Computerized Incident Reporting: An Example of Healthcare IT For the 21st Century

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Discussion of the Issues

At a time when hospitals and health care organizations across the country are attempting to navigate in a relatively new business environment of competition, cost containment and corporate compliance, growing concerns of patient safety loom in the eyes of the public. Despite the longstanding realization that the delivery of patient care is far from exact, nearly every organization has struggled for years to minimize the risks of errors and accidents with little wide reaching success.

To enhance patient safety, ongoing improvements in procedures, equipment availability, staff competencies and staffing ratios are likely to be needed. To identify which improvements are necessary, errors and accidents must be promptly reported and thoroughly investigated. For prompt and thorough investigations to occur, there must be immediate knowledge of such events. To foster this crucial cycle for improvement, health care organizations must shed outdated modalities and management approaches and replace them with real-time information systems and workplace ownership for improvement.

Review of Literature

Undoubtedly, the first Institute of Medicine (IOM) Report published on medical errors lifted the healthcare industry's long time struggle with medical errors/accidents to the forefront. In citing medical errors as the eighth leading cause of death in the U.S., the IOM report captured the attention of the media, legislators and medical researchers alike. Dr. Clement McDonald et al disputed the accuracy of data referenced in the IOM report, yet concurred that there is a need for medical error reduction. Although medical error is but one of many issues facing healthcare facilities, public knowledge and scrutiny of medical errors can have a profound effect on an organization's reputation and operations. This fact has been well proven in recent years with several highly publicized events involving wrong site surgery and medication errors.

The Joint Commission for Accreditation of Health Care Organizations (JCAHO) has continued to refine accreditation standards to address sentinel event review procedures. The agency has done so in an obvious attempt to ensure that accredited hospitals and health care agencies conduct timely and comprehensive investigations to seek root causes in serious patient errors. To promote timely intervention in response to error, immediate notification of occurrences is of paramount

importance. Such notification can be achieved through information technology.

Applegate, McFarlan and McKinney cite information technology (IT) as a vital key to streamline, integrate and time-synchronize internal processes to transform an industry. They noted that needs for rapid turnaround of information signal a high priority for IT applications. Healthcare incident or event reporting is indeed one of those priorities.

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Incident reporting is not a new concept. Reporting of medical errors and accidents dates back to the 1970's when healthcare risk management concepts were born out of the country's first malpractice crisis. Unfortunately, reporting systems have been plagued for nearly thirty (30) years with problems of inaccuracy, inefficiency and ineffectiveness.

Elnitsky et al contended in their study of fifteen (15) acute care hospitals that there was gross under-reporting of errors due to flawed reporting processes. Confusion among employees about what events to report was compounded by inconsistent management interventions. They found that employee reprimand for errors created tremendous barriers to effective reporting.

Sutton and her colleagues discovered other complicating factors. Through a prospective study of patient accidents, Sutton and her associates found that patient and staff versions of the same accident were vastly different, particularly with regard resulting injury and contributing factors. They concluded in 1994 that streamlined reporting processes should be developed.

Gloria Wenzel advocated automated systems in 1997. She noted that careful development of automated tracking systems could produce data that was more accurate and therefore lead to more thorough investigation and corrective actions. Mary Sue Golden concurred with that strategy.

At Good Samaritan Hospital in Vincennes, IN, in 1998, Golden and her hospital colleagues created a computerized method for incident reporting. Their data showed that corrective follow-up actions completed within two (2) weeks of the incident increased from 70 percent to nearly 100 percent when computer processes were fully implemented.

Scott Lange, Risk Manager for Microsoft, Inc., spoke frankly during his keynote address at the nineteenth annual meeting of the Association for Healthcare Risk Management (ASHRM) in 1998. He stated, "I would diagnose healthcare today as suffering from outdated information technologies. The healthcare industry must work to have instantaneous information available." Lange was critical of patient information systems in general.

And most recently, the latest IOM report released on March 1, 2001, underscored that IT is one of many areas that continues to be severely lacking in healthcare. When vital information about patients and their care management is manually scribed between healthcare providers through multiple service encounters, there is really little question as to why or how errors occur. Of even greater concern is

the fact that when there is an error or accident, many health care organizations may not recognize the fact that the event has occurred for a period of days following.

Description of the Solution

Hendricks Community Hospital (HCH) has created and implemented a real-time system that appears to be a very promising tool for rapid identification of events and near miss situations to analyze to ultimately increase patient safety. In 1997, a multidisciplinary group of employees at HCH developed a computer application in Microsoft Access to allow electronic reporting of adverse events involving patients, employees, and visitors. The system was radically different from previous paper forms that had been used.

By simply clicking a button on a main menu screen, customized event reporting forms can be accessed. Drop-down menu options and required fields were programmed to maximize user ease and enhance data consistency. Instant messages were also programmed to assist users in completing report requirements.

