

Sensitivity of routine system for reporting patient safety incidents in an NHS hospital: retrospective patient case note review

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BMJ 2007;334:79-81

doi: 10.1136/bmj.39031.507153.AE

ABSTRACT

Objective To evaluate the performance of a routine incident reporting system in identifying patient safety incidents.

Design Two stage retrospective review of patients' case notes and analysis of data submitted to the routine incident reporting system on the same patients.

Setting A large NHS hospital in England.

Population 1006 hospital admissions between January and May 2004: surgery (n=311), general medicine (n=251), elderly care (n=184), orthopaedics (n=131), urology (n=61), and three other specialties (n=68).

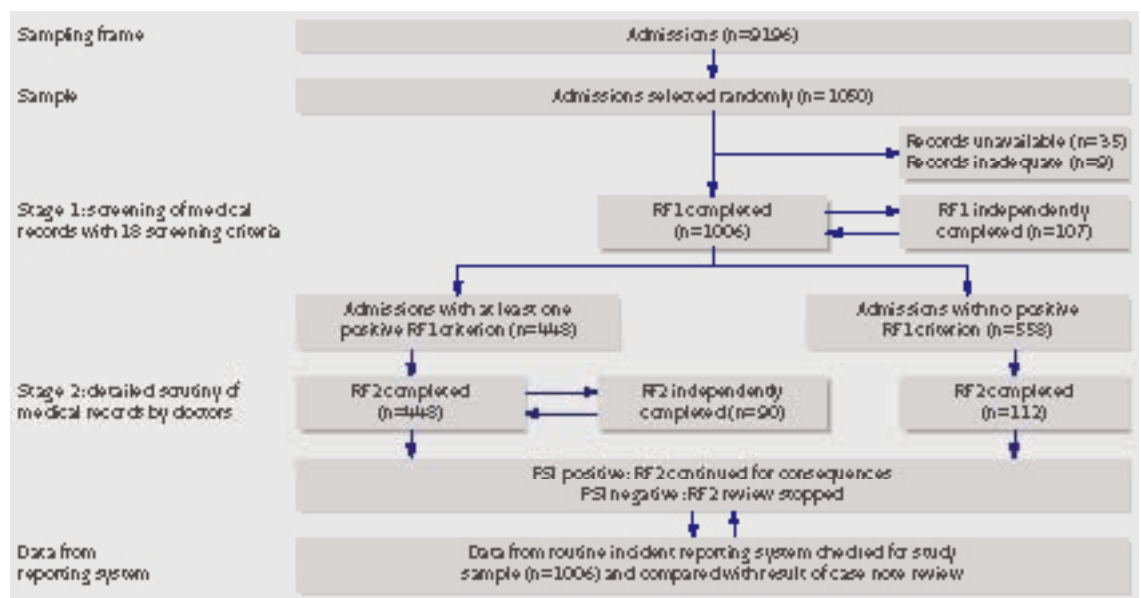
Main outcome measures Proportion of admissions with at least one patient safety incident; proportion and type of patient safety incidents missed by routine incident reporting and case note review methods.

Results 324 patient safety incidents were identified in 230/1006 admissions (22.9%; 95% confidence interval 20.3% to 25.5%). 270 (83%) patient safety incidents were identified by case note review only, 21 (7%) by the routine reporting system only, and 33 (10%) by both methods. 110 admissions (10.9%; 9.0% to 12.8%) had at least one patient safety incident resulting in patient harm, all of which were detected by the case note review and six (5%) by the reporting system.

Conclusion The routine incident reporting system may be poor at identifying patient safety incidents, particularly those resulting in harm. Structured case note review may have a useful role in surveillance of routine incident reporting and associated quality improvement programmes.

