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► **To cite this version:**

Ajit Sarvadikar, Gordon Prescott, David Williams. Attitudes to reporting medication error among differing healthcare professionals. *European Journal of Clinical Pharmacology*, 2010, 66 (8), pp.843-853. 10.1007/s00228-010-0838-x . hal-00598969

**HAL Id: hal-00598969**

**<https://hal.science/hal-00598969>**

Submitted on 8 Jun 2011

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# Attitudes to reporting medication error among differing healthcare professionals

Ajit Sarvadikar · Gordon Prescott · David Williams

Received: 3 January 2010 / Accepted: 11 May 2010 / Published online: 8 June 2010  
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## Abstract

**Aims** Medication error reporting is an important measure to prevent medication error incidents in a healthcare system and can serve as an important tool for improving patient safety. This study aimed to investigate attitudes of healthcare professionals (doctors, nurses, and pharmacists) in reporting medication errors.

**Methods** Fifty-six healthcare professionals working at a 900-bed tertiary referral hospital were surveyed. A questionnaire using two different clinical scenarios (involving oral and intravenous administration of a drug) and four questions with an ascending order of worsening patient outcome was used. A Likert scale ranging from 1 (unlikely) to 5 (likely) was used to describe the likelihood of reporting a medication error.

**Results** The overall response rate was 57% (43% for doctors, 68% for nurses, and 64% for pharmacists). Results showed that doctors were unlikely to report less-serious medication errors (median value of 2 on the Likert scale). Nurses and pharmacists (median value of 5) were likely to

report less-serious as well as serious medication errors despite their fears of receiving disciplinary action. All healthcare professionals were more likely to report an error as the clinical scenarios had a progressively worsening outcome for the patient.

**Conclusions** These results suggest that among healthcare professionals, there are differing attitudes to reporting medication errors. Differing approaches are therefore required to encourage medication error reporting among different healthcare professionals. Future study is required to further investigate these findings and improve reporting rates.

**Keywords** Medication error · Attitudes to reporting

## Introduction

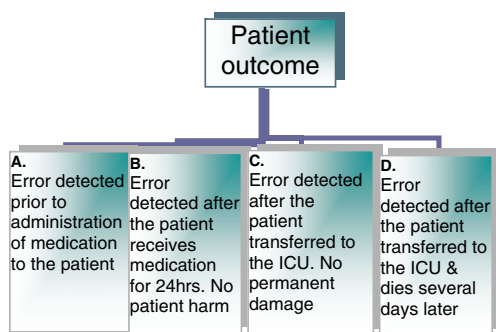
Adverse events (AEs) have been shown to cause harm in between 3% and 17% of hospital inpatients [1–3]. A significant number of these AEs are the result of medication errors that lead to injury in 2–15% of hospital admissions in UK and are the single most preventable cause of patient harm [1, 4]. Medication-error reporting is an important measure to prevent future medication incidents in the healthcare system. Such reporting provides important feedback to reporters and identifies systematic failures in the medication cycle. Prescribing errors are common among junior doctors, in part as a result of inadequate training at undergraduate level [5]. In 1995, the majority of hospitals in England and Wales established an error-reporting system in compliance with the development of national risk management standards [6]. In particular, this system aims to help identify trends and patterns relating to medication safety, thereby allow-

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**Fig. 1** Four stages A, B, C & D showing ascending order of worsening stages of patient outcome in both scenarios

ing identification of contributory factors, their preventability and the impact on patient outcome. One difficulty with medication errors is that they are often underreported [7]. Indeed, routine incident-reporting systems may report as little as 5% of AEs detected by case note review [8]. Barriers to reporting medication errors include feeling of shame [9], fear of punishment [10], complicated reporting systems [7], fear of litigation [6] and an unsupportive culture towards medical errors within the organisation [7]. These barriers are associated either with self-made errors or are a reflection of the administrative difficulty in reporting error.

