

# Physician E-mail and Telephone Contact After Emergency Department Visit Improves Patient Satisfaction: A Crossover Trial

Pankaj B. Patel, MD; David R. Vinson, MD

**Study objective:** Enhancing emergency department (ED) patient satisfaction has wide-ranging benefits. We seek to determine how postvisit patient-physician contact by e-mail or telephone affects patients' satisfaction with their emergency physician.

**Methods:** We undertook this crossover study from May 1, 2010, to June 30, 2010, at 2 community EDs. Forty-two physicians either e-mailed or telephoned their patients within 72 hours of the ED visit for 1 month; in the alternate month, they provided no contact, serving as their own controls. Patients received satisfaction surveys after their ED visit. Patient satisfaction is reported as a percentage of those responding very good or excellent on a 5-point Likert scale for 3 questions about their emergency physician's skills, care, and communication. We calculated differences between patient groups (noncontact versus contact) using an intention-to-treat analysis.

**Results:** The mean patient satisfaction score was 79.4% for the 1,002 patients in the noncontact group and 87.7% for the 348 patients in the contact group (difference 8.3%; 95% confidence interval 4.0% to 12.6%). Patient satisfaction scores were similar for e-mail and telephone contact: 89.3% for the e-mail group and 85.2% for the telephone group (difference 4.1%; 95% confidence interval -2.3% to 10.5%).

**Conclusion:** Patient satisfaction was higher when emergency physicians contacted patients briefly after their visit, either by e-mail or by telephone. Higher patient satisfaction was observed equally among patients contacted by e-mail and those contacted by telephone. Postvisit patient-physician contact could be a valuable practice to improve ED patient satisfaction. [Ann Emerg Med. 2013;xx:xxx.]

Please see page XX for the Editor's Capsule Summary of this article.

0196-0644/\$-see front matter

Copyright © 2013 by the American College of Emergency Physicians.

<http://dx.doi.org/10.1016/j.annemergmed.2012.12.005>

## INTRODUCTION

Enhancing the care experience for emergency department (ED) patients has wide-ranging benefits. These include increased patient compliance and response to treatment, reduced malpractice risk, improved customer retention, favorable word-of-mouth advertising, more effective continuity of care, reduced need for follow-up visits, and higher staff morale.<sup>1-4</sup> Elements of the ED experience that strongly correlate with patient satisfaction are timeliness of care, empathy, technical competence, information dispensation, and pain management.<sup>5</sup> Other research suggests that the most important predictors of patient satisfaction are the quality of the interpersonal interaction, attitudinal skills of staff, and the decent treatment of patients.<sup>6-8</sup>

A patient's impression of his or her ED care does not have to end with discharge from the department. Recent reports suggest that a callback system can be a tool of service excellence that enhances ED patient satisfaction.<sup>5,7</sup> Although scheduling follow-up with the patient's primary care physician before ED discharge improves patient satisfaction,<sup>9</sup> studies have demonstrated that posthospitalization telephone contact can

also improve it,<sup>3,4,10,11</sup> though the effect of post-ED telephone contact by the treating emergency physician on patient satisfaction has not been described, to our knowledge. Additionally, telephone follow-up by health care providers has been shown to improve compliance with medical treatment, increase health education for patients, improve compliance with primary care follow-up, reduce readmission rates, help prevent adverse events, and, in older patients, reduce inappropriate return visits to the ED.<sup>3,10,12-14</sup> Given that emergency care is generally more rushed than inpatient care, the ED patient might have even more to gain from timely postvisit telephone contact with a health care provider.

E-mail is another attractive means by which to provide patient follow-up and can transform the relationship between patients and providers.<sup>15</sup> It not only allows physicians and staff to provide valuable postvisit information but also may serve as a vehicle for emotional support to the patient.<sup>16</sup> Though e-mail use in the ambulatory care setting appears to be low,<sup>17</sup> surveys indicate that physician and patient users are highly satisfied with e-mail correspondence and that nonusers are willing to try e-mail communication between patient and provider.<sup>18-20</sup>

**Editor's Capsule Summary***What is already known on this topic*

Postvisit outreach can enhance patients' reported satisfaction with inpatient and clinic care. Its effect on satisfaction with emergency department care has not been evaluated.

*What question this study addressed*

This crossover study of 42 community emergency physicians contacting 208 patients by e-mail, contacting 140 by telephone, and not contacting 1,002 control patients examined whether satisfaction was affected by contact and, if so, by the method of contact.