Manager prompts were devised to alert managers of reports that have been filed involving their respective area(s). All reports were designed to route to the risk manager. The system allows for quick identification of significant events that may require immediate patient/family intervention and/or root cause follow-up. Centrally, the risk manager assigns injury severity to each event, those involving significant injury are triggered electronically to forward to Administration.

The system was initially piloted on one inpatient unit and within two hospital departments for a period of three months. Results were overwhelmingly positive and the system was ultimately implemented house-wide on October 1, 1999. An educational blitz for administration, management and current employees on the importance of incident reporting was conducted prior to house-wide implementation. Currently, the point of use system is available at any computer station that is connected to the network mainframe.

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Description of Outcomes

Comparison of pre and post-implementation data has shown remarkable results. Of the 2757 incident reports filed using the previous manual paper system from January 1997 through May 1998, 2095 (34 percent) were received in risk management within three days after the event. Of the 951 incidents filed electronically from January through December 2000, 826 (87 percent) were received within three days of event, usually within the same day (see Figure 1). Management follow-up actions had been completed within three days in 425 (45 percent) of the incidents reported. Notably, the volume of medication errors reported has continued to increase (see Figure 2 on page 18).

Figure 1

Report Turnaround Times

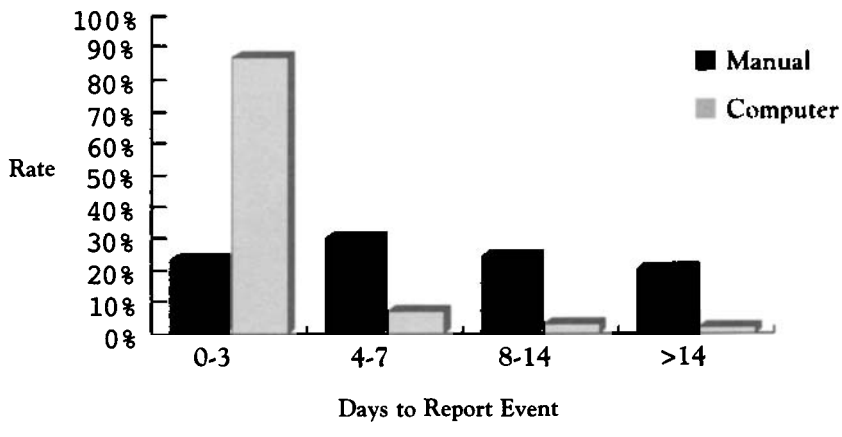
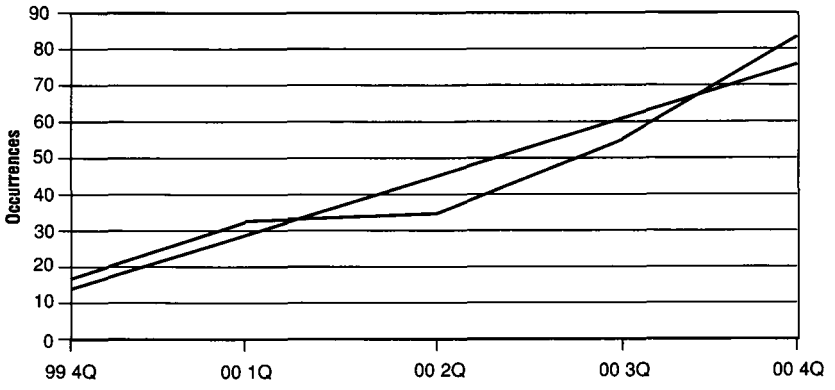


Figure 2

Incident Report System Medication Error Occurrences



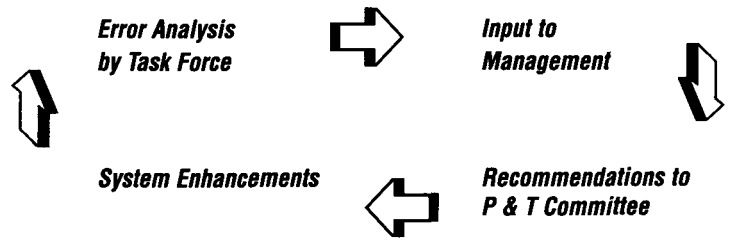
It is the consensus of the employees, management and the medical staff that this trend is a direct result of improved reporting and strongly suggests that errors were grossly under reported in the past. The ability to trend aggregate data as well as detailed data by incident has been greatly enhanced.

In March 2000, HCH convened a medication error task force to concurrently examine the anatomy of medication/IV errors and adverse drug events.