Among different healthcare professionals, it has been suggested that nurses feel more guilty, worried, embarrassed, and afraid of disciplinary action than doctors and pharmacists as a result of a greater feeling of responsibility for an error, fear of the consequences for the patient and fear of further punishment from senior staff [11]. As little information is available on the differing attitudes of healthcare professionals to reporting error, we conducted a study to determine the attitudes of differing healthcare professionals to reporting medication error and to determine how differing levels of patient outcome influence medication-error reporting.

## Methods

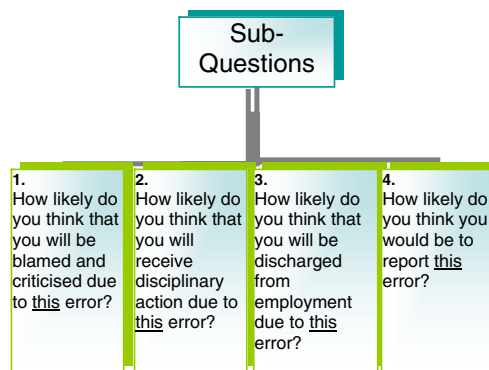
The study was performed at Aberdeen Royal Infirmary (ARI), a 900-bed tertiary referral hospital serving a population of 500,000 in the northeast of Scotland. Permission to perform the study was obtained from the medication safety group who also approved the format of the questionnaire, which was piloted in a previous study performed by the Psychology Department at the University of Aberdeen. Healthcare professionals consisting of doctors, nurses and pharmacists were surveyed using a set of questionnaires specific to each profession (condensed

versions of the questionnaires are in Appendices I, II and III). A month after the first questionnaires had been sent, a reminder questionnaire and a further covering letter were sent to the same staff. Due to measures to protect anonymity, those who responded to the first request could not be identified. The questionnaire had two different scenarios, each of which had four different patient outcomes of worsening degree. In the first scenario (SC1), the respondents were asked to imagine that they had made a prescription error while dealing with a 50-year-old man admitted with acute congestive heart failure. The prescription error led to administration of Inderal (propranolol) 10 mg t.i.d. instead of Isordil (isosorbide mononitrate) 10 mg t.i.d. In the second scenario (SC2), respondents were asked to imagine they had made an incorrect infusion-rate error. The consequences of these errors were presented in four imaginary scenarios that had progressively worsening outcomes for the patient (Fig. 1)

Within each of these patient outcomes, respondents were then asked four further subquestions relating to their likelihood of being blamed, disciplined, discharged from employment and reporting the medication error (Fig. 2). The likelihood of a particular response was measured using a 5-point Likert scale. Subquestion 1 in patient outcome A of SC1 is referred to as SC1A1. Similar terminology was used to refer to other subquestions/patient outcomes/scenarios.

## Statistical analysis

Results were analysed using SPSS software (Statistical Package for the Social Sciences version: 14.0.2). The distributions of responses in the three groups were compared using Kruskal–Wallis tests. Probability values ( $p$  values)  $<0.05$  were considered as statistically significant.



**Fig. 2** Subquestions asked in stages A, B, C and D of scenarios 1 & 2. Answers to these questions were analysed on a Likert scale ranging from 1 (unlikely) to 5 (likely)

