The Hong Kong Polytechnic University

Department of Industrial and
Systems Engineering

A Study of Reporting and Sharing of Near Miss Knowledge in Healthcare Services in Hong Kong

KONG Che Wah

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DECLARATION OF ORIGINALITY

I hereby declare that this thesis is all my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written, nor material that has been accepted for the award of any other degree or diploma, except where due acknowledgment has been made in the text.

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ABSTRACT

Frequent occurrence of clinical incidents and their under reporting have long been a major concern in patient safety. Numerous organizations and enquirers have expressed views on how adverse incidents may be reduced. Near Miss reporting is one that has been received a great deal of attention.

Near Misses are important sources of information about accident precursors. While schemes for reporting Near Misses have been institutionalized in aviation and many High Reliability Organizations (HROs), such a scheme is less rigorously practiced in the healthcare industry. While Near Miss management is usually associated with error and safety management, there is a growing trend that organizations apply theories of knowledge management to assist the building of a safety culture. Therefore, theories and practices on error management, organizational learning, and safety culture have been reviewed to investigate their significances to Near Miss Management in the healthcare setting.

This research focuses on the study of a patient safety project which aims at promoting Near Miss reporting and sharing between 10 hospitals in Hong Kong. The inter-hospital patient safety project emphasizes the building of both a safety

supporting system and a safety culture inside and among participating hospitals. Strategies are specifically designed to nurture an environment which is favorable to a sustainable safety culture. The author of this thesis joined the project under the Teaching Company Scheme (TCS) of the Hong Kong Polytechnic University, who worked as the Knowledge Management Officer for the project since the project initiation. The author was responsible for the design and implementation of a series of events under the project scope, as well as for the analysis of data. The research elements in the project include both the identification of common risk areas in Hong Kong hospitals and good practices to tackle them, and the study on the change of staff attitude and behavior towards Near Misses. For the purposes, a Near Miss reporting system had been designed and implemented. In addition, two large scale surveys, observations in cross-hospital discussions and Knowledge Cafés, and interviews with management of the hospitals have been conducted to investigate the effectiveness of the strategies and tactics adopted.

Several common hospital high risk areas had been identified during the Project. The top three major risk classes identified were in descending order “Accident (Patient/Visitor)”, “Medication”, and “Communication and Consent”. Among which, “Patient Fall” under the major class “Accident (Patient/Visitor)” were identified as the single greatest risk type. A number of tools and good practices had been

identified through the utilization of the “KMSS Solution Pool” and discussion in Knowledge Cafés.

From the surveys, interviews and observations, it was found that most hospital staff showed more willingness to report to their senior in the later phases of the project. However, changes in staff attitude vary across hospitals. The reasons given are mainly based on the differences in the existing culture and energy devoted to the enforcement of the project by the top management. Activities such as Knowledge Cafés have been used to facilitate sharing of Near Miss experiences among hospitals. It is also suggested that Near Misses incidents can be shared as organizational stories to further stimulate learning. However in the current stage the learning is still limited due to concerns on the risk of public disclosure.

The project has attracted attention from many professionals in the healthcare industry. The learning from the project can provide a good reference for other organizations especially HROs which are considering introducing or improving similar programs.

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1 INTRODUCTION

Frequent occurrence of clinical incidents and their under reporting has long been a major concern in patient safety. Two seminal studies of large samples of hospital admissions, one in New York in 1984 and another in 2 USA states in 1992, provided the foundation on which the Institute of Medicine (IoM, USA) was able to base its estimate that as many as 98,000 people die per year from clinical errors that occur in hospitals in the US. The estimation exceeded the actual number of people who died from motor vehicle accidents, breast cancer, or AIDS in 1999 in the US (IoM, 1999). In another study of the quality of Australian healthcare in 1995, experts estimated that 8.3% of total admissions in Australia encountered adverse incidents that were caused by preventable clinical errors. A retrospective review in the UK revealed similar results (Shaw & Coles, 2001).

There have been numerous suggestions from the public on how adverse incidents may be reduced. Among these, the voice calling for patient safety movements has dominated. The National Patient Safety Agency of the UK produced a safety guide for National Health Services (NHS) staff named “Seven steps to patient safety” in 2003, which included the necessary models and frameworks for patient safety.

However research in patient safety is still relatively new compared to other high-risk fields including chemical and nuclear industries (Barach & Small, 2000). Experiences from fields apart from healthcare have helped much in current safety research in healthcare. The pioneer researches of Herbert Heinrich (1941) in industrial accidents since 1930's have provided later researchers with a solid basis for related research. Current researchers in industrial safety including James Reason (1990) and Tjerk van der Schaaf (1991) have developed a comprehensive safety diagnosis and strategy for reference for those in the healthcare field.

Some literature has recommended the use of an organizational incident management strategy as a core element in patient safety initiatives (Helmerich, 1999; IoM, 1999; Leape, 2000; NHS, 2003), and Shaw & Coles (2001) have summarized established clinical reporting programs worldwide to demonstrate international effort towards patient safety. However, some notable arguments in organizational incident management strategy have been observed.

According to van der Schaaf (1991), uncovering the pattern of incidents is crucial for decision making about investing in safety improvement. However, such decisions can only be reached reliably by referring to statistics from large databases. As accidents themselves are too few in number to aid such a decision making process the use of

Near Misses to dramatically increase the amount of data in databases is one way to counteract this problem. Also, the significant report “To err is human” (IoM, 1999) and many other studies in the late 1990s have recommended focusing on Near Misses to identify latent problems.

Near Misses are defined as “An opportunity to improve safety practice based on a condition, or an incident with potential for more serious consequence” by Phimister et al. (2001), and they are important sources of information about accident precursors since they have a proven common causal relationship with adverse incidents (Van der Schaaf, 1991; Tamuz, 2004). Complex non-medical industries have developed incident reporting systems that focus on Near Misses, provide incentive for voluntary reporting, and ensure confidentiality (Barach and Small, 2000). However when it comes to implementation in the healthcare domain, a recent report “To Do No Harm” (Morath & Turnbull, 2005) described the situation as merely “fulfilling minimal obligations of mandatory reporting”.

While underreporting is common in the healthcare industry (Barach & Small, 2000), numerous researchers have attempted to investigate the contributing factors of the phenomenon. The impediments to reporting of adverse incidents and Near Misses were examined by Lawton & Parker (2002) and Bridges (2000). Based on their

studies, a study had been conducted to examine the reporting impediments faced by local healthcare practitioners.

In Hong Kong, a project between 10 private and public hospitals that aims to promote reporting and sharing of Near Misses was initiated in November 2004. The theme of the project implementation follows Reason's (1997) safety culture model: Building of reporting, learning, and a just culture. The research findings are summarized in this report, which covers the common high risk area in Hong Kong hospitals, the cultural aspects that favors Near Miss reporting and sharing, reporting impediments, and learning behavior among participating hospitals. Two survey studies were specifically designed to look into the above matters. Staff feedback has been obtained at project milestones to investigate the effectiveness of implementation. Since this project is the first of its kind in Hong Kong, the project can act as benchmark for similar projects in other high reliability organizations such as aircraft maintenance and power plants.