*What this study adds to our knowledge*

Contacted patients had higher satisfaction scores (88% versus 79%), with no statistically significant difference in satisfaction scores between those in the e-mail group (89%) and those in the telephone group (85%).

*How this is relevant to clinical practice*

This study provides evidence that postvisit contact increases reported satisfaction. Whether this translates into improved patient outcomes and whether the benefits of these programs justify their cost remain unknown.

Telephone follow-up for elderly patients improves overall quality of care,<sup>14</sup> and even older patients seem enthusiastic about trying e-mail as a communication tool with their provider.<sup>21</sup> The potential for improving follow-up communication with elderly ED patients is particularly important because the elderly population is predicted to grow exponentially in the next few decades.<sup>22</sup>

In the ED, in which we have limited continuity with our patients, higher patient satisfaction is linked with better patient compliance, a reduced risk management profile with fewer malpractice claims, and higher staff satisfaction that translates into lower staff turnover.<sup>23</sup> It behooves EDs to identify opportunities to improve continuity of care with our patients and opportunities to improve patient satisfaction.

Though postvisit ED patient contact by health care providers is associated with improved patient communication and compliance,<sup>13,24-27</sup> the direct effect of this contact on patient satisfaction is unknown. For a number of years before the study period, the investigators and several ED colleagues had been contacting patients by telephone or e-mail within a few days of their ED visit. Our anecdotal experience was that this communication was greatly appreciated by the patients, which then generated our hypothesis that timely postvisit contact by

**Table 1.** ED monthly variables.

Variables	First Month: May 2010	Second Month: June 2010	Monthly Means: 2010
<b>Physician assignments</b>			
<b>Group 1 (n=21)</b>			
E-mail contact	14	0	NA
Telephone contact	7	0	NA
<b>Group 2 (n=21)</b>			
E-mail contact	0	12	NA
Telephone contact	0	9	NA
<b>Department variables*</b>			
Census	13,071	12,457	12,358
Nonmembers (%)	2,567 (19.6)	2,648 (21.3)	2,570 (20.8)
Hospital admissions (%)	1,768 (13.4)	1,700 (13.6)	1,745 (14.1)
Boarding of admitted patients, h	671	1,061	1,108
Ambulance diversion, h	1	0	1.1
Mean length of stay, all patients, min	199	202	207

NA, Not applicable.

\*We report here the sum of the 2 affiliated community EDs.

treating emergency physicians would improve patients' satisfaction with their recent ED experience. We undertook this crossover trial within 2 EDs of a large integrated health care delivery system, using an established patient satisfaction survey process. We sought to determine whether e-mail and telephone post-ED visit physician contact had differential effects on patient satisfaction.

**MATERIALS AND METHODS****Study Design**

A crossover design was selected to allow participating physicians to serve as their own controls. We randomly assigned participating physicians to one of 2 groups by a simple coin toss. Group 1 physicians would contact all of their eligible ED patients during the first month but not the second month. Group 2 physicians would contact all of their eligible patients during the second month but not the first month (Table 1). Assigning half of the intervention to one month and the other half to the other month would attenuate month-to-month temporal differences that might occur in the acuity, volume, composition, and flow of the ED patient population. No other performance improvement or patient throughput initiatives were undertaken in either ED during the study period.

**Setting**

We conducted a crossover study from May 1, 2010, to June 30, 2010, at 2 neighboring community hospitals within Kaiser Permanente (KP) Northern California, a large integrated health care delivery system serving approximately 3.3 million members at 21 hospitals and more than 160 medical offices. Both EDs are staffed by 1 group of residency-trained, board-certified or board-prepared emergency physicians and provide care to a broad spectrum of patients that includes pediatric and obstetric patients.

Each ED has an annual census of approximately 74,000 patients and neither is a designated trauma center. Our institutional review board reviewed this study and granted it an exemption.

### Selection of Participants

Seventy-six emergency physicians provided coverage for the 2 study hospitals during the study period, all of whom were invited to participate in the study. Forty-two emergency physicians (55%) volunteered to participate by either calling or e-mailing patients they had managed within 72 hours of the patient visit. Twenty-six of these physicians selected the e-mail option; 16 physicians selected the telephone option.

