*International Journal for Quality in Health Care* 2006; **Volume 18, Number 3:** pp. 238–245
Advance Access Publication: 14 March 2006
10.1093/intqhc/mzl002

# A multifaceted intervention improves patient satisfaction and perceptions of emergency department care

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## Abstract

**Objectives.** We aimed to evaluate the effectiveness of a multifaceted intervention, targeting staff–patient communication, in improving emergency department patient satisfaction.

**Methods.** We undertook a pre- and post-intervention study in a university-affiliated emergency department, over a 12-month period. The intervention included communication workshops, a patient education film, and a patient liaison nurse. At the patient level, the patient liaison nurse ensured optimal staff–patient community communication and played a role in staff communication education. The intervention was evaluated using patient surveys (containing general and communication-specific satisfaction items scored out of 100), complaint rates, and patient liaison nurse activity data.

**Results.** A total of 321 and 545 patients returned questionnaires in the pre- and post-intervention periods, respectively. Significant improvements were observed in patients' perceptions of being 'informed about delays' [score difference, 5.3; 95% confidence interval (CI), 0.6–10.0], that 'staff cared about them as a person' (difference, 4.4; 95% CI, 0.7–8.1), the overall emergency department facility assessment (difference, 3.9; 95% CI, 0.4–7.5) and overall emergency department care (difference, 3.8; 95% CI, 0.3–7.3). Non-significant improvements were seen in all other satisfaction items. In the post-intervention period, there was a 22.5% (95% CI, 14.6–32.8) decrease in the number of complaints received and a decrease in the complaint rate of 0.7 (95% CI, –0.3 to 1.6) complaints per 1000 patients. The patient liaison nurse activities included orientation of the patient including (i) explanation of tests, procedures, and delays; (ii) communication with a range of hospital staff; and (iii) general comfort measures including analgesia quality control.

**Conclusion.** Significant improvements in a variety of patient satisfaction measures were achieved with an intervention comprising staff communication workshops, a patient education film, and a patient liaison nurse.

**Keywords:** communication, complaints, emergency department, satisfaction

Patient satisfaction has been shown to correlate with improved medical compliance [1], decreased utilization of medical services [1], less malpractice litigation [1,2], and greater willingness to return to the health care provider [1–3]. These findings indicate that health care providers should endeavour to maximize the satisfaction of the patients they manage. Clearly, patient complaints are related to their satisfaction with the service provided and analyses of the nature of complaints is thought to allow the identification of problems and to assist in their elimination [1,2,4]. Accordingly, many authorities believe that quality assurance measures should include patient satisfaction and complaint analyses [3,5–9].

Patient satisfaction with their emergency department experience has been associated with a number of different predictor variables related to patient demographics and visit characteristics. Trout *et al.* [10] and Boudreaux [11], in separate review articles, concluded that important underlying determinants of emergency department patient satisfaction include information provision, interpersonal interactions, and perceived waiting time. Each of these factors is, in turn, related to staff–patient communication. Indeed, this is supported by numerous reports that have concluded that complaints related to communication comprise considerable proportions of all complaints received in both general hospital [2,4,6,9,12] and emergency department settings [5,8,13,14].

As most complaints appear to be resolvable by way of explanation or apology, it has been suggested that many complaints should be preventable, given improved communication [6,9,15]. Indeed, it has been reported that customer service training [15] and communication skills workshops [16] can both reduce patient complaints and improve levels of satisfaction in the emergency department setting. Furthermore, it has been reported that the provision of information has a significant impact on patients' perception of the quality of care and overall satisfaction [17].

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It appears, therefore, that there is a range of interventions with demonstrated success in significantly improving staff–patient communication and patient satisfaction. This project aimed to develop and implement a multifaceted intervention strategy to improve communication in a large tertiary referral emergency department. It also aimed to evaluate this intervention in terms of its impact upon patient satisfaction and complaint rates. If successful, it is expected that this intervention model could be appropriate for incorporation into other emergency departments endeavouring to improve their service quality and patients' experience.