2 RESEARCH BACKGROUND

This Chapter introduces the background to the study on The Project K- Miss Share, and states the research objectives of the Project.

2.1 Project Background

This Project is funded under the "Professional Services Development Assistance Scheme" of the Government of the Hong Kong Special Administrative Region, with title "Knowledge Sharing and Management on Near Miss among 10 Private and Public Hospitals for Quality Healthcare Service". It was later named the "Project K – Miss Share" ("the Project" hereafter). Inspired by the significant researches on Near Misses reporting as a patient safety tools (IoM, 1999; NHS, 2003), the Project is a collaborative patient safety project in hospital services to promote reporting and sharing of Near Misses through structured channels and campaigns to collect good practices. The Project was initiated by Dr. Sammy Sou of Canossa Hospital (Caritas), and The Hong Kong Polytechnic University. The Project was commenced on 1st November 2004 and concluded on 30th October 2006.

Hospital is a complex and professional-intensive system. The system embraces a

series of inter-related services, which involves substantial amount of knowledge intensive tasks and frequent interaction among hospital staff. Because of the complexity of work, errors are inevitable. While job accuracy and patient safety are mainly governed by established rules and regulations, they are also affected by the values and culture of the public and individual hospital. Overall speaking, hospitals' safety culture is affected by the local environment, including government policies and peer performance. For the microscopic view inside each hospital, multi-professionals exist and they may have different senses of risk awareness and hence the importance of Near Miss reporting. The Project focuses on impacting the macroscopic environment by aligning 10 local hospitals, while at the same time facilitates learning among participating hospitals. How to get consensus among different hospitals and among multi-professionals are the biggest challenges of the project and this involves a lot of effort to bring about cultural change. Therefore support and, if appropriate, close collaboration from different hospitals and the government is highly beneficial to project implementation. Strategies and studies are specially designed to overcome psychological and practical barriers during the implementation of the project. On the technology side, the concern will be in the data mining methodology for collected data.

The patient safety journey in Hong Kong is relatively new when compared to the UK

and the US. In late 1990s, patient safety concepts in Hong Kong were roughly grouped under hospital quality assurance, and there was little voluntary participation in this domain. Quality managers did not even exist in most hospitals, or if they existed, they were usually “integrated” into the work domain of administration and customer service. Soon after a fatal renal accident in 1998 in one HK hospital, some quality “teams” seemed to arise, but they were mostly the kind of loosely held “teams” as described by Uhlig (2002). Risk management in hospitals were only formalized after bird flu and SARS in the early 2000’s, but they were not the kind of community of practice yet, since most members were nominated by hospitals. Some of them did not show voluntary participation, rather some just demonstrated the attitude to achieve the minimum requirement.

Inter-hospital communication on quality enhancement began when one HK hospital initiated a cross-hospital project on quality and benchmarking in 2001. Representatives from different hospitals voluntarily participated in the project by sharing their good practices, and this project team formed the initial prototype of a hospital quality community. After the benchmarking project these hospitals continued to work on something related to quality and patient safety together, including the Trent Accreditation scheme, Ying Zhen project, and the Project K – Miss Share. Members remained roughly the same in these projects which was implemented

across 5 years.

The public-private collaboration planning initiated by the HKSAR Government in recent years is another trigger for a series of hospital quality and patient safety projects. Communication between public and private hospitals has increased dramatically since the early 2000's. Initially these communications were mainly on diverting patients from public to private hospitals, but later on they focused more on practice and resources sharing. In the Project K – Miss Share some public hospitals and representatives from the Hospital Authority also joined. The 10 local hospitals that have joined the Project are listed in Table 2.1.

Table 2.1 List of participating Hospitals

Private Hospitals	**Public Hospitals**
Canossa Hospital (Caritas)	Caritas Medical Centre
Evangel Hospital	North District Hospital
Hong Kong Baptist Hospital	Tseung Kwan O Hospital
Precious Blood Hospital (Caritas)	
St. Paul's Hospital	
St. Teresa's Hospital	
Tsuen Wan Adventist Hospital	

The construction of the objectives of Project K – Miss Share is high dependent to the current risk management strategies in participating hospitals. Before the Project, the risk management strategies in all participating hospitals are fairly similar, which more or less follow the Hong Kong Hospital Authority's (HA) risk management

framework. In HA's corporate statement (HAHO, 2005), they state that their risk management strategy emphasizes a systematic approach to managing risk, top-level leadership commitment and a culture of safety embracing the whole organization. The key objective of the risk management strategy is to create a safety culture, which includes a reporting culture, a just culture and a learning and sharing culture. They are operationalized as listed below (HAHO, 2005):

(i) Construct and maintain an electronic incident reporting system, the Advanced Incident Reporting System (AIRS), for the collection of incidents from frontline staff to hospital management.

(ii) Promote an open and fair environment for reporting. The focus shall be placed on system and process improvement for prevention. Disclosure of information to patients is in accord with recent ethical advances in medicine, for openness.

(iii) Share experience and innovation in patient safety measures. Talks are organized frequently. The Hospital Authority intranet on risk management resources is updated regularly to ensure up-to-date information is posted and easy for all to access.

(iv) Provide train-the-trainer courses for nominated staff for disseminating learning

on incident reporting (AIRS), root cause analysis (RCA), risk assessment and risk reduction strategies for Risk Register (RR). The trained personnel will act as AIRS, RCA and RR facilitators at cluster/ hospital level.

(v) Formalized the risk assessment for the creation of Risk Registers, so that risks can be prioritized and reviewed.

(vi) Key risk areas which require development and necessary resources are linked to the annual planning process.

The above strategies are brought out because of their relevance and applicability in all participating hospitals. The objectives of Project K – Miss Share shall be set complementing with the current risk management strategies. In light of this, the following Project objectives are defined. The core strategy adopted by the Project and the Project governance model is described in Section 4.3.

(i) To establish a platform and mechanism for Near Miss reporting and knowledge sharing inside and among seven private hospitals and three public hospitals

(ii) To conduct a Survey on professional staff's concepts of, knowledge about and attitude towards Near Miss reporting

(iii) To conduct a generic Pilot Effectiveness Study on various methods for the promotion of Near Miss reporting

(iv) To promote ‘Near Miss + Mild Event’ reporting (culture change and actual practice) among hospital professional staff

To promote the awareness of risk management and patient safety in participating hospital

As an active participator of the Project and research student under the Teaching Company Scheme (TCA) between The Hong Kong Polytechnic University and the Canossa Hospital (Caritas), the author was responsible for the design of the reporting mechanism, the survey and the interviews, the data analysis and the implementation at the various hospitals of the whole project. While following the departure of the Project Coordinator, Dr. Sammy Sou, in August 2006, the author assume the major role in the coordination and execution of the Project, which further strengthened his understandings to the changes brought by the Project to different level of staff in participating hospitals.