The randomly assigned groups each contained 21 physicians (Table 1). Group 1 was composed of 14 physicians providing e-mail contact and 7 physicians providing telephone contact during the first month. Group 2 included 12 physicians who provided e-mail contact and 9 physicians who provided telephone contact during the second month. Physicians in the study used standardized templates for e-mail and telephone contact that were developed by the coauthors.

The shift distribution of the participating physicians was measured to include both the number of shifts in the ED itself and the number of shifts in the rapid care section of the ED, where patients with lower-acuity complaints are treated expeditiously.

ED patients were included in the study if they were treated by a participating physician during the study period, received a randomly assigned patient satisfaction survey according to standard criteria used by our medical group (see below), and returned a completed survey. Study patients from this larger cohort were then included in a smaller contact group if they also had an appropriate means of being contacted by their physician (either a working telephone or a secure KP.org e-mail account) and were in fact contacted by their physician. The age, sex, and race/ethnicity of all patient responders in the contact and noncontact groups were obtained from KP's administrative databases.

At the time of patient care, physicians were blind to which of their patients would receive a satisfaction survey and which of them would complete and return it. E-mail contact was conducted only with patients enrolled in the KP-managed secure messaging program through KP.org because that ensured secure and Health Insurance Portability and Accountability Act (HIPAA)-compliant communication between the emergency physician and the patient/caretaker.<sup>28</sup> Approximately 40% of our health plan members were enrolled in the secure messaging program at the time of the study.

To describe the acuity, flow, and composition of the ED patients treated in our 2 study EDs, we measured the following variables for each study month: census, number of Kaiser Foundation Health Plan nonmembers, number of hospital admissions, boarding hours of admitted patients, ambulance diversion hours, and mean length of stay.

The patient survey used in this study was not specifically crafted for this project. The survey was designed, developed, distributed, and analyzed by the Permanente Medical Group

Department of Access and Service Assessment. This department has monitored patient satisfaction across the KP Northern California region since 1994. In 2010, the department sent out 1.95 million surveys, 175,000 of which were specifically for patients who had been treated in one of the 21 KP Northern California EDs. The response rate for ED patients in 2010 was 25.4%. Surveys are distributed to patients by e-mail or regular postal service within 72 hours of their visit. Emergency patients who are either discharged home from the ED or admitted to the hospital are eligible. Kaiser Foundation Health Plan members and nonmembers are also equally eligible. Patients are randomly assigned to receive a survey if they meet defined eligibility criteria: the patient has not been surveyed (1) in the previous 4 months and (2) for the same physician in the previous 12 months. Selection of ED patients for survey reception was undertaken independently of the ED study. Patient responses to 3 physician-specific satisfaction questions were evaluated to determine the effect of postvisit contact by the emergency physician on the patient's assessment of that physician.

### Outcome Measures

Patients were asked to rate the following physician-specific variables: (1) the physician's skills and ability; (2) the patient's confidence that the physician provided the care and services the medical condition required; (3) how well the physician listened and explained what was being done and why. These survey items were rated with a 5-point Likert scale: poor, fair, good, very good, and excellent. The primary outcome measure was the mean percentage answering very good or excellent on these 3 physician-specific items. Satisfaction scores are reported for each item individually and as a mean of the 3 items collectively. Additionally, participating physicians were asked at the end of the study period to estimate the amount of time that was required for the postvisit contact, including documentation.

### Primary Data Analysis

We calculated the mean difference between the patient contact groups by using a regression with the standard errors adjusted for the clustering of visits within physicians (using Stata [version 10; StataCorp, College Station, TX], regress command with cluster option) and presented the mean difference with 95% confidence intervals (CIs).

## RESULTS

The 42 participating physicians were representative of our entire emergency medicine group with regard to age (mean 45 years), sex (64% men), and years with the medical group (mean 9.5 years). The participating physicians treated 11,844 patients from May 1, 2010, through June 30, 2010. Satisfaction surveys were randomly sent to 6,478 patients (54.7%), with 1,468 patients (22.6%) returning a completed survey. Of these 1,468 patients, 1,350 (92.0%) responded to the specific satisfaction questions for this study (Figure 1). The response rate of our 2 study EDs is consistent with that throughout KP Northern

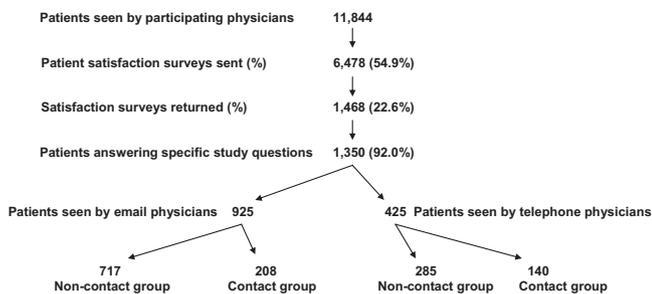


Figure 1. Flow diagram for study patients.

