

The Establishment of an Electronic Opportunity Reporting System for Patient Safety at King Fahad Medical City Saudi Arabia

Dr. Abdulrahman Bashik and Ms. Ranyah Aldekhyyel

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Key Words

Electronic Reporting System, Quality Tools, Quality Improvement.

Abstract

When the Quality Management Department at King Fahad Medical City was looking into automating the tool which was used for collecting incident reports, the department was faced with more than automation of the reporting form. Challenges which were faced included the need to develop a safety blame free culture, a new tool for reporting, and an organizational arrangement for multidisciplinary collaboration to deal with such reports. The strategies for change included developing an electronic opportunity reporting system with all the required arrangements for the system to be implemented such as establishing the different quality improvement committees and quality representatives in each respective area with their roles clearly defined to integrate efforts. As a way to change the culture and increase reporting, staff education, open communication and feedback measures were established.

As a result of implementing the new system, an increase in reporting by all hospital staff has been observed. Staff are more comfortable in reporting knowing that they will not be blamed or punished and their participation in educational seminars has been dramatically improved.

Introduction

Safety, the first domain of quality, refers to "freedom from accidental injury." Health care is not as safe as it should be due to a great deal of variability in medical practice and, oftentimes, a lack of adherence to medical standards based on scientific evidence. ¹

A substantial body of evidence worldwide points to medical errors as a leading cause of death and injury. As indicated in the World Alliance for Patient Safety Forward Programme 2006-2007, "an estimated sixty-three million people a year require surgical treatment for traumatic injuries, thirty-one million for malignancies, and ten million for obstetric complications". ²

When reviewing the medical errors in the USA only, in each of the years 2000, 2001 and 2002 an average of 195,000 people died due to potentially preventable, in-hospital medical errors, according to a new study of 37 million patient records that was released by HealthGrades, the healthcare quality company. ³

In Canada an adverse event rate of 7.5% suggests that of the almost 2.5 million annual hospital admissions ,about 185,000 are associated with an adverse event, and close to 70,000 of these are potentially preventable. ⁴

In Saudi Arabia, in August 2007 Dr. Hamad Al-Manie, the Minister of Health, opened a seminar on raising the quality of health care in Arab countries, an event attended by Health Ministry representatives from other Middle East countries. In the event Dr. Al-Manie stated that “Many medical errors, whether they are individual ones or not, are made because of not applying a quality criteria. So we are persistent that we apply quality measures in all hospitals and health care centers.” ⁵

One of the quality measures that must be put in place to monitor the unwanted medical errors in health care organizations is by establishing a reporting system to document data related to medical errors and sentinel events. Occurrence, incident, or variance reports, regardless of what they are named in different healthcare organizations, are reporting systems used by health care organizations to internally document unusual events which occur to the patient and may have a direct effect on patient safety. Analysis and trending of reported data provide means to drive process improvement and patient safety initiatives. Reporting can also meet certain external agency requirements such as the Ministry of Health and the Joint Commission International Accreditation. If hospitals in Saudi Arabia are seeking to be accredited, they must have a system in place for reporting unwanted medical errors. In the United States in 1995, hospital-based surveillance was mandated by the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO). ⁶ As indicated by the Joint commission, health care organizations and the Joint Commission must continue to address serious adverse events that are reported. They continue stating the importance of these systems “This data also supports the importance of establishing National Patient Safety Goals and focusing our energies on addressing serious errors within health care organizations. By identifying causes, trends, settings and outcomes of sentinel events, The Joint Commission can provide critical information in the prevention of sentinel events to accredited health care organizations and the public”. ⁷

Methods

Outline of the Problem

King Fahad Medical City (KFMC) is a four-hospital, four-center, 1,095-bed medical facility, which opened officially in October 2004. It is the largest in the Middle East, built at a cost of over \$600 million. The reporting method of medical errors that was being used was a paper based incident report form which was provided by the Ministry of Health. The forms were mostly used by nurses; when an unusual event is discovered, a nurse completes a paper based form and the head nurse will review it. The Form would then be sent to the Nursing Department for analysis and trending. Many issues had an

effect on the effectiveness, efficiency and timeliness of these reports. There was only an individual effort being done to overcome the event being reporting.

Strategies for Change

In Early May 2005, the Quality Management Department assessed the facility's process for reporting unwanted events then spent five months in literature review and designing of a new electronic version of reporting of unwanted events.

Three critical conditions for a well functioning reporting system were lacking at that time:

- (1) An open blame free culture among the staff with a belief that organizational learning from the errors of systems is essential for improvement;
- (2) A tool for hospital-wide collection of information regarding actual or potential unwanted events: only the Nursing Department had been gathering incident reports but had not shared them or resolved common problems with other wards and departments.
- (3) A systematic way in dealing with such reports which involves different multidisciplinary committees and managers.