2.2 Research Problem Definition

As mentioned in the Section 1 and Section 3.1.2, studies in different countries have revealed the seriousness of injuries and death caused by medical adverse incidents. In light of this, a number of researchers have advocated the use of organizational incident management strategy as a core element in patient safety initiatives (Leape, 1999; Helmerich, 1999; IoM, 1999; NHS, 2003). While schemes for reporting Near Miss have been institutionalized in aviation, nuclear power technology, petro-chemical processing, steel production, and military operations, such a scheme is apparently new in healthcare settings (Barach & Small, 2000). In other words, the Near Miss management practice in healthcare is borrowed from other industries and this study the first launch of inter-hospital Near Miss reporting in hospitals in Hong Kong

A generic incident management model included 7 steps: “Identification”, “Disclosure”, “Dissemination to Decision Makers”, “Identification of Root Cause”, “Solution Determination”, “Dissemination to Implementers”, and “Resolution” (Phimister, 2000). The model is further addressed in Section 3.2.1. The Section also address the practical difficulties in “Dissemination to Decision Makers” and “Identification of Root Cause” by reporting, and other debates in report collection

including whether reporting shall be made mandatory or voluntary, anonymous or nominal, and whether healthcare staff shall report near misses together with adverse incidents.

Since experiences from other industries should be applied with caution (Helmerich, 2001), this industrial-based project can provide an opportunity for a practical research to investigate the impact of the promotion of reporting and sharing of Near Miss in the Hong Kong healthcare industry. The overall objectives of the research are then defined as follows:

(i) To review different approaches and practice in incident management in High Reliability Organizations and other countries

(ii) To design the appropriate reporting methods for Near Miss for the participating hospitals in Hong Kong and collect the Near Miss data for sharing

(iii) To investigate the reporting behavior on Near Misses of the project participants and to analyze the underreporting phenomenon

(iv) To study the changes in staff awareness to safety by comparing the staff responses in different scenarios before and after the launch of the Project

(v) To compare the effectiveness of the implementation of Near Miss reporting in different hospitals and to make recommendations for further work

Moreover, although there are many researches focusing on the use of Near Miss, few researchers have attempted to link them to the researches in organizational learning theories. This Project treats Near Miss Management as a kind of organizational learning tactic, and has thus provided another perspective in the explanation of the various phenomenons observed.

A review of current strategies and research effort in relation to incident management in High Reliability Organizations (HROs) and organizational learning was carried out. Recommended strategies by healthcare stakeholders are summarized and incorporated into this report.

2.3 Structure of Thesis

This thesis begins with an introduction and overview of the project background of Project K – Miss Share, and also the research background. In Chapter 3, theories and practices on incident and Near Miss management, the causation of underreporting phenomenon, theories on organizational learning, and attributes on safety culture are reviewed. The strategies and activities adopted by the Project, and systems and

governance model used in the Project are summarized in Chapter 4. Chapter 5 covers the methodologies in assessing the culture in participating hospitals, which includes analysis of collected Near Miss reports, and survey studies and observations to assess the changes in staff reporting and learning behavior.

Chapter 6 presents 2 major findings from the Project, including the identification of hospital high-risk areas, and the changes of staff attitude and development of intra- and inter-hospital learning behavior. Subsequent discussions regarding the findings are discussed in Chapter 7, including discussion on good practices in hospital high risks areas, and the reflection of the changes of staff attitude. Chapter 8 concludes the content of this thesis and provides recommendations for further research.

3 LITERATURE REVIEW

In this Chapter, the literature related to the nature of organizational incidents, incident management models, the underreporting phenomenon, components of safety culture, and Near Miss knowledge sharing methodology, are reviewed.

3.1 The Nature of Organizational Incidents

In order to understand and prevent the occurrence of incidents, the first step in the learning process is to understand the nature of incident occurrence (Bridges, 2000). This Section provides reviews on incident causation, development, relationships between incidents, and the nature of incidents in healthcare.

3.1.1 Causation of Organizational Incidents

Mishaps appear in an infinite number of forms, and no organization, even with the best defense, is immune from these unfavorable events. James Reason (1997) has termed mishaps which happen in different organizations as “organization incidents” and provides a definition for this as:

"Breaching of the barriers and safeguards (Organizational defense) that separate damaging and injurious hazards from vulnerable people or assets"

From the definition, organizational incidents occur when there is a breaching of organizational defense. In any give system, defense is breached when there is an error committed. Therefore when an organizational incident is diagnosed, one can always find an error within – either an uncontrollable error or a controllable error.

Since uncontrollable errors cannot be eliminated, Reason (1997) specially drills into controllable error and classifies them into 4 categories as stated in Figure 3.1. Controllable error is defined as the failure of planned actions to achieve their desired ends – without the intervention of some unforeseeable event. There are 3 elements to this definition: a plan or intention that incorporates both the goal and the means to achieve it, a sequence of actions initiated by that plan, and the extent to which these actions are successful in achieving their purpose. Logically, actions may fail to achieve their goal for one of the following reasons:

(i) The plan is adequate, but the action fails to go as planned. These are unintended failures of execution and are commonly termed slips or lapses.

(ii) The action may conform exactly to the plan, but the plan is inadequate to

achieve its intended goal. Here the failure lies at a higher level – with the mental processes involved in assessing the available information, planning, formulating intentions, and judging the likely consequences of the planned actions. These errors are termed mistakes, and have been further divided into rule based; or knowledge based mistakes. Rule based mistakes involve the misapplication of normally good rules, the application of bad rules, or the failure to apply a good rule. Knowledge based mistakes frequently occur when one has to think out problem solutions on line. Therefore knowledge based mistakes are sometimes called misjudgments.

One point Reason (1997) does not mention in the definition of organizational incident is the outcome of the incident. However, Heinrich (1941) as a pioneer researcher in industrial safety did differentiate different organizational incidents according to the severity of their outcome. This will be discussed later in this Section.

No matter which type of error is committed, an incident is waiting to happen. Concerning how a given error develops into an incident, Reason's Swiss Cheese Model (Figure 3.2) explains the propagation in terms of an error chain effect.