INTRODUCTION

Patient safety incidents (defined as any unintended event caused by the health care that either did or could have led to patient harm) have been shown to cause harm in between 3% and 17% of hospital inpatients.¹⁻⁵ After the development of the national risk management standards in 1995, most NHS hospitals in England and Wales established reporting systems as part of their risk management programme.⁶ People involved in or witnessing a patient safety incident complete a form that is sent to the local reporting system, where the incident is classified and entered into a database.⁷ The National Patient Safety Agency developed a national reporting and learning system in 2003 to collate reports of patient safety incidents from local organisations.⁸ This system aims to help the NHS to learn from patient safety incidents and to



Summary of case note review process. RF1=review form 1; RF2=review form 2

This is the abridged version of an article that was posted on bmj.com on 15 December 2006. Cite this version as *BMJ* 15 December 2006, doi: <http://bmj.com/cgi/doi/10.1136/bmj.39031.507153.AE> (abridged text, in print: *BMJ* 2007;334:79-81)

Type of patient safety incidents recorded by case note review (CNR) and routine adverse incident reporting system (AIRS). Values are numbers (percentages)

Type of patient safety incident	Detected by combination of methods	Detected by CNR*	Detected by AIRS*	Missed by AIRS	Detected by both methods*
Group I incidents†:	139	118 (85)	54 (39)	85 (61)	33 (24)
Pressure ulcer	13	13 (100)	3 (23)	10 (77)	3 (23)
Fall	52	48 (92)	29 (56)	23 (44)	25 (48)
Drug problems	24	19 (79)	7 (29)	17 (71)	2 (8)
Operation cancelled	4	4 (100)	0	4 (100)	0
Intraoperative/postoperative complications(except infection)	5	5 (100)	0	5 (100)	0
Patient dissatisfaction	17	17 (100)	0	17 (100)	0
Other group I incidents	24	12 (50)	15 (63)	9 (38)	3 (13)
Group II incidents‡:	127	127 (100)	0	127 (100)	0
Unplanned transfer to ICU	13	13 (100)	0	13 (100)	0
Unplanned return to operation	4	4 (100)	0	4 (100)	0
Inappropriate/self discharge	25	25 (100)	0	25 (100)	0
Unplanned readmission	85	85 (100)	0	85 (100)	0
Group III incidents (infection)	44	44 (100)	0	44 (100)	0
Admission with at least one group I, II, or III incident	230	209 (91)	54 (23)	155 (67)	33 (14)
Total incidents	324	303 (94)	54 (17)	270 (83)	33 (10)

ICU=intensive care unit.

*Percentages are of total number of patient safety incidents (PSIs) reported by both methods. Because some admissions had more than one PSI recorded, total number of PSIs is greater than total number of records with at least one PSI.

†Incidents always expected to be reported by AIRS.

‡Incidents not necessarily reported by all organisations.

identify trends and patterns relating to patient safety.^{8,9} In this paper we evaluate the relative performance of a local routine incident reporting system, by comparing it with a well validated method of systematically reviewing case notes.¹⁻³

METHODS

We did the study in a large NHS hospital trust in England in 2005. We selected a stratified random sample of 1006 admissions between January and May 2004 from eight specialties: surgery; urology; orthopaedics; general medicine; medicine for the elderly; oncology; ear, nose, and throat; and ophthalmology. The study consisted of a two stage retrospective case note review of the sample admissions and a review of the patient safety incidents reported by the routine hospital reporting system for the same admissions (figure).

Review of medical records

Five trained nurses screened patients' records by using 18 criteria (see bmj.com). We used one (or more) positive criterion as an indicator of a patient safety incident and scrutinised these medical records in stage two. In stage two, three trained hospital doctors reviewed the records that had one positive criterion in stage one. The doctors used a structured review form to judge if a patient safety incident had occurred and to assess its type and consequences.

Review of patient safety incidents reported by routine reporting system

We inspected data on the routine adverse incident reporting system for the 1006 admissions in our sample. We calculated the number, percentage, and

type of patient safety incidents identified by the case note review and routine reporting system and classified them into three groups according to the routine reporting system (table). We calculated the proportion of admissions with patient safety incidents identified by each method and the proportion of these incidents that were judged to have caused patient harm for each method.

RESULTS

Patient safety incidents—According to a combination of case note review and the reporting system, a total of 324 patient safety incidents were reported in 230 of the 1006 admissions (22.9%; 95% confidence interval 20.3% to 25.5%). Case note review identified 303 (94%) of the 324 incidents. The reporting system identified 54 (17%) of the total number of patient safety incidents (table).