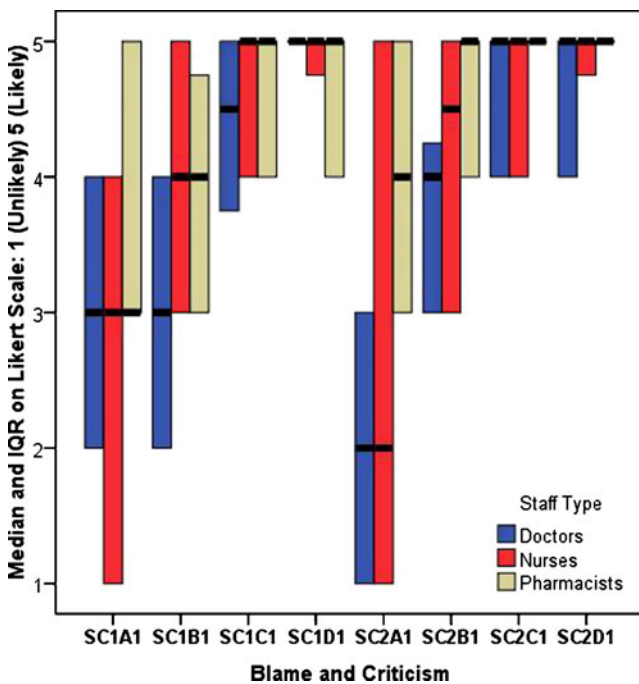
**Results**

From a total of 98 questionnaires sent to healthcare professionals, there were 56 (57%) responses. The response rates after the first questionnaire and a reminder had been sent were 43% for doctors (18/42), 68% for nurses (22/32), and 64% for pharmacists (16/25). The 18 doctors consisted of five Foundation Year 1 (FY1), one FY2, three senior house officers (SHO), two registrars and seven consultants. The 22 nurses consisted of two ward sisters and 20 staff nurses. These professionals had varying years of experience, with doctors having between 1–33 years, nurses less than 1–40 years and pharmacists 4–25 years.

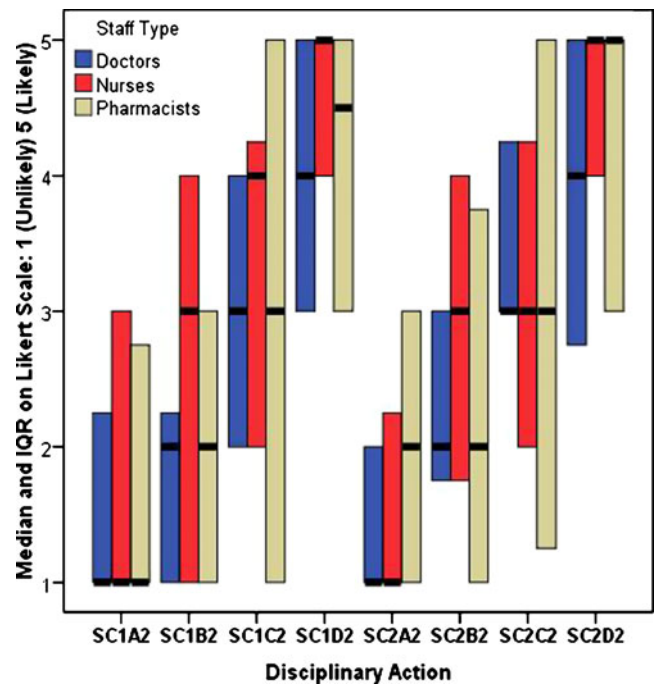
**Blame and criticism scenario**

The responses to the question “How likely do you think it is that you will be blamed and criticised due to this error?” are shown in Fig. 3.

Similar responses on the likelihood of criticism and blame were found in the three professions for many scenarios. However, nurses and pharmacists were more likely to think that they would be blamed and criticised than did doctors in SC1B1 and SC2B1 ( $p < 0.05$ ) (Fig. 3). As patient outcome worsened, most participants from all three professions felt they were likely to be blamed for a medication error.



**Fig. 3** Median values of participants’ concept of likelihood of blame and criticism on a Likert scale for scenarios SC1A1 to SC2D1. SC1A1 Scenario 1 question A1, Likert Scale: 1=unlikely, 5=likely); SC1B1 ( $P = .024$ ) and SC2B1 ( $p = .030$ ) yielded significant  $p$  values



**Fig. 4** Median values of participants’ concept of likelihood of disciplinary action on a Likert scale for each scenario

**Disciplinary action scenario**

Responses to the question: “How likely do you think it is that you will receive disciplinary action due to this error?” are shown in Fig. 4.

All healthcare professionals expressed increased expectation of disciplinary action being taken as the severity of patient outcome increased. Nurses showed a greater expectation of disciplinary action than the other professions (Fig. 4).