## Methods

### Study design and setting

The study was a prospective intervention trial that evaluated patient satisfaction before and after introduction of the study intervention. It was undertaken in the emergency department of the Royal Melbourne Hospital, a university-affiliated centre in Victoria, Australia, that treats approximately 47 000 patients per year with relatively little seasonal variation. The intervention was developed in early 2003 and implemented on 17 August 2003. The Royal Melbourne Hospital Human Research and Ethics Committee reviewed the project and, as a quality improvement activity, considered that it was exempt from full ethics committee review.

### Study protocol

Information for development of the intervention was obtained from the Health Services Commissioner complaints data, the Victorian Health Complaints Information Program (HCIP) data, Royal Melbourne Hospital emergency department case-specific complaints data, the medical literature, and multidisciplinary focus groups comprising senior emergency department medical and nursing staff and the Melbourne Health patient advocate. After a thorough review of the existing data and literature available, the participants determined that, for our purposes, no single existing intervention would be suitable. Accordingly, the final intervention model developed comprised three separate components. These were either based on reports of other successful interventions (communication training for all emergency department staff), the utilization of an existing facility (a patient education film), or the development of a completely new initiative (a patient liaison nurse). Details are described in Table 1.

### Measurements

The primary study endpoints were elements of patient satisfaction that related to issues of emergency department care and communication including staff courtesy, information provision, and caring. In our emergency department, patient satisfaction has been evaluated routinely as a quality assurance activity. On a 3-month basis, every week for 6 weeks a random selection of 100 emergency department patients who had been discharged to home within the previous 7 days were mailed a satisfaction questionnaire. This sample comprised approximately 17% of all discharged patients. This questionnaire, developed by the international research company Press Ganey™, has been used widely in medical settings and has been designed to meet high standards of reliability and validity [19]. It comprises a range of statements (items) related to

Table 1 Details of the study intervention components

1. Communication and quality of care in-service workshops.
A professional training and development company was contracted to design and deliver 2-hour workshops tailored for the emergency department environment. All (100%) emergency department staff (medical, nursing, allied health, clerical staff, and assistants) were required to attend a workshop. Each comprised approximately 15 staff and was led by a consultant from the contracted company. A range of issues relating to patient management skills was discussed including patient perceptions and vulnerabilities, interpersonal communication, determinants of patient satisfaction, perceived deficiencies in holistic management, barriers to high-quality care, and problem resolution. The format comprised didactic presentation of relevant material (e.g. the approach to customer satisfaction by other industries), group discussion, problem-solving exercises, and feedback from scenario presentations.

2. 'Welcome to the emergency department' video production.
This comprised a 10-minute DVD presentation that cycled on a dedicated emergency department waiting room television monitor. It was produced by the InformED initiative [18] and described the process of patient triage and other poorly understood or misunderstood emergency department processes. These included the order in which patients are seen, waiting times, departmental registration, and illness evaluation and management issues.

3. Patient liaison nurse
This was a single, supranumary position shared by two senior emergency department nurses at any one time. The patient liaison nurse worked approximately five, 8-hour shifts per week. The role entailed quality control of all aspects of communication and care of patients and their families in the emergency department. Special attention was paid to patient/family understanding of emergency department processes, management and discharge plans, reasons for delays, explanations of investigations, and communication with general practitioners and community support services. In addition to direct patient intervention, the patient liaison nurse acted as role model and mentor to other emergency department staff.

patient management, for example 'nurses' concern to keep you informed about your treatment. For each item, patients are asked to provide a response on a 5-point Likert scale. A response of 'very poor' attracted a score of 0 points, 'poor' 25, 'fair' 50, 'good' 75, and 'very good' 100. Mean scores for each item are calculated for the complete respondent group. Before the study, 14 general and communication-related satisfaction items were selected as suitable endpoints.

Two pre-intervention and three post-intervention surveys were undertaken between January–June 2003 and August 2003–April 2004, respectively. For each survey, sufficient patients were surveyed until at least 145 completed questionnaires were returned. This sample size was determined after examination of historical emergency department survey data and ensures a 95% confidence interval (CI) of ±2 points around the mean value of item responses. Press Ganey™ received all completed questionnaires directly from the patients, collated all data, and provided a detailed report to the emergency department. Data from each period (before and after intervention) were then pooled before final analysis.