Table 2. Study group patient demographics.

Demographics	Number of Patients	Median Age, Years	Interquartile Range, Years	Number of Women (%)
Overall study group	1,350	59	32–74	725 (54)
Noncontact group	1,002	58	35–75	526 (53)
Contact group	348	59	39–72	199 (57)
E-mail group	925	58	32–74	500 (54)
Telephone group	425	59	34–74	225 (53)

California. Age, sex, and race/ethnicity were similar among contacted patients compared with noncontacted patients, as well as among patients treated by e-mail physicians compared with those treated by telephone physicians (Table 2).

Study physicians were asked to contact all eligible patients they had treated during their randomly assigned contact month. More than 95% of eligible patients were contacted by the e-mailing physicians, whereas 86% of patients treated by the telephone physicians were contacted. Patients within these groups who were not contacted were retained in the contact groups for analysis.

The mean patient satisfaction score was 79.4% for the 1,002 patients in the noncontact group and 87.7% for the 348 patients in the contact group (difference 8.3%; 95% CI 4.0% to 12.6%) (Table 3). Overall patient satisfaction was 89.3% for the 208 patients in the e-mail group and 85.2% for the 140 patients in the telephone group (difference 4.1%; 95% CI –2.3% to 10.5%).

Thirty-nine of the 42 participating physicians had satisfaction scores completed and returned by their patients during both the noncontact and contact months, allowing a graphic physician-specific comparison between months. Noncontact and contact mean patient satisfaction scores per physician are reported in Figure 2, in which the red line indicates the mean patient satisfaction scores during the physicians' noncontact months and the blue lines indicate patient satisfaction scores during the physicians' contact months.

Monthly ED variables are shown in Table 1. Participating physicians worked a schedule comparable to that of nonparticipating physicians and covered a similar proportion of rapid care shifts for lower-acuity patients (approximately 20% of all ED patients were managed in the rapid care section of our EDs). Schedules of participating physicians during the noncontact and

Table 3. Patient satisfaction with recent ED visit with or without postvisit contact by the treating physician by telephone or e-mail.\*

Survey Item	Noncontact Group, N=1,002	Contact Group, N=348	Difference	95% CI
1. Physician skills/ability	81.5	90.6	9.1	5.5–12.8
2. Confidence in care physician provided	79.3	88.7	9.4	4.8–13.9
3. Physician listened/explained	79.2	85.8	6.6	1.7–11.5
Overall mean of all 3 items	79.4	87.7	8.3	4.0–12.6

\*Satisfaction reported as the mean percentage of patients responding either very good or excellent on a 5-point Likert scale: poor, fair, good, very good, and excellent (among nonmissing responses).

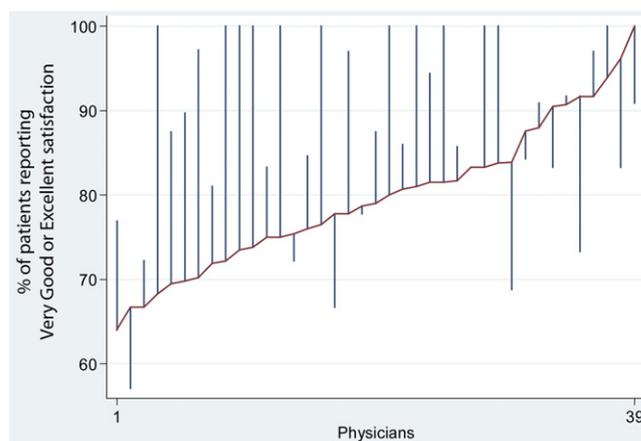


Figure 2. Note: For each study physician, this figure shows the mean patient satisfaction scores for noncontact and contact visits. The study physicians are shown in order by their mean noncontact patient satisfaction score. This noncontact satisfaction score is plotted on the sloping red line. For each physician, the other end of the vertical line represents the mean patient satisfaction score among visits with contact (by e-mail or by telephone). The vertical line itself represents the difference between each physician's noncontact and contact patient satisfaction score.

