient to decide whether to initiate contact with the on-call physician. Only those calls reported by the caller to be an "emergency" were forwarded to the on-call physician. In 2 cases, the answering service operator suggested to us that they were instructed to "use their judgment" in forwarding calls to the on-call physician. Five of the answering services commented that about 90% of the calls are forwarded to the physician and 10% are not forwarded, closely matching our previous findings.[1]

Ninety-five percent of the answering services faxed reports on all calls, including those not forwarded during the night, to the offices the following business day. Twelve answering services were used by the 91 practices in our study: 2 handled only family practice offices, 1 handled only internal medicine offices, 1 handled only obstetric offices, and 8 handled calls for multiple specialties.

Analysis of phone calls classified by patients as nonemergent

Over 1 year, 2835 clinical calls (eg, not administrative or appointment cancellations) were made to the office after hours, and 90% were considered to be an emergency and forwarded to the on-call physician. The remaining 10% (288 calls) were faxed to the office the next day. **Table 2** shows examples of those calls that were not forwarded. Our 4 physician reviewers of the nonemergency calls wanted to speak to the patient immediately at a mean of 50% of the calls rather than wait until the following business day (range, 22%%–77%, κ=.45).

DISCUSSION

In studying after-hours phone calls, we found several systematic barriers between patients and physicians: wrong numbers, messages necessitating a second phone call, and requirements that the patient decide whether the medical complaint was serious enough to initiate contact with the on-call physician. These barriers may negatively affect patient health due to unnecessary delays in evaluation and treatment.

Most patients asked to speak with the physician immediately about important clinical matters: medications, chest pain, contractions, or fever. However, some patients appeared unable to make appropriate triage decisions or persevere long enough to overcome the systematic barriers that prevented them from talking to a physician.

Our physician panel would have wanted to talk to the "no emergency" patients immediately in

TABLE 1

Telephone triage summary by specialty

		Values are percentage of *Yes* answers.		
	All specialties	**Family practice offices**	**Internal medicine offices**	**Obstretric/ gynecolgic offices**
PART 1: ALL SURVEYS	**n=86**	**n=34**	**n=26**	**n=26**
Is there a recorded message?	84	85	85	81
If an emergency, patient to call "911"?	56	72	58	35
After recorded message, who answers?				
Answering service	67	56	65	88
Nurse	0	0	0	0
Physician (called or paged directly)	21	35	23	0
No answer/wrong number	12	9	12	12
Ease of access				
Call 1 telephone number	34	38	42	23
Call a second number	16	18	23	8
Press telephone option number	38	35	23	57
No answer/wrong number	12	9	12	12
PART 2: ANSWERING SERVICES	**n=59**	**n=19**	**n=17**	**n=23**
What information is requested?				
Caller's name	100	100	100	100
Patient's name	100	100	100	100
Age	52*	83*	41*	35
Sex	29*	39*	24*	26
Pregnancy status	76*	95*	70	96
Nature of complaint	100	100	100	100
Who makes decision to contact physician?				
Patient	93	83	94	100
Answering service	5	11	6	0
Unknown	2	6		
What happens to nonemergency calls?				
Faxed to office next day	95	83	100	100
Held for office to call	5	17	0	0

*Includes yes and sometimes responses.

TABLE 2

Sample of calls classified as nonemergent by patients

Obstetrics
41-week obstetric, leaking fluid
34-week obstetric, contractions
6-month obstetric, bad cold and side pains
Cardiopulmonary
Pain in chest and going down left arm
Chest pain, hard time breathing in
Had heart operation, needs to be seen
Trauma
Has multiple sclerosis, severe vertigo, fell and hit her head
Was in motor vehicle accident, please call
Cut hand last night, still bleeding in morning
Medications
Has flu, what can she take because of hepatitis?
Lost his inhaler, please call
Prescription making patient throw up every time he eats
Pediatric
1 week old, vomiting, crying
6 year old, sore throat, wheezy, fever, diarrhea, not sleeping
Miscellaneous
Needs to talk to doctor ASAP, says it's very important
Please call ASAP, it's personal
Vomiting due to liver scans

approximately half the cases. If 10% of 50 million to 100 million after-hours phone calls each year in the United States are not forwarded to the physician because the caller feels the complaint is not emergent, and if half those calls are potentially serious, there may be as many as 2.5 million to 5 million potentially dangerous delays in care each year.

We cannot expect an answering service operator or a parent to know how to triage an infant with a fever when physicians disagree on appropriate disposition.[8] New parents with a sick infant, an older patient with chest pain, or a woman having preterm contractions during her first pregnancy might be uncertain as to what constitutes an "emergency."