The main objective was to design a hospital-wide electronic reporting system to collect data on variant practices that will help facilitate the reporting of events for better communication and improvement. We wanted to change the mind-set of all staff working in KFMC especially nurses and physicians towards reporting of unwanted events occurring in the hospital and we aimed to train Directors and Heads of Departments not only in using the system but also in viewing reports as a key element for quality and safety rather than as an individual performance or disciplinary measure.

Development of the System and Related Components

At the beginning of the development stages, we choose to name the reporting system in KFMC the “Opportunity Reporting System” (ORS). The idea behind the name came from the need to transform the mind set of staff, in viewing reporting of unwanted events, from a negative point of view to a positive one. The name reflects that in every unwanted event occurring in the organization, there is an opportunity for improvement, and this reporting system was designed to capture these opportunities for improvement based on the unwanted events that occur, or may occur in the future, if the processes of work do not change. The differences between the traditional incident report and the new ORS is presented in (Box 1).

Box 1 Difference between the traditional incident report and the ORS

Traditional incident report:

- Paper based.
- Usually targets the individual.
- Uses negative terms which cause reporters to feel fear from reporting.
- Used to capture retrospective data regarding negative patient outcomes, to prevent duplication of the error.

Opportunity Reporting System:

- Electronic system.
- Targets systems for purpose of improvement.
- Uses positive terms which cause reporters to feel safe and confident to use the system.
- In addition to capturing retrospective data, the reporter notes the conditions and factors that created a potentially harmful situation, even if a negative outcome did not result.

The categories, for reporting, that were needed in the electronic form were evaluated. We needed to make sure that the terminology being used in each element reflects the positive approach of the system. Some questions on the old paper based incident form were not useful; others needed reformatting and other questions needed to be added. Input based on the literature review and key individuals from various departments was carried out during this process.

To enhance the feeling that end users were part of the improvement system, questions that were related to their evaluation on the event and their suggestions for future improvement were added at the end of the form. A thank you note was also sent to them via email for their contribution to the system and when information is collected related to the event, the reporter is sent a feedback on what has been made in response to the report. When choosing a host for the Electronic Opportunity Reporting system, the Quality Management Department worked with the Information Technology Department and decided to use the existing framework: KFMC 's intranet, which contains departmental Web pages, online resources, and news. The intranet was readily available to all staff from any personal computer across the facility. The major advantages were complete control of sensitive data on KFMC's server and the ability to direct and modify the application based exclusively on the needs of the facility.

Quality committees were established and quality representatives were assigned in each Hospital/Center and Department. Quality representatives are staff assigned from various directors of departments to serve as facilitators, between the Quality Management Department and their respective department, in issues that were related to quality

improvement which includes managing the reports received from the Opportunity Reporting System. A method for responding to sentinel events was implemented which included Root Cause Analysis Sessions. The forms that are being used for these sessions were adopted online from the Joint Commission International Center for Patient Safety.

Results

Implementation of the System

In October 2005, phase I was implemented and before the system went live, a policy and procedure related to the opportunity reporting system was established, approved and published on the intranet. KFMC staff were able to access the system from every computer located within the organization. However access to the database for data retrieval and analysis is highly restricted and limited to Quality Management individuals based on their assigned security rights. When the reports are submitted, an individual staff from Quality Management will receive a message on her/his pager to indicate that a new report has been submitted. She/ he then accesses the database, screens the report and forwards it, via email, to the related Quality Representative according to his or her defined areas of responsibility in order to provide proper feedback and input in relation to the event being reported.

Phase II of the system was implemented during two stages. In April 2007, new categories to the user side of the form were introduced. These categories were related to reporting opportunities for improving non clinical administrative issues. During the end of December 2007, the second stage was implemented, which was concerned with three major issues. The first was automating other hospital forms and including them in one system, which is the ORS in order to have the same application and the same look to be available from a single intranet screen and also to eliminate the use of paper forms. These forms included the medication forms as well as the safety and security forms. The second was related to implementing the administrative management side of the reports which will be used by managers and quality representatives giving them unique security privileges based on their areas of responsibility. At any time, they can look at composite results, isolate an individual report, and review new, pending, and closed records that are related to their department. They can also add follow-up comments without compromising the integrity of the original data. The third issue which was implementing during stage two is related to the automatic routing of the reports. The reports are forwarded by the system according to specific coding and algorithms which is assigned to each category in the report and built in the system.

Education and cultural changes

Over 100 in-service training classes for hospital staff were presented on various days using demonstrations. The total number of nurses that were educated was 940 and the

total number of medical and para medical staff was 345. The education sessions are also a part of the monthly General Nursing Orientation (Table 1). These educational sessions gave the opportunity to begin changing the culture from a negative culture which was associated with fear from reporting to a positive blame free environment.