Secondary study endpoints included the number and nature of patient complaints received by the emergency department. Complaint data from all hospital departments is routinely collected for HCIP of the Victorian Health Services Commissioner. Complaints are separated into categories of communication, access, treatment, rights, administration, environment and cost, and departmental complaint rates can be generated [9]. Complaint data were compiled for the pre- and post-intervention periods of 1 January to 17 August 2003 (229 days) and 18 August 2003 to 31 March 2004 (227 days), respectively. Complaint rates, defined as number of complaints per 1000 emergency department presentations, are reported.

Additional secondary endpoints were the number and nature of specific interventions that the patient liaison nurse made in the emergency department management of individual patients. Data for the first 1000 patients seen by the patient liaison nurse were entered prospectively onto a specifically designed data collection form. The data collected related to communication with both patients and/or relatives regarding emergency department processes, investigations, and discharge, and with a range of emergency department, allied health, and in-patient staff.

### Data analysis

With 300 patients surveyed, both before and after intervention, the study had a power of 0.86 to show a change of 5 points (e.g. 77–82, standard deviation, 20) in a survey item (two-sided, level of significance, 0.05). A change of 5 points was considered clinically significant. As mean pre-intervention item scores were reasonably high (all but one >75), the scope for improvement in scores was less than if the baseline scores were low. Furthermore, item scores tend to be reasonably stable. A review of item score changes at the first and second pre-intervention surveys revealed mean absolute changes for our 14 items of interest of only 1.1 and 1.4, respectively. Furthermore, the maximum absolute changes for any single item were 2.4 and 3.3, respectively. Hence, our choice of 5 was in excess of these historical fluctuations.

Pre- and post-intervention data were compared using the chi-squared test and Fisher's exact tests (categorical data), the independent sample 2-tailed *t*-test (normal, continuous data), the Mann–Whitney *U* test (ordinal data) and the Normal (Z) test (comparison of rates). The interventions of the patient liaison nurse are reported descriptively. SPSS for Windows software (version 12.0.1, SPSS, Chicago, IL, USA) was used for all data analysis. The level of significance was 0.05.

## Results

Satisfaction questionnaires were returned by 321 and 545 patients in the pre- and post-intervention periods, respectively. These respondents represented 2.3% of the 37 080 patients who were discharged home during the entire study period (January 2003–April 2004, inclusive). Compared with all patients who were discharged home, respondents were more likely to be female (53.3% versus 45.5%, $P < 0.01$) and aged 50 years or more (51.5% versus 32.7%, $P < 0.01$). However, there were no significant differences between the pre- and post-intervention groups in gender ($P = 0.72$) and age ($P = 0.19$) distributions (Table 2). Almost all questionnaires were complete, although occasional data values were missing. In some cases, items were not completed, as they were not applicable, for example 'courtesy to family/friends' is not applicable to patients who attended the emergency department alone.

Table 3 describes the responses to the pre- and post-intervention satisfaction items.

Compared with the pre-intervention period, significant improvements ($P < 0.05$) were seen in the 'being informed about delay', 'staff cared about you as a person', 'overall

**Table 2** Demographics of respondents in the pre- and post-intervention periods

| | Pre-intervention ($n = 321$) [$n$ (%)] | Post-intervention ($n = 545$) [$n$ (%)] |
|---|---|---|
| Gender | | |
| Male | 138 (45.7) | 250 (47.3) |
| Female | 164 (54.3) | 279 (52.7) |
| Totals | 302[1] (100) | 529[1] (100) |
| Age group (years) | | |
| 0–17 | 8 (2.6) | 3 (0.6) |
| 18–34 | 102 (32.7) | 135 (27.0) |
| 35–49 | 47 (15.1) | 99 (19.8) |
| 50–64 | 63 (20.2) | 123 (24.6) |
| 65–79 | 74 (23.7) | 104 (20.8) |
| 80 or more | 18 (5.8) | 37 (7.4) |
| Total | 312[1] (100) | 501[1] (100) |

[1]Some data missing due to incomplete responses from respondents.