**Discharge from employment scenario**

Responses to the question: “How likely do you think it is that you will be discharged from employment due to this error?” are shown in Fig. 5.

Few healthcare professionals thought it likely that they would be discharged from employment as an outcome of a medication error. However, nurses expressed a significantly higher expectation of being dismissed for an error that resulted in severe patient harm in comparison with doctors or pharmacists ( $p = .029$  for SC1D3) (Fig. 5).

**Likelihood to report medication error scenario**

The responses to the question: “How likely do you think it is you would report this error?” are shown in Fig. 6.

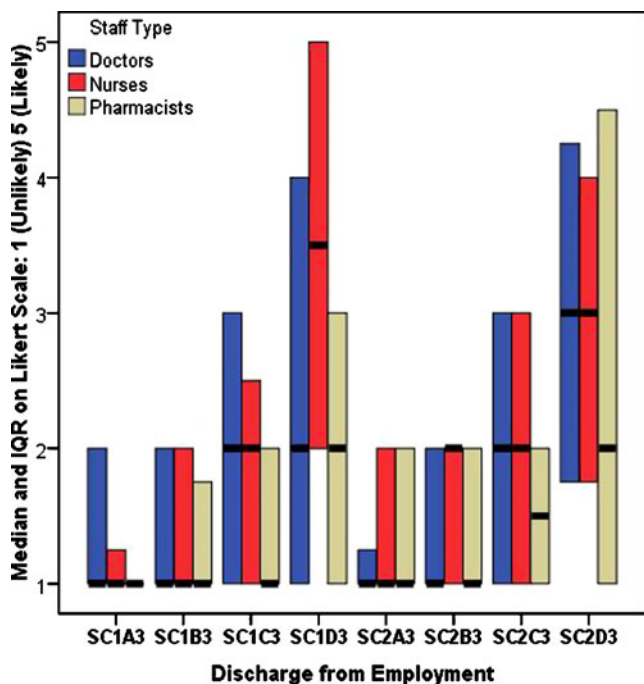


Fig. 5 Median values of participants’ concept of likelihood of discharge from employment on a Likert scale for each scenario. Scenario 1 question D3 (SC1D3) yielded a significant *p* value of .025

Responses of most nurses and pharmacists indicated that they were likely to report all types of errors irrespective of the patient outcome, whereas the likelihood of doctors reporting medication errors increased with worsening patient outcomes (Fig. 6).

**Discussion**

Our results suggest that the type and severity of medication error influence healthcare professionals differently. Whereas nurses and pharmacists were likely to report all medication errors, doctors were only likely to report an error that resulted in an adverse outcome. Other studies have also reported that nurses are more likely to report medication errors than are doctors [10], whereas all healthcare professionals are more likely to report errors that are serious and cause actual harm to patients [11], suggesting that it is the severity of outcome that influences medication error reporting among doctors.

**Blame and criticism**

This study demonstrated that nurses and pharmacists have a higher expectation of being blamed and criticised than do doctors. As the patient outcome in scenarios became worse in SC1C1, SC1D1, SC2C1 and SC2D1, all participants

equally believed they were likely to be blamed. However, nursing and pharmacy staff were more likely to report an error than were doctors, suggesting that though the fear of blame is high in nurses and pharmacists, this is not as strong a barrier to reporting an error as it may be among doctors.

**Disciplinary action and discharge from employment**

All healthcare professionals expressed an increased fear of disciplinary action with an increase in severity of patient outcome. Nurses were most concerned about disciplinary action in most scenarios, in keeping with a previous study that suggested that nurses have greater fear of disciplinary action because of a greater feeling of responsibility for an error, fear about the consequences for the patient and attitudes of senior staff to errors [12]. Doctors were least likely to expect disciplinary action as an outcome of a medication error, whereas pharmacists showed a similar expectation to that doctors towards disciplinary action when patient outcome was less severe. However, responses became more similar as patient outcome worsened. Despite nurses and pharmacists being more likely to think they would receive disciplinary action than were doctors, they were still more likely to say they would report an error. Whereas most healthcare professionals thought being dis-