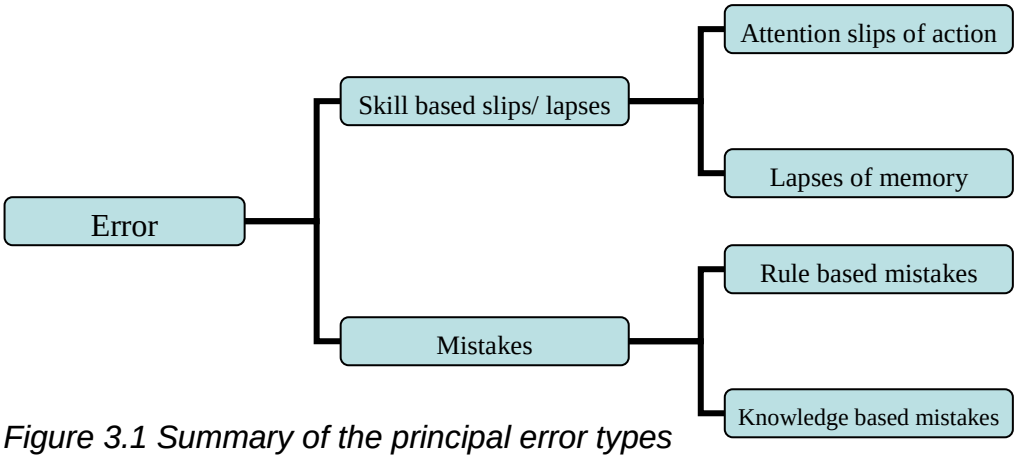


Figure 3.1 Summary of the principal error types

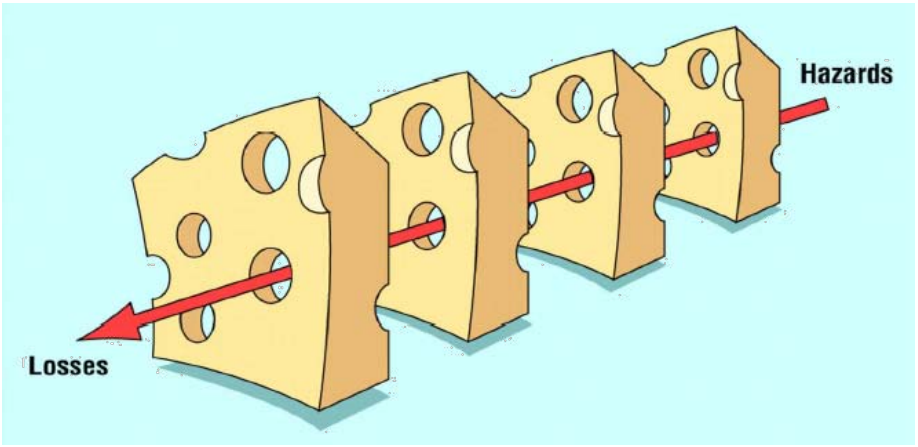


Figure 3.2 Swiss Cheese Model

In an ideal world all organizational defenses would be intact, allowing no penetration by possible accident trajectories. In the real world, however, each defense (represented by the cheese in Figure 3.2) has weaknesses and gaps. For example, one piece of cheese may represent machinery, and a hole on this cheese may represent inadequate maintenance. These weaknesses and gaps are actually vulnerabilities that are potentials to controllable errors.

The Swiss Cheese Model (Reason, 1997) demonstrates the development of an incident. The model also illustrates that incidents of different severity may have the same causal pattern. Events that pass through more “cheese holes” tend to pose more major threats, but they are usually fewer in number. The pioneer study by Heinrich (1941) in industrial incidents revealed a pattern that for every 300 Near Misses, there were 30 adverse incidents and 1 death. The pattern fits the assumptions in the Swiss Cheese Model. Bird and Germain (1996) elaborate on the above research. They say that 1,753,498 incidents were reported by 297 companies, for which they propose a ratio model that for every 600 Near Misses, there will be 30 property damage incidents, 10 minor injuries, and 1 major injury. The ratio reinforces the observation that there is a progressive decrease in incidents when severity increases. The observation was drawn in Figure 3.3.

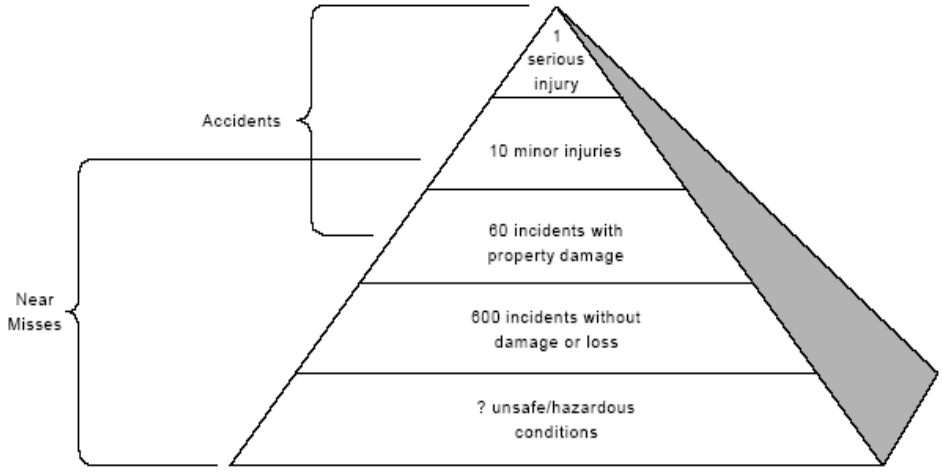


Figure 3.3 Incident Hierarchy

Incidents at the pyramid pinnacle may result in injury and loss, environmental impact and significant disruption and downtime of production processes. These incidents are often obvious, are brought to the attention of management, and are reviewed according to site protocols. Near misses comprise the lower portion of the pyramid. These incidents have potential to, but do not result in loss. A more formal definition on adverse Organizational Incidents is given below:

Adverse Incidents

Undesirable and unintended incidents that result in adverse outcomes

(Reason, 1997)

Near Miss

An opportunity to improve safety practice based on a condition, or an incident with potential for more serious consequence

(Phimister et al., 2001)

The major effort in healthcare and many other industries is to probe into the causes of different levels of incidents, improve the situation and thus prevent the happening of adverse incident.

3.1.2 Organizational Incident in Healthcare

Empirical research in healthcare adverse incidents provides the foundation for

estimating the need for a quality enhancement movement in the healthcare industry. Shaw and Coles (2001) summarize some remarkable research findings in the US, Australia and UK.

The Harvard Medical Practice Study (HMPS) is the benchmark for estimating the extent of medical injuries occurring in hospitals the USA. Brennan et al (1984) reviewed the medical charts of 30,121 patients admitted to 51 acute care hospitals in New York State in 1984. They reported that adverse events (injuries caused by medical management that prolonged admission or produced disability at the time of discharge) occurred in 3.7% of admissions. A subsequent analysis of the same data found that 69% of injuries were caused by errors. The Institute of Medicine (IoM) estimated in 1999 that between 44,000 and 98,000 people die each year in the US as a result of medical errors at a cost of between $17 and $29 billion to society (of which $8.8 billion is direct health care costs). Between 2.9 and 3.7 per cent of hospitalizations involve an adverse event.

In a study of the quality of Australian health care, a population based study modeled on HMPS, investigators reviewed the medical records of 14,179 admissions to 28 hospitals in New South Wales and South Australia in 1995. An adverse event occurred in 16.6% of admissions, among which 13.7% of patients resulted in

permanent disability and 4.9% resulted in death; 51% of these adverse events are considered to have been preventable.

A review of 1,014 medical and nursing records in two acute hospitals in the Greater London area showed that 110 (10.8%) patients experienced an adverse event, with an overall rate of adverse events of 11.7% when multiple adverse events were included. About half of these events were judged preventable with ordinary standards of care. A third of these adverse events led to moderate or greater disability or death. These results suggest that adverse events are a serious source of harm to patients and a large drain on National Healthcare System resources. Some are major events; others are frequent, minor events that go unnoticed in routine clinical care but together have massive economic consequences.