Table 1 Number of staff attending the educational classes	
Type of Class	Number of staff
ORS Class (All Employees)	
Medical Staff	133
Para Medical Staff	212
Nursing Staff	940
General Nursing Orientation Class	
January	47
April	51
June	66
July	102
August	102
September	133
October	26
December	60

Discussion and Conclusion

There has been a continuing educational effort to emphasize reporting as a means to quality, safety, and process improvement, not just to document errors or assign blame. System oriented improvement focusing on root causes of events has been emphasized the most among preventive efforts. To encourage the staff to make continuous efforts for patient safety, feedback is made available through emails. Changes have then been made when necessary.

Effects of Change

Several positive changes have been observed since the strategies were implemented. The Electronic Opportunity Reporting System has encouraged participation of all hospital staff in reporting unwanted events and the total number of submitted reports has increased (Table 2).

The characteristics of the electronic opportunity reporting system, which include a lower psychological barrier due to undisclosed reporter as well as easier access and shorter input time for reports, seem to promote reports on a continuous basis from various disciplines. Before the introduction of the electronic system nurses had submitted an average of 10 reports monthly. After implementing the system in October 2005 both the number of reports using the paper based or the electronic ORS has dramatically increased showing an average of 58 reports monthly. Incident reports were being continually submitted by nurses along with the electronic opportunity reports only between the

months of October to December 2005. They continued to use both forms of reporting, paper and electronic, so the transition to the electronic system would be smooth. During the beginning of year 2006, paper based forms were no longer accepted.

The nature of reports being submitted were both clinical and non clinical issues. During the month of April 2007 the number of reports has increased (total of 175) about double of the reports from the month before, because the system accepted reporting of administrative opportunities.

Table 2 Number of reports received using the traditional incident report and the ORS from July 2005 until December 2007

Month, Year	Number of Reports	Percentage (%)
Traditional Incident form		
July, 2005	6	7.1%
August, 2005	15	17.6%
September, 2005	10	11.8%
October, 2005	32	37.6%
November, 2005	14	16.5%
December, 2005	8	9.4%
Total	85	100%
ORS		
October, 2005	10	1.4%
November, 2005	9	1.3%
December, 2005	19	2.7%
January, 2006 (2007)	18 (56)	2.6% (5.1%)
February, 2006 (2007)	36 (83)	5.2% (7.6%)
March, 2006 (2007)	45 (88)	6.5% (8.1%)
April, 2006 (2007)	58 (175)	8.3% (16.1%)
May, 2006 (2007)	67 (150)	9.6% (13.8%)
June, 2006 (2007)	74 (86)	10.6% (7.9%)
July, 2006 (2007)	82 (80)	11.8% (7.3%)
August, 2006 (2007)	45(88)	6.5% (8.1%)
September, 2006 (2007)	48(83)	6.9% (7.6%)
October, 2006 (2007)	39(60)	5.6% (5.5%)
November, 2006 (2007)	73(68)	10.5% (6.2%)
December, 2006 (2007)	72(73)	10.4% (6.7%)
Total	695 (1090)	100%

Reporters especially nurses tended to report any variant care including near misses and potential events which did not affect patients. On the other hand, physicians tended to report actual events that happened and were recognized.

The Department of Quality Management aggregate the data on a monthly basis and report quarterly to the Medical Executive Council in order to discuss the various improvement projects and action that need to be done in response to the reports. The reports are also discussed monthly in the Hospital/Center or departmental quality improvement committees to come up with improvement projects. However sentinel events are dealt

with as a single event. Response of the quality management staff is by conducting a root cause analysis session with 2 days of the event with the related disciplines and recommended actions are documented and sent to the executive medical director within 7 days for approval of actions.

Other effects of change have been noticed since the implementation of the new system, a summary of the effects of change are presented in (Box 2).

Box 2 Summary of Effects of change
<ul style="list-style-type: none">• Both the number of reports and the timeliness of reports improved.• Communication among directors and head of departments was enhanced.• Change in the attitude of reporting of unwanted event was noticed by the number of potential reports that were received.• Culture of reporting changed from fear of reporting to a culture of supporting quality improvement in terms of reporting unwanted events.

To sustain and improve reporting, all levels of the organization must continually reinforce the message that reporting is not about blame or punishment. Rather, it is key to promoting a culture of quality and safety. All employees must see reporting as a routine responsibility of their jobs and feel secure in reporting. Such a mind-set requires not only ongoing formal education but also demonstration of this commitment in both words and actions by all members of the organization, especially leadership.

The KFMC, Electronic Opportunity System has made a lot of positive reputation not only in the organization itself, but also in outside organizations such as the Ministry of Health. As a result the Quality Directorate in the Ministry has asked to implement the System National wide and an agreement has already been reached between the two organizations. Further studies should be done to measure the satisfaction levels of staff within KFMC with the ORS and a study to show the improvement projects that have been implemented as a result of the reports from the system.

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