**Table 3** Patient satisfaction responses during the pre- and post-intervention periods

| Satisfaction item | Pre-intervention | | Post-intervention | | Change | *P*-value |
|---|---|---|---|---|---|---|
| | *n* | Mean (SD) | *n* | Mean (SD) | Difference (95% CI) | |
| Informed about delays | 274 | 61.8 (32.5) | 475 | 67.1 (31.2) | 5.3 (0.6, 10.0) | 0.03 |
| Staff cared about you as person | 288 | 75.4 (26.3) | 514 | 79.8 (25.6) | 4.4 (0.7, 8.1) | 0.02 |
| Standard of overall facility assessment | 307 | 77.8 (25.9) | 539 | 81.7 (24.9) | 3.9 (0.4, 7.5) | 0.03 |
| Overall rating emergency department care | 301 | 78.7 (25.2) | 537 | 82.5 (24.4) | 3.8 (0.3, 7.3) | 0.03 |
| Adequacy of information to family/friends | 185 | 76.2 (27.0) | 347 | 80.0 (25.6) | 3.8 (–0.9, 8.5) | 0.11 |
| Likelihood of recommending | 297 | 77.3 (28.9) | 527 | 80.8 (27.2) | 3.5 (–0.5, 7.5) | 0.08 |
| Overall assessment | 307 | 77.8 (25.9) | 539 | 81.0 (25.3) | 3.2 (–0.4, 6.8) | 0.08 |
| Courtesy shown to family/friends | 190 | 80.0 (22.6) | 356 | 82.2 (23.3) | 2.2 (–1.8, 6.3) | 0.29 |
| Doctors | | | | | | |
| Informative regarding treatment | 305 | 81.9 (23.0) | 523 | 84.2 (22.9) | 2.3 (–0.9, 5.5) | 0.16 |
| Courtesy | 301 | 85.7 (20.5) | 532 | 87.5 (19.5) | 1.8 (–1.0, 4.6) | 0.21 |
| Took time to listen | 302 | 84.1 (21.4) | 529 | 85.6 (21.2) | 1.5 (–1.5, 4.5) | 0.33 |
| Nurses | | | | | | |
| Informative regarding treatment | 291 | 76.6 (26.9) | 498 | 78.4 (26.0) | 1.8 (–2.0, 5.6) | 0.35 |
| Courtesy | 299 | 84.2 (20.8) | 514 | 85.9 (20.7) | 1.7 (–1.3, 4.7) | 0.26 |
| Took time to listen | 302 | 82.0 (22.5) | 502 | 83.8 (21.2) | 1.8 (–1.3, 4.9) | 0.25 |

CI, confidence interval.

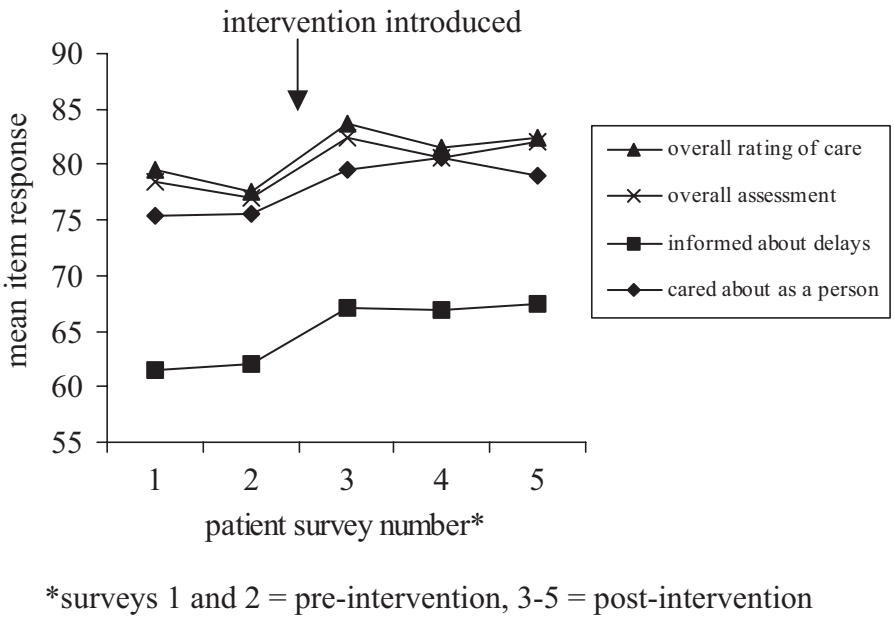


**Figure 1** Trend of important variables over the pre- and post-intervention periods.

assessment of the facility', and 'overall rating of emergency department care' items. Absolute scores for all other items improved during the post-intervention period, although none improved significantly ($P > 0.05$).