Looking more specific to the type of adverse incident and Near Misses occurred in the hospitals, one may refer to the quarterly report "National Reporting and Learning System Data Summary" provided in the website of UK National Patient Safety Agency: www.npsa.nhs.uk. As in issue 5 of the quoted report (NPSA, 2007), it is observed that "Patient Accident" is the leading major risk class (265343 out of the 727736 reports collected in the previous 1 year), which include the most significant single incident type "Patient fall". The second major risk class is "Treatment,

Procedure", which counts to 64227 out of 727736 reports. The third major risk class is "medication", which counts to 62660 reports. Since the taxonomy used for classification varies across the world, some of these data cannot be compared directly with other countries. However it is expressed by local hospital executives in the Project that the risk distribution portrait in Hong Kong is similar to that in the UK.

3.2 Organizational Incident Management: Model and Practice

While the nature of errors and incidents has been discussed, this Section aims to provide an understanding on the current effort organizations are making to tackle organizational incidents. Successful programs are reviewed, with special emphasis on the NASA's Aviation Safety Reporting System (ASRS).

3.2.1 Generic Incident Management Model

In the report of Phimister et al. (1999), a generic incident management model is given as shown in Table 3.1. The model contains 7 steps which forms an incident management loop. Although incident management has been a common tool in different industries for several decades, few practices can actually encapsulate and utilize all the steps in the model. In practice, there are already a number of concerns in the "Distribution to Decision Maker" step.

Table 3.1 Phimister et al.'s 7 Step Incident Management Model

Identification:	Staff who encounter an unintended organizational process or outcome shall have the responsibility to identify the event as an incident or Near Miss.
Disclosure:	Staff shall be encouraged to disclose any incident or Near Miss they encounter, upon identification as such.
Distribution to Decision Maker:	Incident or Near Miss information shall be transferred from the discloser to the person who will make decisions as to what preventive actions are necessary
Direct and Root-Cause Analysis:	In the analysis of an incident it is necessary to assess the direct and underlying root causes that caused the incident.
Solution Identification:	Decision makers shall determine corrective actions or solutions to rectify the root cause such that recurrence is much less likely
Dissemination to Implementer:	Suggestions for corrective action shall be sent to stakeholders with special emphasis on those gaining direct benefit. Vehicles to support information dissemination shall also be available
Resolution:	Follow up on solution implementation and evaluating feedback shall be performed after a certain time to ensure that appropriate actions have been fulfilled

Management shall specify whether reporting, which is referred to as ""Distribution to Decision Maker", shall be made mandatory or voluntary, anonymous or nominal, and whether healthcare staff shall report near misses together with adverse incidents. Mandatory reporting yields higher number of reports but increases the workload of staff, while voluntary reporting apparently yields fewer reports without adding undesirable burden to staff. Anonymous reporting may encourage truth-telling, but the event become difficult to trace when compared to nominal reporting. Separated near miss and adverse incident reporting can lower the complexity of near miss

reporting because less data is collected, but two separated report system may also induce staff confusion. Phimister et al. (2000) have conducted a study in 5 Fortune 500 companies and conclude that "Distribution to Decision Maker" and "Dissemination to Implementer" are relatively ineffective in the studied companies. Regarding distribution processes, Morath & Turnbull (2005) argue that there have been similar phenomena in healthcare and suggest that the purpose of a blameless voluntary reporting (distribution) system is to help people learn. It has the following goals:

(i) Designing fail-safe care delivery processes that deflect system errors and system vulnerabilities before they reach a patient to create harm

(ii) Facilitating more informed decision making for patients, providers, and clinicians

(iii) Feeding information back to the system to improve system design

(iv) Gathering information about the system that can be used for educating staff

When differentiating the effectiveness of the above 7 steps in incident management and Near Miss management, Phimister et al. (1999) also developed an equation and estimate that the potential value of Near Miss has been much overlooked. The

reasons for such phenomenon are discussed in Section 3.3.

3.2.2 Incident Management in Non-Medical and Medical Industries

Schemes for Organizational Incident management have been institutionalized in aviation, nuclear power technology, petrochemical processing, steel production, military operations, and air transportation (IoM, 2000; Barach & Small, 2000). The features of 11 non-medical incidents and Near Miss management systems (as list in Table 3.2) have also been summarized by Barach & Small (2000).

Seven of the 11 systems are implemented by the US federal government. Nine systems were confidential, another two were anonymous. All stimulate elaboration by narrative. The aviation safety reporting system has saved all of its 500 000 reports in their entirety. Most of the reporting programs offer feedback to their respective communities. Some offer legal immunity to reporters as long as data are submitted promptly (up to 10 days after the event for the aviation safety reporting system).

When looking specifically at the Aviation Safety Reporting System (ASRS), one can observe a similar framework to Phimister et al.'s (2000) model. The model of ASRS by Billings (1998) is demonstrated in Figure 3.4.

Table 3.2 Eleven Non-medical Organizational Incident Management System

Aviation	Aviation safety reporting system (ASRS) Aviation safety airways program (ASAP) Air Altitude Awareness Program Canadian aviation safety reporting system (CASRS) British Airways safety information system (BASIS) Human factors failure analysis classification system (HFACS)
NASA	Safety reporting system
Petrochemical processing, steel production	Prevention and recovery information system for monitoring and analysis (PRISMA)
Nuclear (nuclear power and radiopharmaceutical industries)	Licensing event reports (LER) Nuclear Regulatory Commission allegations systems process (NRCAS) Diagnostic misadministration reports—regulatory information distribution system (RIDS)

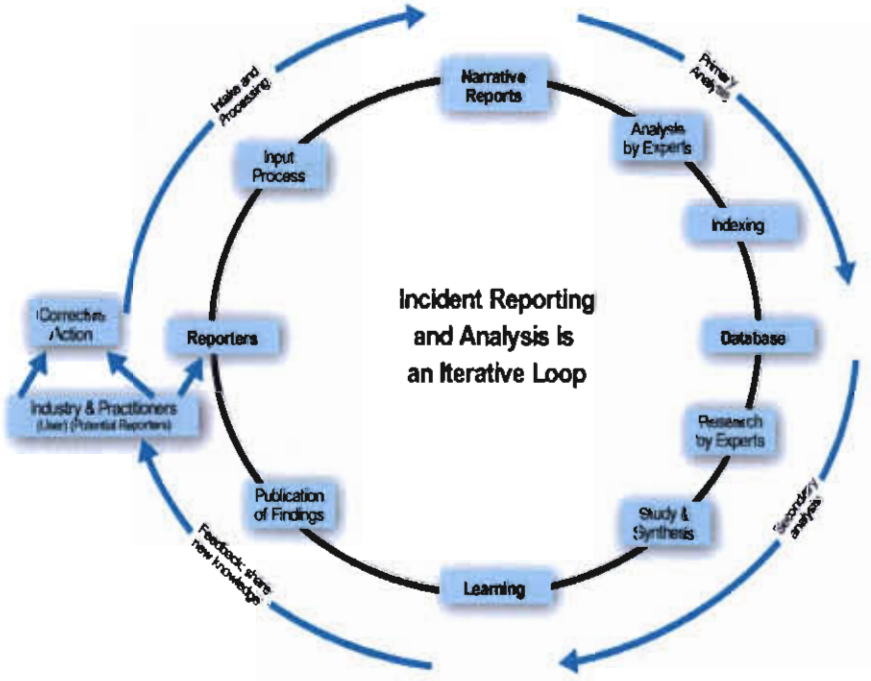


Figure 3.4 Aviation Safety Management System Loop

The purpose of the ASRS is to collect, protect, and use incident data to improve the

national aviation system. Information from the ASRS supports aviation system policy, planning, and improvement, and strengthens the foundation of human factors research in aviation by identifying deficiencies to be corrected by appropriate authorities. The reports are analyzed by panels of expert readers (often retired pilots) to extract alerts, lessons learned, and trends and themes.