Patient safety incidents causing harm to patients (adverse events)—Of the 1006 admissions, 110 (10.9%; 9.0% to 12.8%) had at least one patient safety incident resulting in harm to the patient (a total of 136 adverse events). In other words, 42% of patient safety incidents resulted in adverse events, of which all were detected by the case note review and 6 (5%) by the reporting system. All 21 patient safety incidents missed by case note review were minor, whereas 130 (44.7%) incidents missed by the reporting system led to patient harm.

DISCUSSION

We found that 23% of hospital admissions in eight specialties were associated with patient safety incidents and 11% with adverse events. This is similar

WHAT IS ALREADY KNOWN ON THIS TOPIC

Patient safety incidents are common in inpatients, and many of them lead to patient harm or extra cost
 Effective strategies are needed to identify, analyse, and learn from these incidents
 Case note review is useful but expensive for routine use; routine reporting systems have been introduced in several countries

WHAT THIS STUDY ADDS

Routine incident reporting systems may significantly under-report patient safety incidents, particularly those resulting in harm
 Structured case note review may have a role in surveillance and the monitoring of reporting systems

to rates found in studies using similar methods in the United Kingdom (10.8%)¹ and internationally (7.5% to 16.6%)²⁻⁵

The routine reporting system as implemented in this large hospital missed most patient safety incidents that were identified by case note review and detected only 5% of those incidents that resulted in patient harm. This suggests that the routine reporting system considerably under-reports the scale and severity of patient safety incidents.

Strengths and weaknesses

Structured case note review, when carried out by trained professionals, has been shown to reliably detect adverse events.^{1-3 6 10} The reviewers in this study were specifically trained, and inter-rater reliability was good at both stages¹¹: 84% between nurses in the first stage ($\kappa=0.67$) and 90% between doctors ($\kappa=0.76$) in the second stage.

This study is based on data from one large hospital, where the performance of the incident reporting system may differ from that in other hospitals. However, this trust is a high reporter to the national reporting and learning system and the distribution of the types of patient safety incidents detected in this study was similar to that found in a recent analysis of patient safety incidents from 230 NHS organisations.⁸ This suggests that our results are generalisable.

Meaning of the study

Our study provides empirical evidence that the data collected by the national reporting and learning system may be biased. This is unlikely to be caused by teething problems, as the national reporting system was designed to complement pre-existing local reporting arrangements.⁷ Voluntary reporting systems may under-report incidents, owing to lack of feedback; time constraints; fear of shame, blame, litigation, or professional censure; and unsatisfactory processes.¹²⁻¹⁶

The results do not mean that the early themes emerging from the analysis of the national reporting and learning system data are not useful,⁸ but estimates of the type and severity of incidents are likely to be biased. More importantly, perhaps, the value of these

data locally as a component of safety programmes is questionable.

Future research

More research is needed to help to develop a reporting system that is capable of providing an accurate picture of the type, nature, and severity of incidents and at reasonable cost. We need to develop and evaluate cost effective ways in which good data monitoring can be used as part of quality improvement.

Conclusion

The routine incident reporting system may not provide an accurate picture of the extent and severity of patient safety incidents, particularly those resulting in harm to patients. Healthcare organisations should consider routinely using structured case note review on samples of medical records as part of quality improvement.

We thank Alan Maynard, Mike White, and Michael Porte for their support and advice. We also thank for their advice Denis Smith, Carl Thompson, Fiona Fylan, Richard Lilford, Charles Vincent, Graham Neale, Maria Woloshynowych, Martin Bland, Jeremy Miles, Ian Woods, Ann McEvoy, Donald Richardson, Glen Miller, Caroline Mosely, Dawn Taylor, Mary Nannary, and Sally Grabham. We are also grateful to clinical and administrative staff of the host hospital for their support.

Contributors: See bmj.com.

Funding: AB-AS was supported by a scholarship from the Iranian Ministry of Health and now works at the School of Public Health, Teheran University of Medical Sciences. All the researchers are independent from the Iranian Ministry of Health.

Competing interests: None declared.

Ethical approval: Hospital research ethics committee (reference number O4/Q1108/7).

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Accepted: 3 November 2006