Physician-patient satisfaction scores: noncontact versus contact.

contact months also were comparable. During all ED shifts, patients were assigned to physicians by a computerized team assignment system.<sup>29</sup> This assignment of patients was blind to whether or not the physician was involved in the study.

Physicians reported that postvisit patient contact took approximately 2.2 minutes for each e-mail contact and 3.6 minutes for each telephone contact, including documentation.

LIMITATIONS

There was a disparity between the overall numbers of patients who responded to the patient satisfaction survey in the

noncontact versus contact groups (1,002 versus 348). The difference between the e-mail group (925 patients) and the telephone group (425 patients) is explained by the greater number of physicians communicating with their patients by e-mail (26; 62%) than by telephone (16; 38%). The smaller proportion of patients in the contact group (348; 26%) compared with the noncontact group (1,002; 74%) is accounted for in part by the smaller proportion of patients who were eligible for e-mail contact during the contact month because they would have to be both members of the health plan (approximately 80% of ED patients) and enrolled in the KP.org secure messaging program (approximately 40% of members). During the noncontact month, neither membership nor KP.org secure messaging participation was a limiting factor. We are unable to explain the size disparity between the noncontact (285 patients) versus contact (140 patients) telephone groups unless patients who had communicated their satisfaction with their physician during the postvisit contact believed that completing the subsequent official patient satisfaction survey was redundant and thus unnecessary.

Though postvisit patient contact was shown to have a favorable effect on patient satisfaction scores, the size of the effect cannot be stated within more narrow parameters, as noted by the relatively wide 95% CIs, because of the small sample size of this study. However, the lower end of our estimated effect size is 4 percentage points, which still is a worthwhile improvement in the patient satisfaction score. The sample size also impeded our ability to further analyze the e-mail and telephone groups.

The time requirements of both e-mail and telephone contact were estimates reported by the physicians. No objective measurements were made. We did not report the day of the week or hour of the day of the patient visit, variables that are known to influence patient satisfaction scores.<sup>7</sup> However, the crossover design, in which the physicians served as their own controls, and the balanced shift distribution between months would have minimized any imbalance in these temporal variables between the noncontact and the contact month.

The patient satisfaction items we used were those already in operation within our health care system and may not readily map to questions used by other surveys, eg, Press Ganey. We studied the effects only of patient-physician contact. We cannot speak to the effects of postvisit contact on patient satisfaction when performed by other members of the health care team, such as nurses or administrators. We did not analyze the effect that postvisit contact by emergency physicians had on the overall satisfaction of patients with their entire ED experience.

The ability to generalize our results is limited by the 2-center setting of the study. Our patient population accurately reflects the demographics of Northern California but not necessarily other populations. Another limitation on generalizability is the lack of secure e-mail availability between physicians and their patients in other settings. But this is less of a shortcoming, given that telephone contact is just as effective as e-mail at improving

patient satisfaction scores. Excluding the homeless, telephone access is nearly ubiquitous. The National Center for Health Statistics reported in 2011 that 98% of households in the United States have either a land line or a wireless telephone.<sup>30</sup>

## DISCUSSION

We found that ED patient satisfaction was higher for patients who received either a postvisit e-mail or telephone call from their treating emergency physician. Higher patient satisfaction was observed equally among patients contacted by e-mail and those contacted by telephone. Physicians thought that e-mail contact was less time consuming.

The connection between postvisit telephone follow-up and patient satisfaction has been studied for patients discharged from the inpatient hospital. Multiple studies have shown that telephone follow-up is an effective tool to improve patient satisfaction and overall patient care.<sup>1,3,4,10,12,13,31</sup> Our study similarly showed significant improvement in patient satisfaction for patients who received postvisit telephone contact by their treating emergency physician.