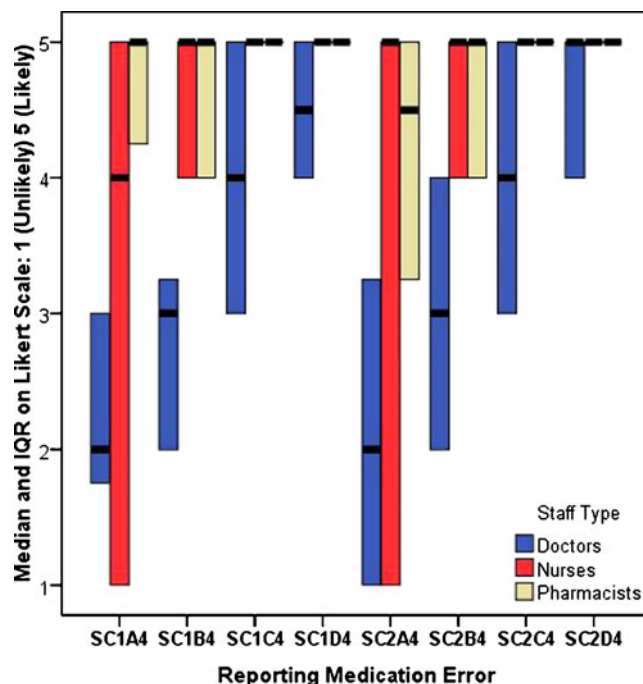


Fig. 6 Median values of participants’ attitudes to reporting medication error showing likelihood on a Likert scale for each scenario. (All *p* values were significant)

charged from employment was an unlikely outcome of a medication error, nurses expressed a greater expectation of being discharged for a medication error that resulted in severe patient harm (SC1D3). This may suggest a perception of an unsupportive working culture for reporting medication errors among nursing staff [12].

#### Likelihood of reporting medication errors

Doctors were more likely to report errors that had a more severe outcome (Fig. 6), whereas nurses and pharmacists were more likely to report all types of errors irrespective of the patient outcome. These findings were in accordance with another study demonstrating that doctors were less likely to report near misses or less-serious patient outcomes in comparison with nurses, who were more likely to report all types of errors [10, 12, 13]. This may be due to a lack of knowledge among doctors of the need to report less-serious errors or a perception of being too busy to have time to report such errors [10]. A previous study has suggested that pharmacists would take patient outcome into account when reporting errors [6]. However, our study suggested that pharmacists would report all types of errors irrespective of patient outcome.

#### Effect of severity of scenario on the responses

Changes in responses with increasing severity (Fig. 6) were in line with a previous study that demonstrated that all healthcare professionals are more likely to report errors that are serious and cause actual harm to patients [11].

#### Limitations of the study

A weakness was that formal calculations to determine the appropriate sample size, including inflation to take account of estimated response rates, were not undertaken during the study design stage. To preserve anonymity, very few details of personal characteristics were requested, in particular, age and sex data were not collected, which made it impossible

to compare participants and nonparticipants to assess generalisability. The study was performed in a single centre on a relatively small sample size of 56 healthcare professionals consisting of 18 doctors, 22 nurses and 16 pharmacists. Therefore, it may be difficult to generalise these results further. However, the findings are broadly consistent with earlier work on single and multiple professional groups and provide an important insight into the attitudes of differing healthcare professionals to reporting almost identical medication errors. Whereas the majority of physicians did not respond to the questionnaire, we feel that the information provided, albeit limited, does provide an important insight into physician attitudes to reporting medication error.

#### Conclusions

This study demonstrated that nursing and pharmacy staff members are likely to believe they will be blamed and criticised for an error, although they are still more likely to report an error than are doctors. Nurses expressed a much higher expectation of disciplinary action for all types of medication errors, whereas doctors and pharmacists believed they would receive disciplinary action only for serious errors. Accurate reporting of individual medication errors is essential for identifying system faults that can contribute to the likelihood of future errors [14]. Therefore, error reporting helps improve medication safety by addressing systems failures and helps to prevent future errors by allowing appropriate staff training [11]. Our results suggest that hospitals should review their policies on error reporting to ensure they actively encourage staff of all healthcare professions to report medication errors and to support a blame-free culture in the organisation.