Solutions

Several solutions to this problem exist. We made a change in our office and now have all clinical calls forwarded to the on-call physician. No triage decisions are made by the patient or the answering service. This has led to an average increase of only 1 to 2 more patient calls per night. Offices also could become part of a citywide network in which all calls are managed by a trained nursing staff, as the pediatricians have done in Denver, Colorado.[5]

Interpretations

This study should be interpreted in light of several limitations. First, it was conducted in 1 metropolitan region. It is possible that other regions of the US have different mechanisms or standards for handling after-hours calls. However, given the overwhelming number of offices in our study that required patients to make their own triage decisions, we believe this barrier is likely widespread.

Second, the answering services we surveyed knew we were not patients, and this may have affected their answers. However, even if only 10% of these calls were not forwarded to the physician on call, a significant number of calls might have been unnecessarily delayed and potentially put patients at risk.

The Institute of Medicine's report on medical errors states: "Errors can be prevented by designing systems that make it hard for people to do the wrong thing and easy for people to do the right thing."[9] Errors in triage by the patient or the answering service may lead to dangerous delays in necessary patient care.

Our future research will focus on identifying adverse outcomes in this study population and prospectively in a practice-based research network. When a patient calls the primary care office after hours, the decisions should be simple and left to those who have the training to make those decisions based on their best medical judgment. We strongly urge all clinicians who use an answering service to examine their policies and procedures for potential sources of medical error.

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Commentary

Patient safety after hours: Time for action

▶ *About: "After-hours telephone triage affects patient safety," pages 222–227*

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Will all of you who enjoy taking after-hours calls please stand up?

What? Everyone is still sitting? That's what I thought. Although taking calls after hours is not one of our favorite duties, after-hours care is a crucial component of primary health care. The recent Institute of Medicine report, *Crossing the Quality Chasm*,[1] cited 6 characteristics essential for a high-quality health care system for the 21st century:

- safe
- effective
- efficient
- equitable
- timely
- patient-centered.

After-hours call coverage systems should pass muster on all 6 qualities. Do they?

TELEPHONE TRIAGE AFTER HOURS NOT UP TO STANDARD

Hildebrandt, Westfall, and Smith provide evidence that the after-hours primary care call systems in the United States are not up to standard.[2] They investigated call coverage systems of 91 primary care practices in the Denver area by phoning the office numbers, following the recorded instructions, and asking how calls were managed when they spoke to a live person. More than two

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thirds of the offices used answering services to triage calls, and 93% of these required patients to decide whether the condition was serious enough to warrant contacting the physician on call (this is correct!).

I suppose one could call this approach "patient-centered," but I suspect this strategy is more to lessen the burden of the on-call physician rather than to promote safe and effective patient-centered care.

The investigators then reviewed reports of all calls not forwarded to the physician on call from 1 of these 91 practices. (A list of calls not forwarded to the physician on call is routinely forwarded to the office the next day by fax.) The physician reviewers in this study judged 50% of these calls to be potentially serious; the patients should have been referred immediately to the physician on call. Clearly, our patients are not making good decisions about the potentially serious nature of their complaints.

To be fair, only 10% of all calls were not forwarded to the on-call physician. Further, the researchers did not investigate each case to determine whether the delay in contact resulted in any untoward events that might have been prevented by immediate referral to the on-call doctor. Perhaps all of the patients needing immediate attention found appropriate care on their own by going to an emergency department or urgent care center. Further research is needed to explore the extent to which medical errors related to after-hours call procedures contribute to adverse patient outcomes.

The Institute of Medicine's report, *To Err is Human,* reminds us that the best way to prevent errors is by improving care systems rather than by attributing personal blame.[3] If systems are inadequate for the job, then even the best-intentioned practitioner will provide suboptimal care. Hildebrandt and associates spotted a weakness in the system, a latent error that is easily correctable.

SOLUTIONS

What is the solution? I agree with the authors: all after-hours calls for clinical questions should be referred in a timely manner to a clinician. The clinician may be a physician, a physician assistant, or a nurse practitioner. After-hours call systems should be monitored periodically to ensure the systems are safe, effective, efficient, equitable, timely, and patient-centered. Patient complaints about suboptimal after-hours care should be investigated promptly. Continuous quality improvement principles should be applied to assess and improve after-hours care systems, just as we use them to improve office care.

I see no reason to wait. Check out your own after-hours coverage system today to ensure that all clinical calls reach the attention of a competent clinician as soon as possible. You might get another call or two each night you are on call, but I believe the gain will be worth the pain.

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