The use of Internet and e-mail technology for follow-up is widely endorsed as an attractive alternative to telephone follow-up.<sup>15,16,18-20,32</sup> Various studies indicate a preference for telephone follow-up over e-mail follow-up because of faster response time and a perception that e-mails might be more likely to lead to miscommunication compared with telephone calls.<sup>24,26,33</sup> However, as technology continues to evolve and as our study demonstrates, e-mail communication may emerge as the favored mode of follow-up, especially in the setting of the irregular hours worked by emergency physicians. E-mail communication is thought to be more efficient<sup>30</sup> and can quickly provide valuable information and emotional support to patients while offering an opportunity for further communication between patients and their emergency physicians. Although telephone follow-up for ED visits has been well described<sup>13,25,27,34</sup> and a comparison of response times for telephone follow-up versus e-mail follow-up for ED patients has been studied,<sup>24,26</sup> we believe that our study is the first to measure the effect of postvisit e-mail contact on ED patient satisfaction. Furthermore, our findings indicate no significant difference in patient satisfaction between postvisit e-mail and telephone contact, allowing physicians to select either modality with the assurance of equal gains in patient satisfaction ratings. Our health care organization has enabled secure, HIPAA-compliant e-mail contact with patients, providing our emergency physicians a unique opportunity to perform this kind of study.<sup>28</sup> However, not all EDs may be able to undertake secure e-mail contact, thus limiting them only to postvisit telephone contact. The Centers for Medicare & Medicaid Services has considered making secure messaging one of the stage 2 criteria that eligible professionals, eligible hospitals, and critical access hospitals must meet to qualify for Medicare or Medicaid electronic health record incentive payments.<sup>35</sup>

Though the use of virtual outreach technology such as e-mail is embraced by patients,<sup>15,16,21,36</sup> some logistic hurdles must be

overcome for EDs to routinely provide e-mail or telephone follow-up. One obstacle to an effective follow-up system is the accuracy of the contact information. Telephone numbers given at registration have been found to be inaccurate.<sup>37</sup> However, simply verifying the best contact number on discharge can significantly increase accuracy.<sup>25,34,38</sup> Verification of telephone contact information has been an established protocol in our KP EDs for many years, resulting in highly reliable contact information. Our ED registration and discharge personnel are very good about confirming contact information at each visit to ensure that the demographic data we have on file are accurate and up-to-date. Other EDs, with quite different patient populations than ours, have also had high contact success rates with their varied postvisit telephone follow-up programs.<sup>24,26,27,38-41</sup> The prevalence of telephone access among US households<sup>30</sup> in combination with established ED measures to ensure accuracy of telephone numbers buttresses the generalizability and external validity of our results. The same steps can be taken to ensure e-mail address accuracy.

The development of guidelines for providing postvisit follow-up has been recommended.<sup>42</sup> However, a large survey of Florida physicians found that there was little adherence to recognized e-mail correspondence guidelines.<sup>17</sup> To proactively address this issue for our study, standardized e-mail and telephone templates were developed for our participating physicians to use.

Most studies in the literature describe postvisit patient contact that is provided by nonphysician staff.<sup>3,10-12,14,25,31</sup> Studies in which physicians make postvisit contact have not measured the effect on patient satisfaction.<sup>13</sup> In our study of patient satisfaction, emergency physicians provided postvisit contact with their own patients. This was critical to the study design because we were measuring the effect of patient-physician contact on patients' opinion of their treating physician. One advantage of having the treating physician provide postvisit patient contact is that the e-mail message or telephone call can be appreciated as a continuation of the care the physician recently provided in the ED. The contact then may serve as the capstone that completes the emergency physician's engagement with the patient. This brief postvisit contact at a time and place apart from the chaos and stress of the ED might provide for the patient a clearer lens through which the previous ED experience is viewed and might explain in part why a brief conversation can significantly improve the patient's impression of the emergency physician's skills, care, and communication.

Improved patient satisfaction is known to correlate with higher staff satisfaction.<sup>23</sup> We believe that the development of a postvisit contact system for ED patients provides an excellent opportunity for improved patient satisfaction, as well as physician satisfaction. This type of program could be modified and expanded in such a way that other health care benefits could ensue, including improved health education, patient

compliance, and communications, as well as a reduction in return visits to the ED, adverse events, and readmission rates.

Patient satisfaction was higher when emergency physicians made brief postvisit contact with their patients either by e-mail or telephone. Postvisit patient-physician contact might serve as a valuable addition to standard measures to improve ED patient satisfaction.

*The authors acknowledge the assistance and expertise of Kristen Gregory, PhD, director of Patient Satisfaction Assessment, The Permanente Medical Group (TPMG), who provided the patient satisfaction data for this study; Ke Xu, MS, TPMG Access and Service Assessment, Patient Satisfaction Assessment, for data analysis; Mary E. Reed, DrPH, and Jie Huang, PhD, statistical demographer, Kaiser Permanente Division of Research, for the statistical analysis; the 42 physicians from the Sacramento and Roseville Kaiser Permanente EDs who volunteered their time to participate in the study; and our ED chiefs who have given their strong support for this study.*

*Supervising editor:* David L. Schriger, MD, MPH

*Author affiliations:* From the Department of Emergency Medicine, The Permanente Medical Group, Kaiser Permanente Medical Centers, Sacramento and Roseville, CA.