**Acknowledgement** We thank the medical, nursing and pharmacy staff of Aberdeen Royal Infirmary who participated in this study. We thank Mr. Tim Delaney for use of the questionnaire used in this study.

**Appendix I—Medical Staff Questionnaire****MEDICAL STAFF QUESTIONNAIRE REGARDING ERROR REPORTING**Scenario #1

You are clerking in a 50 year old man who has been admitted with congestive heart failure. In transcribing from his list of drugs on admission you prescribe Inderal(Propranolol) 10mg TID (Three Times a Day) instead of Isordil(Isosorbide dinitrate) 10mg TID.

Please indicate your opinion by circling a number 1 to 5 for each of the following questions.

- A. The nurse administering the drug detects the error prior to the patient receiving the wrong medication.**

Sub questions SC1A1-SC1A4 as listed in figure2.

- B. The error is detected by your registrar after the patient receives the wrong medication for 24 hours. The patient suffers no adverse outcome resulting from this error.**

Sub questions SC1B1-SC1B4 as listed in figure2.

- C. The error is detected after the patient becomes haemodynamically unstable and is transferred to the ICU (Intensive Care Unit). The patient suffers no permanent adverse outcome resulting from this error.**

Sub questions SC1C1-SC1C4 as listed in figure2.

- D. The error is detected after the patient becomes haemodynamically unstable and is transferred to the ICU. The patient dies several days later resulting from this error.**

Sub questions SC1D1-SC1D4 as listed in figure2.

Scenario #2

You mis-prescribe the rate for administering heparin. The incorrect rate is 10 times greater than the correct dose.

- A. The error is detected by you prior to the patient receiving the wrong infusion.**

Sub questions SC2A1-SC2A4 as listed in figure2.

- B. Same scenario, but the error is detected by a fellow staff member after the patient receives the wrong dose for 24 hours. The patient suffers no adverse outcome resulting from this error.**

Sub questions SC2B1-SC2B4 as listed in figure2.

- C. The error is detected when the patient experiences a large gastrointestinal haemorrhage and increased APTT (Activated Partial Thromboplastin Time) ratio. The patient is being transferred to the ICU. The patient suffers no permanent damage resulting from this error.**

Sub questions SC2C1-SC2C4 as listed in figure2.

- D. The error is detected due to the patient having a gastrointestinal haemorrhage and increased APTT ratio. The patient is transferred to the ICU. The patient dies several days later resulting from this error.**

Sub questions SC2D1-SC2D4 as listed in figure2.

**Please briefly explain below why, in your opinion, medication errors are gathered and investigated.**

Will you be “praised” by your peers for reporting errors?

Yes

No

Will you be “praised” by your hospital administration for reporting errors?

Yes

No

How long have you been employed as a doctor?

\_\_\_\_\_ (in years)

How long have you been employed as a doctor in our organisation?

\_\_\_\_\_ (in years)

Are you employed as:

\_\_\_\_\_ a FY1/2

\_\_\_\_\_ a S.H.O.

\_\_\_\_\_ a Registrar

\_\_\_\_\_ a Consultant

Do you work in:

\_\_\_\_\_ Adult services?

\_\_\_\_\_ Paediatric services?

Have you ever reported a medication error?

\_\_\_\_\_ Yes

\_\_\_\_\_ No

If yes, please comment on any action taken regarding the error.



## Appendix II—Nursing Staff Questionnaire

### Scenario #1

You misread a doctor's prescription, written for a 50 year old man who has been admitted with congestive heart failure. You mistakenly prepare for administration Inderal 10mg TID (Three Times a Day) instead of Isordil 10mg TID.

[The four sub questions presented in figure 2 are asked after each statement below as for the medical staff.]