Health care has lagged behind other industries in implementing reporting systems and other initiatives related to safety (Barach and Small, 2000). Shaw and Cole (2001) conducted an extensive research in an international effort to tackle Organizational Incidents and observed that although there are many systems in place, few can operate as effectively as other High Reliability Organizations (HROs). Some systems that are of special public attention and wide influence are demonstrated below.

(i) Australian Incident Monitoring System (AIMS)

Introduced in 1996, AIMS has provided a mechanism for any incident or accident (actual or potential) in healthcare to be reported, using a single standard form. Incidents are then classified on corresponding software, using two unique classification systems developed by the Australian Patient Safety Foundation (APSF).

(ii) Sweden: National register of medical incidents

Every health care provider in Sweden is obliged to report all adverse events (where a patient has been injured) or risk of them to the National Board of Health and Welfare (SoS). Reports are registered and classified in a national database and anonymous information bulletins are regularly circulated to all providers. But reporting levels are low, apparently largely because personnel involved are likely to be reported to the Medical Disciplinary Board (HSAN).

(iii) Switzerland: Anesthesia-related mortality and incidents

The Department of Anesthesia at the University of Basle, Switzerland set up an anonymous critical incident reporting system (CIRS) for anesthetists in 1996 based on standard Internet technology and mounted on the local network. It is protected from the Internet with a firewall that satisfies the strong legal requirements of the national data-security act but it can be reached from every networked computer in the hospital.

(iv) Medication Error Reporting program (MER)

This voluntary system for “frontline practitioners” (using telephone, mail, or Internet) was originated by the Institute for Safe Medication Practice in 1975 and is now

administered by US Pharmacopoeia. Information is shared with the FDA and any manufacturers concerned. About 3000 reports have been received since 1993.

(v) MedMARx

A voluntary medication error reporting program, for subscriber hospitals only, started in 1998; it is administered by US Pharmacopoeia (USP) and guided by the National Coordinating Council for Medication Error Reporting and Prevention. It is voluntary, Internet-based and anonymous, so staff can complete a standardized report, and managers can retrieve reports from their own and other participating hospitals.

(vi) Advanced Incident Reporting System (AIRS)

In the local Hong Kong healthcare industry, the Advanced Incident Reporting System (AIRS) plays a crucial role in incident collection in the public sector hospital services. The system aims to provide users with a web-based system for reporting incidents to cluster/hospital management, analyzing the incidents types and generating the management reports/enquiry via an extensive array of comprehensive searching and analysis facilities. It is thus a critical component in the Hong Kong Hospital Authority's risk management strategy.

3.3 The Underreporting Phenomenon in Hospital Systems

With systems in place, many Organizational Incident management efforts still fail. For example, in the US healthcare system, underreporting of adverse events is estimated to range from 50%–96% annually (Barach & Small, 2000). Many researchers attempt to provide explanation to such phenomenon, and this Section is a review on the respective theories.

3.3.1 Human Behavioral Model

In order to understand the underreporting phenomenon, it is critical to be aware of the blame cycle proposed by Reason (1997) and the First-order and Second-order Problem Solving Model by Tucker and Edmundson (2003).

The blame cycle proposed by Reason (1997) is shown in Figure 3.5. It basically illustrates a typical behavior on how managers view the errors made by their subordinates. When an error is committed, it usually involves several superficial and root causes. Among those causes, human actions are usually viewed as the most avoidable and thus easy to attract blame. However when involved personnel(s) is/are being blamed, managers usually ignore the underlying causes of error and leaving it as a trap. Since the trap is not removed, people may commit the error again easily,

making their error seems more blame-worthy.

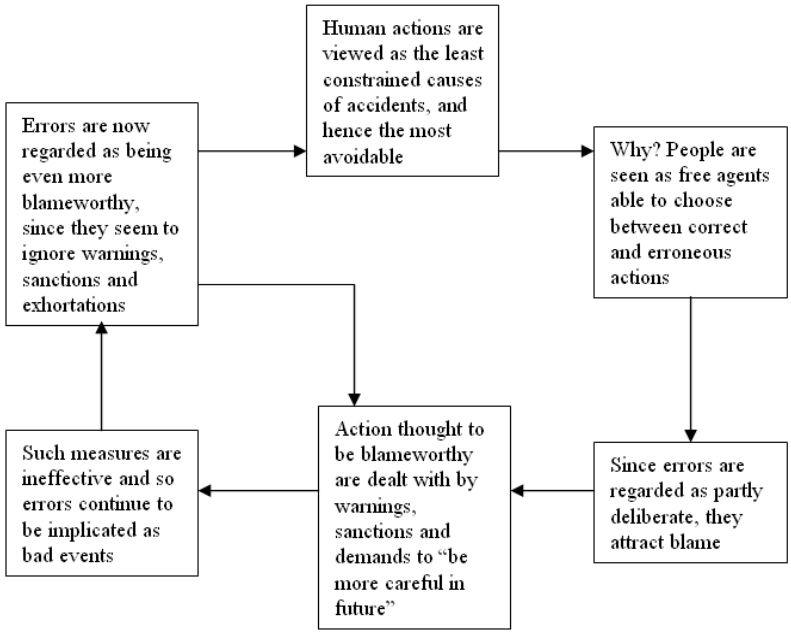


Figure 3.5 The Blame Cycle

Tucker and Edmundson's (2003) observe a framework similar to Reason's (1997) blame cycle in the hospital environment. The problem-solving loop by Tucker and Edmundson (2003) is stated in Figure 3.6. There are 2 problem-solving loops: the first-order problem solving loop and the second-order problem-solving loop. When a problem arises, a worker needs to engage in first-order problem solving merely to be able to continue his or her duties. This means that although the behavior appears to provide a solution, the solution, in fact, is a temporary measure. At this point, the temporary solution is likely referred to as warnings, sanctions and demands to be "more careful" as mentioned in the blame cycle. First-order problem solving and the

blame cycle, however, does not alter the underlying conditions that gave rise to barriers to task completion, and so the failure, or another mistake just like the first, is likely to recur.