*Author contributions:* PBP conceived the study and DRV designed it. Both authors acquired and interpreted the data and drafted and critically revised the article. PBP takes responsibility for the paper as a whole.

*Funding and support:* By *Annals* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (see [www.icmje.org](http://www.icmje.org)). The authors have stated that no such relationships exist.

*Publication dates:* Received for publication October 24, 2011. Revisions received February 17, 2012; August 24, 2012; and November 18, 2012. Accepted for publication November 27, 2012.

Presented in part at the *Research Forum* for the ACEP *Scientific Assembly*, October 2011, San Francisco, CA.

*Address for correspondence:* Pankaj B. Patel, MD, E-mail [pankaj.patel@kp.org](mailto:pankaj.patel@kp.org).

## REFERENCES

1. Balas EA, Jaffrey F, Kuperman GJ, et al. Electronic communication with patients. Evaluation of distance medicine technology. *JAMA*. 1997;278:152-159.
2. Bergmo TS, Kummervold PE, Gammon D, et al. Electronic patient-provider communication: will it offset office visits and telephone consultations in primary care? *Int J Med Inform*. 2005;74:705-710.
3. Setia N, Meade C. Bundling the value of discharge telephone calls and leader rounding. *J Nurs Adm*. 2009;39:138-141.
4. Worthington K. Customer satisfaction in the emergency department. *Emerg Med Clin North Am*. 2004;22:87-102.