In March 2000, HCH convened a medication error task force to concurrently examine the anatomy of medication/IV errors and adverse drug events. The task force is comprised of staff nurses, pharmacists and respiratory therapists who meet biweekly to review events reported. Their mission is to identify process improvements, large and small, which could serve to maximize medication safety for patients and get rid of processes that can contribute to human error. They examine not only errors that reach the patient, but also ones that are detected prior to the administration of the medications, e.g. wrong medications dispensed from pharmacy. Over the past year, the task force has advocated several procedural changes for the pharmacy, nursing services and physician order writing (see Figure 3).

Figure 3

Better Data = Better Processes



Similar task forces have since been activated to examine patient and employee injuries. Aggregate incident data displays are presented quarterly to both the safety and quality committees. Such detailed and concurrent examination of errors was not possible prior to the initiation of the electronic database system.

Improved risk management work efficiencies have also been realized. The system has eliminated the need for clerical entry of manual reports. Reducing the number of data manipulations has increased the overall security and data integrity of the reports filed. As simply as reviewing electronic mail, the risk manager can review incidents that have occurred throughout the organization. Report queries have been programmed to allow managers to produce incident trend reports as frequently as they desire.

Hands-on training and education on the importance of fostering a safe healthcare environment have been incorporated into the first day of new employee orientation at HCH for over one year. Regardless of job title or responsibilities, all new employees receive education and training on incident reporting. As new employees, they are then sent the distinct message that patient, employee and visitor safety, are indeed top priorities for the organization and hence part of its culture.

Implementing such an extraordinary system has been both exhilarating and frustrating. Previous concerns of the loose handling or careless copying of incident reports has been completely eliminated with the electronic system. Automation has therefore helped to enhance the security of patient incidents to better ensure peer review protection. Significant shifts in management paradigms on incident reporting were needed, however, for the system to be successful.

Managers at HCH have accepted the fact that any employee may file reports on adverse events, errors or accidents twenty-four (24) hours per day. This has required the managers to trust that, with proper training and awareness, associates can enter data electronically without managerial pre-screen of the information.

Managers must also foster the commitment that in order to promote adequate reporting of errors and accidents, incident reporting must not be used routinely as a punitive device for employee reprimand. To support this non-punitive mindset, management data screens are arranged to force managers to first examine other factors that might have contributed to the incident, e.g. staffing, equipment availability, adequacy of training. This was a conscious design to minimize the potential to default solely to actions involving employee discipline. Key strategies were also needed with information systems (IS).

It is very important to first ascertain the degree of overall computerization that currently exists within your organization, as this can be a real determinant of the organization's readiness for such an automated function. There must be an accurate accounting of the hardware that is available in each department, unit or work area and whether it is adequate to accommodate user needs. Decisions regarding IS programming support must be also made.

It is important to determine up front whether the system will be programmed internally or out-sourced. HCH did outsource the programming of this system application. After more than three years of outside programming support, those direct costs have not exceeded 30,000. If the system support is out-sourced, it is vitally important to gain the support of the internal IS staff, as they will be the ones addressing day-to-day system operation questions from employees and managers. Progress meetings scheduled at intervals to include front-line staff, risk management and IS are of immense value in process implementation.

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It cannot be assumed that every department manager is either computer savvy or values increased automation. Risk management and IS must work as a team to seek the continued commitment from managers for use of the technology. It is prudent to ensure that managers are sufficiently trained on the system well in advance of their area employees to provide them with acknowledge to assist their employees in system usage. Adequate initial training with reinforcement at intervals will be more likely to position managers as advocates for the process instead of obstacles. The project served as a textbook example of organizational performance improvement.

Incident reporting had the potential to directly impact patient care and the lack of reporting of incidents can increase patient risk. The existing process at HCH was problem-prone and

affected large numbers of people, both patients and employees. Finally, patient incidents pose real threats for increased costs and liability. Without question, tackling this process served to be a winning proposition for all that were involved. JCAHO then raved about our accomplishments.

During our triennial survey in October 1999, automation of incident reporting was presented as one of our performance improvement initiatives. Despite having had the system operation for only weeks prior to the survey, JCAHO surveyors coined our system as "a unique risk management system that included near miss medication errors." They inquired as to whether administration had any plans to market the application and stated that to date, as a team of surveyors, they had not seen a comparable electronic event reporting system.

Conclusion

In closing, from this risk manager's perspective, progressive IT crafted with the ongoing input of the organization's employees is key to effective healthcare incident reporting. Employee feedback and support is crucial to ultimately decrease errors and accidents. HCH has used employees not only to design the system and enhance it once operational, but also to actively participate in the review of incidents to identify potential patient safety improvements.

Most risk managers would agree that the dollars spent for a technologically advanced event reporting system are nominal when compared to losses that can stem from only one medical error resulting in a poor patient outcome. Hospitals and health care organizations that create cultures that don't just acknowledge human error, but actively engage those who may be involved in errors to work to reinvent delivery systems, will be the ones who succeed in achieving safer patient care for the long run.

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