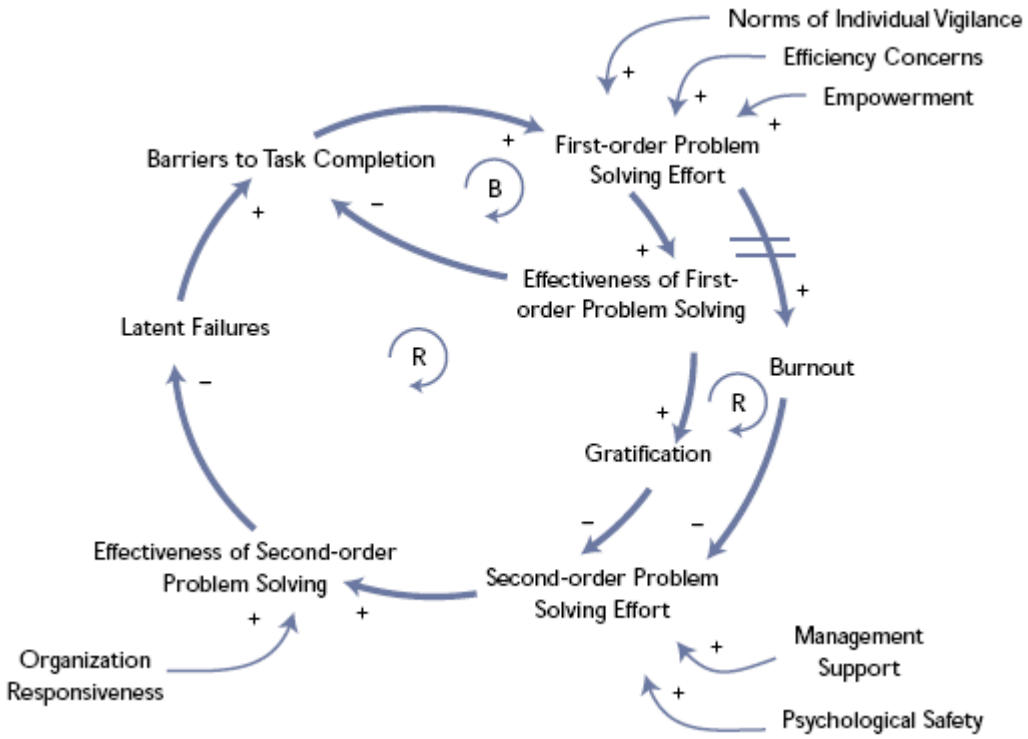


Figure 3.6 First-order and Second-order Problem Solving Model

However, Tucker and Edmundson (2003) also suggest that an increase in first-order problem solving actually reduces the likelihood that underlying causes will be addressed. The more effort expended in first order problem solving, the less likely he or she is to have and to take the time to engage in second-order problem-solving behavior. Because first-order problem solving takes time, it can leave workers with less flexibility to investigate causes and negotiate potential counter-measures.

Further, to those directly involved, things seem to be working reasonably well. Because first-order problem solving is time-consuming and tiring, burnout begins to take its toll on the system. This time delay is represented in Figure 3.6 by two slash marks between first-order problem-solving effort and burnout. This symbol indicates that first-order problem-solving behavior leads to burnout. Frustration and exhaustion accumulate over time. Not surprisingly, worker burnout then further decreases the chances of effortful engagement in second-order problem solving.

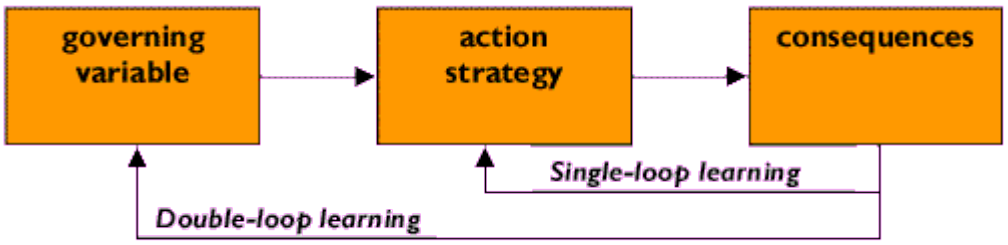


Figure 3.7 Single-loop and Double-loop Learning

The blame cycle and first-order problem solving loop can said to be a single-loop learning behavior in Argyris and Schon (1977)'s theory. They define organizational learning as "learning from error" which comprises single-loop and double-loop modes of change. Single-loop learning occurs when an organization encounters a situation that it can resolve using its current policies and procedures. Double-loop learning requires a revision of organizational values and assumptions. In single loop learning, no change in the system is induced after the problem has been resolved.

Figure 3.7 illustrates the differences between single and double loop learning.

Since Model I behavior (Argyris and Schon, 1978) is said to be a inhibiting behavior for double-loop learning, the reasons leading to the first-order rather than second-order problem solving behavior observed by Tucker and Edmundson (2003) may be attributed to the Model I behavior. Model I behavior includes a set of governing values, primary and operationalized strategies, and consequences. They are:

The Governing Values of Model I are:

Achieve the purpose as the actor defines it

Win, do not lose

Suppress negative feelings

Emphasize rationality

Primary Strategies are:

Control environment and task unilaterally

Protect self and others unilaterally

Usually Operationalized by:

Unillustrated attributions and evaluations e.g.. "You seem unmotivated"

Advocating courses of action which discourage inquiry e.g.. "Lets not talk about the past, that's over."

Treating ones' own views as obviously correct

Making covert attributions and evaluations

Face-saving moves such as leaving potentially embarrassing facts unstated

Consequences include:

Defensive relationships

Low freedom of choice

Reduced production of valid information

Little public testing of ideas

Argyris (1985) has claimed that nearly all the participants in his studies operated from theories-in-use of Model I. This phenomenon suggests that people tend to solve problems in a simpler manner which involves as little change as possible. However, this would in long term lead to burnout and failure. This phenomenon can also be explained by the organizational defense routine suggested by Argyris (1990). An organizational defense routine is any policy or action that inhibits individuals, groups and organizations from experiencing embarrassment or threat and, at the same time, prevents them from identifying and reducing the causes of the embarrassment or threat. These routines are anti-learning and overprotective since embarrassment and threat of exposing one's thinking outweigh the intention to learn and change. The root of the problem often becomes undiscussable, and even worse, its undiscussibility is also undiscussable. Often, the very attempt to bypass the issues reinforces and proliferates the defensive routines.

Apart from these behavioral models, some researchers add a list of psychological and

organizational impediments that further inhibit staff intention to communicate error and they are addressed in the following Section.

3.3.2 Psychological and Organizational Impediments

Bridges (2000) has carried out an extensive survey to seek common reporting impediments in different industries. Twelve companies from chemical industry, polymer industry, refineries, drug/pharmaceutical companies, pulp and paper mills, petrochemical companies, and oil exploration/production responded to the survey involving around 56000 employees. Barach and Small (2000) also summarizes the impediments from research in non-medical industries. Some of which is listed in Table 3.3.