5. Welch SJ. Twenty years of patient satisfaction research applied to the emergency department: a qualitative review. *Am J Med Qual.* 2010;25:64-72.
6. Boudreaux ED, O'Hea EL. Patient satisfaction in the emergency department: a review of the literature and implications for practice. *J Emerg Med.* 2004;26:13-26.
7. Press Ganey Associates. *Emergency Department Pulse Report 2010 Patient Perspectives on American Health Care.* South Bend, IN. Available at: <http://www.pressganey.com/researchresources/hospitals/emergencyDepartment/emergencyPulsereport.aspx>. Accessed November 18, 2012.
8. Taylor C, Bengler JR. Patient satisfaction in emergency medicine. *Emerg Med J.* 2004;21:528-532.
9. Vinson DR, Patel PB. Facilitating follow-up after emergency care using an appointment assignment system. *J Healthc Qual.* 2009;31:18-24.
10. Braun E, Baidusi A, Alroy G, et al. Telephone follow-up improves patient satisfaction following hospital discharge. *Eur J Int Med.* 2009;20:221-225.
11. Dudas V, Bookwalter T, Kerr KM, et al. The impact of follow-up telephone calls to patients after hospitalization. *Am J Med.* 2001;111:26S-30S.
12. Bostrom J, Caldwell J, McGuire K, et al. Telephone follow-up after discharge from the hospital: does it make a difference? *Appl Nurs Res.* 1996;9:47-52.
13. Chande VT, Exum V. Follow-up phone calls after an emergency department visit. *Pediatrics.* 1994;93:513-514.
14. Poncia HDM, Ryan J, Carver M. Next day telephone follow up of the elderly: a needs assessment and critical incident monitoring tool for the accident and emergency department. *J Accid Emerg Med.* 2000;17:337-340.
15. Ye J, Rust G, Fry-Johnson Y, et al. E-mail patient-provider communication: a systematic review. *Patient Educ Couns.* 2010;80:266-273.
16. Roter DL, Larson S, Sands DZ, et al. Can e-mail messages between patients and physicians be patient-centered? *Health Commun.* 2008;23:80-86.
17. Brooks RG, Menachemi N. Physicians' use of email with patients: factors influencing electronic communication and adherence to best practices. *J Med Internet Res.* 2006;8:e2.
18. Gaster B, Knight CL, DeWitt DE, et al. Physicians' use of and attitudes toward electronic mail for patient communication. *J Gen Intern Med.* 2003;18:385-389.
19. Mark KE, Wald A, Drolete L, et al. Internet and email use among STD clinic patients. *Sex Transm Dis.* 2008;35:960-965.
20. Moyer CA, Stern DT, Dobias KS, et al. Bridging the electronic divide: patient and provider perspectives on e-mail communication in primary care. *Am J Manag Care.* 2002;8:427-433.
21. Singh H, Fox SA, Petersen NJ, et al. Older patients' enthusiasm to use electronic mail to communicate with their physicians: cross-sectional survey. *J Med Internet Res.* 2009;11:e18.
22. He W, Sengupta M, Velkoff VA, et al. *US Census Bureau, Current Population Reports, P23-209, 65+ in the United States.* Washington, DC: US Government Printing Office; 2005.
23. Welch SJ, Hellstern RA, Jensen K, et al. Can't get no satisfaction? the real truth behind patient satisfaction surveys. *Emerg Med News.* 2010;32:606-607, 626.
24. Ezenkwele UA, Sites FD, Shofer FS, et al. A randomized study of electronic versus telephone follow-up after emergency department visit. *J Emerg Med.* 2003;24:125-130.
25. Ferrigno RF, Bradley K, Werdmann MJ. A simple strategy for improving patient contact after ED discharge. *Am J Emerg Med.* 2001;19:46-48.
26. Goldman RD, Mehrotra S, Pinto TR, et al. Follow-up after a pediatric emergency department visit: telephone versus e-mail? *Pediatrics.* 2004;114:988-991.
27. Horne A, Ros SP. Telephone follow-up of patients discharged from the emergency department: how reliable? *Pediatr Emerg Care.* 1995;11:173-175.
28. Baer D. Patient-physician e-mail communication: the Kaiser Permanente experience. *J Oncol Pract.* 2011;7:230-233.
29. Patel PB, Vinson DR. Team assignment system: expediting emergency department care. *Ann Emerg Med.* 2005;46:499-506.
30. Blumberg SJ, Luke JV. Wireless substitution: early release of estimates from the National Health Interview Survey, July-December 2010. Division of Health Interview Statistics, National Center for Health Statistics, June 2011. Available at: <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201106.htm>. Accessed November 18, 2012.
31. D'Amore J, Murray J, Powers H, et al. Does telephone follow-up predict patient satisfaction and readmission? *Popul Health Manag.* 2011;14:249-255.
32. Houston TK, Sands DZ, Jenckes MVV, et al. Experiences of patients who were early adopters of electronic communication with their physician: satisfaction, benefits, and concerns. *Am J Manag Care.* 2004;10:601-608.
33. Peleg R, Avdalimov A, Freud T. Providing cell phone numbers and email addresses to patients: the physician's perspective. *BMC Res Notes.* 2011;4:76.
34. Isaacman DJ, Khine H, Losek JD. A simple intervention for improving telephone contact of patients discharged from the emergency department. *Pediatr Emerg Care.* 1997;13:256-258.
35. Department of Health and Human Services. Medicare and Medicaid Programs. Electronic health record incentive program—stage 2. *Fed Reg.* 2012;77:13698-13829. Available at: <http://www.gpo.gov/fdsys/pkg/FR-2012-03-07/pdf/2012-4443.pdf>. Accessed November 18, 2012.
36. Wallace P, Barber J, Claton W, et al. Virtual outreach: a randomized controlled trial and economic evaluation of joint teleconferenced medical consultations. *Health Technol Assess.* 2004;8:1-106, iii-iv.
37. Adams SL, Thompson DA. Inability to follow up ED patients by telephone: there must be 50 ways to leave your number. *Acad Emerg Med.* 1996;3:271-273.
38. Thibodeau LG, Chan L, Reilly KM, et al. Improving telephone contact rates of patients discharged from the emergency department. *Ann Emerg Med.* 2000;35:564-567.
39. Boudreaux ED, Clark S, Camargo CA Jr, for the MARC Investigators. Telephone follow-up after the emergency department visit: experience with acute asthma. *Ann Emerg Med.* 2000;35:555-563.
40. Jones J, Clark W, Bradford J, et al. Efficacy of a telephone follow-up system in the emergency department. *J Emerg Med.* 1988;6:249-254.
41. Jones JS, Young MS, LaFleur RA, et al. Effectiveness of an organized follow-up system for elder patients released from the emergency department. *Acad Emerg Med.* 1997;4:1147-1152.
42. Wong RK, Tan JS, Drossman DA. Here's my phone number, don't call me: physician accessibility in the cell phone and e-mail era. *Dig Dis Sci.* 2010;55:662-667.