- A. The checking nurse detects the error prior to the patient receiving the wrong medication.**
- B. The error is detected by fellow nursing staff after the patient receives the wrong medication for 24 hours. The patient suffers no adverse outcome resulting from this error.**
- C. The error is detected by the doctor after the patient becomes haemodynamically unstable and is transferred to the ICU (Intensive Care Unit). The patient suffers no permanent adverse outcome resulting from this error.**
- D. The error is detected by the doctor after the patient becomes haemodynamically unstable and is transferred to the ICU. The patient dies several days later resulting from this error.**

### Scenario #2

You mis-programme an infusion pump for a heparin infusion. The misprogrammed dose is 10 times greater than the prescribed dose.

- A. The error is detected by you prior to the patient receiving the wrong infusion.**
- B. Same scenario, but the error is detected by a fellow staff member after the patient receives the wrong dose for 24 hours. The patient suffers no adverse outcome resulting from this error.**
- C. The error is detected when the doctor questions the nursing staff, due to the patient having a large gastrointestinal haemorrhage and increased APTT (Activated Partial Thromboplastin Time) ratio. The patient is being transferred to the ICU. The patient suffers no permanent damage resulting from this error.**
- D. The error is detected when the doctor questions the nursing staff due to the patient having a gastrointestinal haemorrhage and increased PTT ratio. The patient is transferred to the ICU. The patient dies several days later resulting from this error.**

**Please briefly explain below why, in your opinion, medication errors are gathered and investigated.**

Questions on praise for reporting errors as for medical staff.

Questions on employment duration similar to those for medical staff.

Are you employed as:

\_\_\_\_\_ a Ward Sister  
 \_\_\_\_\_ a Staff Nurse

Do you work in:

- \_\_\_\_\_ an inpatient nursing unit?
- \_\_\_\_\_ an outpatient nursing unit?

Questions on working in adult or paediatric services as for medical staff.

Questions on having ever reported a medication error as for medical staff.

### Appendix III—Pharmacist's Questionnaire

#### Scenario #1

You receive a prescription, written for a 50 year old man who has been admitted with congestive heart failure. You mistakenly dispense Inderal 10mg TID (Three Times a Day) instead of Isordil 10mg TID. (The correct label is placed on the box, but the wrong drug is placed inside).

[The four sub questions presented in figure 2 are asked after each statement below as for the medical staff.]

- A. The nurse administering the drug detects the error prior to the patient receiving the wrong medication.**
- B. The error is detected by nursing staff after the patient receives the wrong medication for 24 hours. The patient suffers no adverse outcome resulting from this error.**
- C. The error is detected by the doctor after the patient becomes haemodynamically unstable and is transferred to the ICU (Intensive Care Unit). The patient suffers no permanent adverse outcome resulting from this error.**
- D. The error is detected by the doctor after the patient becomes haemodynamically unstable and is transferred to the ICU. The patient dies several days later resulting from this error.**

#### Scenario #2

You receive a telephone call on a Saturday morning to prepare a high dose methotrexate infusion for a paediatric patient. In producing the labels and worksheet you choose the incorrect regimen and hence an incorrect infusion rate. The infusion rate is 10 times greater than the prescribed rate.

- A. The error is detected by you prior to the patient receiving the wrong infusion.**
- B. Same scenario, but the error is detected by a staff nurse after the patient receives the wrong dose for 30 minutes. The patient suffers no adverse outcome resulting from the error.**
- C. The error is detected by the doctor after four hours. The patient has gone into renal failure and is being transferred to the ICU. The patient suffers no permanent damage resulting from this error.**
- D. The error is detected by the doctor after four hours. The patient has gone into renal failure and is being transferred to the ICU. The patient dies several days later resulting from this error.**

**Please briefly explain below why, in your opinion, medication errors are gathered and investigated.**

Questions on praise for reporting errors as for medical staff.

Questions on employment duration similar to those for medical staff.

Questions on working in adult or paediatric services as for medical staff.

Questions on having ever reported a medication error as for medical staff.

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