Figure 1 displays the trends in mean scores of the four satisfaction items that improved significantly in the post-intervention period. Pre-intervention scores (surveys 1 and 2) tended to be stable without an apparent upward trend over time. Each of the scores rose immediately after the introduction of the intervention (survey 3) and remained stable over the remainder of the post-intervention period (surveys 4 and 5).

Table 4 describes the number and nature of complaints that were lodged by emergency department patients during the pre- and post-intervention periods. Twenty fewer complaints were received in the post-intervention period, a decrease of 22.5% (95% CI, 14.6–32.8). This represented a decrease in complaint rates from 3.2 (95% CI, 2.6–3.9) to 2.6 (95% CI, 2.0–3.2) complaints per 1000 patients and a rate difference of

**Table 4** Number and nature of complaints lodged, pre- and post-intervention

| Nature of complaint | Pre-intervention[1] [*n* (%)] | Post-intervention[2] [*n* (%)] |
|---|---|---|
| Treatment | 43 (48.3) | 37 (53.6) |
| Communication | 18 (20.2) | 14 (20.3) |
| Rights | 10 (11.2) | 9 (13.0) |
| Access to health care | 14 (15.7) | 6 (8.7) |
| Cost | 1 (1.1) | 3 (4.4) |
| Atmosphere/ environment | 2 (2.3) | 0 (0.0) |
| Administration | 1 (1.1) | 0 (0.0) |
| Total | 89 (100) | 69 (100) |

[1]Pre-intervention complaints data collected between 1 January and 17 August 2003 (229 days).
[2]Post-intervention complaints data collected between 18 August 2003 and 31 March 2004 (227 days).

0.7 (95% CI, –0.3 to 1.6) complaints per 1000 patients ($P$ = 0.09). Overall, the proportions of complaints within each complaint category did not differ between the periods ($P$ = 0.52). Complaints relating to communication remained the second largest category of complaint and the proportions of complaints in this category remained almost identical despite the intervention.

Table 5 describes the number and nature of the specific interventions made by the patient liaison nurse in the emergency department management of the first 1000 patients seen. The most frequently undertaken task was orientation of the patient to the emergency department, especially with an explanation of tests, procedures, and delays. For more than one-half of patients, family members were contacted and updated. Communication with a range of hospital staff, especially the emergency department staff, was also undertaken frequently. General comfort measures for the patient was also an important task and included interventions to ensure that analgesia was adequate.

## Discussion

The results demonstrate that the multifaceted intervention implemented in this study resulted in important improvements in measures of patient satisfaction. These findings support those of others who have suggested that communication and education are among the most important issues impacting on patient satisfaction [1,17,20,21] and that communication

**Table 5** Interventions made by the patient liaison nurse for the first 1000 patients

| Interventions made | *n* (%) | 95% confidence interval |
|---|---|---|
| Patient introduction to the emergency department | | |
| Emergency department brochure provided | 555 (55.5) | 52.4, 58.6 |
| Reason for emergency department presentation explained | 661 (66.1) | 63.1, 69.0 |
| Tests, procedures, and delays explained | 732 (73.2) | 70.3, 75.9 |
| Communication with patients' families | | |
| Family present in the emergency department | 435 (43.5) | 40.4, 46.6 |
| Family not present in the emergency department but contacted | 140 (14.0) | 11.9, 16.3 |
| Communication with hospital staff | | |
| Emergency department medical and/or nursing staff | 703 (70.3) | 67.3, 73.1 |
| Radiology | 75 (7.5) | 6.0, 9.4 |
| Pathology | 66 (6.6) | 5.2, 8.4 |
| Care coordination team | 133 (13.3) | 11.3, 15.6 |
| Allied health | 104 (10.4) | 8.6, 12.5 |
| In-patient admitting unit | 132 (13.2) | 11.2, 15.5 |
| Patient comfort | | |
| General measures—such as pillows, drinks | 601 (60.1) | 57.0, 63.1 |
| Interventions when analgesia inadequate | 76 (7.6) | 6.1, 9.5 |
| Emergency department management and discharge | | |
| Update of emergency department processes | 295 (29.5) | 26.7, 32.5 |
| Discharge procedures explained | 154 (15.4) | 13.3, 17.8 |
| Provision of discharge information | 95 (9.5) | 7.8, 11.5 |
| Discharge appointments explained | 43 (4.3) | 3.2, 5.8 |
| Discharge medication explained | 39 (3.9) | 2.8, 5.3 |
| Transport organized | 48 (4.8) | 3.6, 6.4 |

training can directly improve patient satisfaction levels [15,16]. There are reports of communication interventions, however, that are not consistent with our findings. Sun *et al.* [22] distributed a one-page patient education form to patients upon arrival, and Mowen *et al.* [23] provided information on estimated waiting time. Neither study resulted in significant improvements in measures of patient satisfaction. Although these studies employed single rather than multifaceted interventions, their failure to improve patient satisfaction hints that communication interventions may be more effective if they incorporate substantial person-to-person contact.

All satisfaction items examined showed improvements after intervention. However, the trends over time of the four satisfaction items that improved significantly are important. They reveal reasonably stable scores before intervention, followed by sustained increases immediately after the introduction of the study intervention. The stability of the pre- and post-intervention periods supports the internal validity of the pre–post study methodology.

It is noteworthy that three of the four items that improved significantly (patient cared for as a person, overall facility, and care assessments) were general satisfaction items. Only one item (informed about delays) related directly to communication. Although it was expected that more communication-specific items would have improved significantly, we contend that significant improvements in general items may be more important overall. Indeed, there may be little ultimate benefit if communication is perceived to be excellent whereas overall perceptions of the facility and patient care are not. This contention is consistent with the conclusion of Boudreaux *et al.* [24] that perception of care was the best predictor of overall satisfaction.

It is difficult to explain why more general, rather than communication-specific satisfaction items improved significantly. One possibility is that improvement in communication after the intervention impacted directly upon patients' perceptions of the facility and care in general. A second possibility is that the intervention impacted not only on communication but on a range of other areas of emergency department care. Evidence for this lies in the multifaceted nature of the intervention. In particular, it is clear that not all patient liaison nurse activities related to communication issues. Indeed, many interventions involved patient comfort which itself is likely to be an important factor influencing patient satisfaction, generally. Furthermore, the staff in-service training sessions included broad issues of service provision as well as communication issues, specifically. A third possibility is that, as the magnitude of the changes seen in the items examined were small, interpretations of these findings are difficult.

The considerable decrease (22.5%) in the number of complaints lodged in the post-intervention period was encouraging. This decrease is consistent with the improvements in the satisfaction items examined and the findings of other studies involving communication interventions [15,16]. We believe this decrease to be clinically significant. However, the small absolute number of complaints is likely to explain the non-statistically significant decrease in complaint rates. Importantly, the post-intervention complaint rate of 2.6 complaints per 1000 patients almost equated the rate of 2.7 complaints per 1000 patients that has been reported for all Victorian emergency departments combined [8]

Interestingly, the proportion of communication-related complaints (approximately 20%) remained stable despite the intervention. However, this proportion is considerably lower than those reported in other studies. Anderson *et al.* [6] reported a proportion of 45% in one south Australian hospital and Ooi *et al.* [25] reported a proportion of 36.7% in a Hong Kong study. As these studies examined differing patient groups and used different methodologies, direct comparison of proportions is difficult. Taylor *et al.* [8], using the same methodology as our study, reported a proportion of 31.6% from patients in Victorian emergency departments. This study does provide a useful comparison and indicates that the proportion of communication-related complaints in our study was relatively low. This may partially explain the lack of effect that the study intervention had on the proportion of communication-related complaints. Relatively small intervention effects would be expected, if the baseline proportion and absolute numbers of communication-related complaints were small. Accordingly, few conclusions can be drawn from these proportion data.

It is clear that the patient liaison nurse had a wide range of activities. Ideally, there would be no role for the patient liaison nurse if patient care were perfect. Despite the best intentions and hard work of health care workers, the hectic and stressful emergency department environment is likely to impact adversely upon quality of care to some degree. Although it appears that the patient liaison nurse activities were required because of deficiencies in usual patient care, this may not always have been the case. Indeed, it is likely that patient liaison nurse activities often complemented those of the usual carers. Information provided repeatedly, by more than one person and in different ways, is likely to be better retained and may improve the patients' perception of staff care. Although we chose to employ a nurse to fill the Patient Liaison role, it is likely that other emergency department personnel could be equally effective in this role. Indeed, Tran *et al.* [21] have reported that the repeated provision of clinically based information by a medical student improved significantly a range of satisfaction measures.

Care was required to ensure that the patient liaison nurse was not directed to general patient care, especially during times of staff shortage and heavy patient load. The position was dedicated to the project and was supranumary at all times. Resources restricted the position to only several shifts per week. However, as well as direct patient involvement, the patient liaison nurse had an important role in education of other staff members. As well as acting as a role model endeavouring to maximize the quality of patient care, deficiencies in patient care that were identified and managed by the patient liaison nurse afforded instruction to other staff members. Finally, the nature of the patient liaison nurse activities has provided some insight into areas at 'high risk' of deficiency, especially in relation to staff–patient communication. Although the

study was not specifically designed to determine 'high risk' areas, the findings will be of use to direct refinement of the intervention model.

This study has important limitations. As it was undertaken in a single emergency department, its external validity may be limited. Furthermore, the exclusion of patients who were admitted to the hospital may have introduced selection bias. However, this exclusion was deliberate as it retained the department's ongoing quality control methodology and avoided measurement bias through contamination of patient responses by their in-patient experience. Whereas the survey methodology has been designed by Press Ganey™ to maximize the validity of the data, all mail surveys are susceptible to selection and recall bias. Indeed, the finding that the respondents were older and more likely to be female indicates that there was an element of selection bias. Although the direction and extent of this bias cannot be determined, it may have impacted upon the study's internal validity. Furthermore, although the Press Ganey™ instrument is reliable and valid, its items were not designed specifically for our purposes. Accordingly, they may not have been sensitive to the changes implemented.

We have attributed the improvements in the study outcomes to the study intervention. However, it is possible that other factors could have confounded the results. These factors may have included differences in staffing profile, departmental activity, access block, and seasonal effects between the pre- and post-intervention periods. Although these factors are all likely to affect patient satisfaction, it is noteworthy that the first months of the post-intervention period included the busy winter period when, historically, the department is under most pressure and most susceptible to access block. Finally, as a multifaceted intervention, it was not possible to determine the magnitude of effect of any one of its components. Although unlikely, it is possible that one or more component had little effect on the study endpoints and comment can be made only on the worth of the intervention as a whole.

Despite these limitations, the findings of this study indicate that this multifaceted intervention model can result in clinically and statistically significant improvements in a range of measures of patient satisfaction. We recommend that other emergency departments consider interventions aimed at improving their quality of care. We also recommend that further research be undertaken in order to refine this or similar models. Evaluation of the effects of the intervention's components is indicated. Furthermore, the study should be replicated in a multicentre setting with more comprehensive data collection and analysis. For example, it would be useful to examine patients with known exposure to the various intervention components and to receive patient feedback regarding the perceived usefulness of each component. Also, additional interventions thought to improve patient satisfaction should be examined, as well as multifaceted combinations. Finally, the interaction between improved patient satisfaction and emergency department staff job satisfaction could be explored. Intuitively, satisfaction within one or both groups is likely to engender and reinforce satisfaction in the other.

## Acknowledgements

This project was supported by a grant from the Australian Council for Safety and Quality in Health Care. The authors thank patient liaison nurses, Ms Stacey Casley, Mrs Jenny Rawet, Mr Geoffrey Devine, Ms Shannon Nel, and Ms Ainsley Smallwood for assistance in data collection. We also thank Ms Catherine Macbean for assistance in manuscript preparation.

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**Accepted for publication 15 February 2006**