And specific to Near Miss, Bridges (2000) identifies 2 more impediments by management which are:

(i) Believing that a relatively low return on investment is obtained from investigating Near Misses as opposed to investigating actual incidents

(ii) Lack of understanding of the difference between a Near Miss and a non-incident

Table 3.3 Impediments on reporting and learning

	Individual	Organizational
Legal	Fear of reprisals, lack of trust	Fear of litigation, sanctions undermine trust, bad publicity
Cultural (values, attitudes, beliefs)	Professional authority, code of silence, fear of colleagues in trouble, skepticism, extra work	Bureaucracy, zero error tolerance
Regulatory	Exposure to malpractice, premiums will go up, investigation and potential censure, license suspension	Protectionism (do their own internal analysis), assume others can't understand their problems
Financial	Loss of reputation, loss of job	Wasted resources, potential loss of revenue & patient care contracts, not cost effective

As observed from the above impediments, it is of no surprise that the underreporting phenomenon is so serious. Excessive works for reporting may even induce negative effect to individuals and organizations, while in most organizations there are no or little incentive schemes to outweigh the negative thoughts. Moreover, a number of studies suggest that healthcare professionals, particularly doctors, are reluctant to report adverse events to a superior (Helmerich, 2000; Barach & Small, 2000; Lawton & Parker, 2002; Tucker & Edmundson 2003). This can be explained by the individual vigilance of healthcare professionals (Tucker & Edmundson, 2003). It is an industry norm that encourages healthcare professionals to take personal responsibility to solve problems as they arise. Counter intuitively, this can create barriers to organizational improvement because, in addition to encouraging individuals to be alert to things that can go wrong and to quickly take action, norms

of individual vigilance encourage independence. Each caregiver thus tends to work on completing her or his own tasks without altering common underlying processes.

3.4 Near Miss Management: From an Organizational Learning Perspective

Organizational learning is often quoted in organizational behavioral theories, as it covers a rather fuzzy but critical component for the continuous survival of organization. Organizational learning theories can thus be applied to a wide range of organizational activities, which includes Near Miss Management. The following part gives a review of various organizational learning theories and their application in Near Miss Management.

3.4.1 Basis of Organizational Learning

Organizational learning is a subtle concept, as it touches upon a variety of disciplines and topics from sociology, psychology, organizational development, management science, anthropology, epistemology, education theory etc. Because of this, numerous definitions have been given by a number of researchers which give the term quite different meanings. Some of these are summarized in Table 3.4.

In a narrow sense, it is observed that the merit of Near Miss Management fits with the definition of organizational learning given by Argyris (1978) in the sense that they both focus continuously on detecting and correcting errors. In the broad sense, Near Miss Management can help to create new knowledge and require modifying organizational behavior to reflect new insights. Therefore it is sensible to relate Near Miss Management to organizational learning theory, and to some extent apply organizational learning theory to assist Near Miss Management and explain the behavior that arises during implementation of the system.

At the basic level, the main purpose of organizational learning is to detect and correct errors and misfits within the existing governing principles, values, and policies of an organization. Examples of such learning include product inspection and staff appraisal. Learning of this type is termed exploitative organizational learning (Lee, 2005). This type of organizational learning makes use of available collective knowledge for continuous improvement. The aim of this kind of learning is to restore the existing standard of the operating system to fits policies and guideline. Since no rethinking in governing value is observed, exploitative organizational learning may also be seen as single loop learning (Argyris, 1977) in the organizational context.

Table 3.4 Definition of Organizational Learning by different scholars

Authors	**Year**	**Definitions**
Cyert & March	1963	The adaptation of organizational goals, attention rules and search rules as a function of staff experience
Argyris C.	1977	Organizational learning is a process of detecting and correcting error
Argyris et. al	1978	The ability to detect and correct error, the mismatch of outcome to expectation
Fiol & Lyles	1985	Organizational learning means the process of improving actions through better knowledge and understanding. The process by which organizations change a focal learning content, via behaviors, cognitions, or both
De Geus	1988	The process whereby management teams change their shared mental models of their company, their markets and their competitors
Levitt & March	1988	The encoding of inferences from history into routines that guide behavior
Senge P.	1990	The continual expansion of the organization's capacity to create its future
Huber	1991	The acquisition of knowledge that they recognize as potentially useful by any of its units
Huysman	2000	Organizational learning is the process through which an organization constructs knowledge or reconstructs existing knowledge

There is a second type of organizational learning which can be called exploratory or reflective organizational learning (Lee, 2005). It shifts from the mastery of discrete and external pieces of knowledge to the collective exploration of new values or governing principles. In addition, this higher form of organizational learning is said to be reflective, as learning is intrinsic. Such kind of organizational learning can fully illustrate the merits of double loop learning (Argyris, 1977) in organizations.

The knowledge domain that supports the exploratory type of organizational learning is different from the domain that supports the exploitive type. Whereas techniques and tools for the exploitive type of organizational learning are well developed under good practices in the management field (e.g. total quality management, continuous improvement, balanced score card, etc.), those that support a reflective mode of organizational learning are relatively less known and less practiced in organizations (e.g. actions science, group and systems dynamics, storytelling, dialogue etc). However, it is in the latter where most of the important work in organizational learning has been based, as exemplified by the Theory of Action of Argyris and Schon (1978), and the Fifth Disciplines of Peter Senge (1990). The common themes of these two influential works illustrate that the core issue of the reflective type of organizational learning is to understand how organizations learn (Lee, 2005).

Organizational learning theories also address the organizational defensive routine discussed in Section 3.3. Defensive behavior usually protects members against the anxieties of uncertainty and unpredictability. According to Schein (1996), two kinds of anxieties will emerge when the status quo is challenged in double-loop learning, namely, change anxiety and survival anxiety. Survival anxiety refers to the realization that one must change to survive. When the fear of not changing (survival anxiety) is greater than the fear of entering the unknown and unpredictable (change anxiety),

learning will be facilitated. The same theory applies to Near Miss Management since staff would have a kind of change anxiety in reporting Near Miss, while at the same time realize the survival anxiety of maintaining or covering up current risk. To facilitate learning, the organizational culture should be one that reduces the change anxiety by providing:

(i) A psychologically safe place for people to learn

(ii) A practice field that gives members a chance to make mistakes and learn from errors

(iii) Guidance and coaching

(iv) Feedback to learning

(v) Chances to take experiments

Bearing in mind several organizational learning behaviors, Senge (1990) gives perhaps the most influential facilitation theory to organizational learning. His theory suggests that organizational learning starts from individuals when they have several important disciplines, namely Systems Thinking, Personal Mastery, Mental Models, Building Shared Vision, and Team Learning. According to Senge (1990), all the disciplines are “concerned with a shift of mind from seeing parts to seeing wholes, from seeing people as helpless reactors to seeing them as active participants in shaping their reality, from reacting to the present to creating the future”.

Although Senge emphasizes that there is no organizational learning without intrinsic individual learning, Argyris (2000) is of the opinion that an organization can become a learning organization more effectively if change begins at the top. Despite the fact that the 2 viewpoints differ from the starting point of organizational learning, both admit that the ultimate goal is to create double loop learning in every cell of an organization.

3.4.2 Learning Among Organizations

Noting the nature of organizational learning discussed in Section 3.4.1, one may wish to ask further how learning looks like when it occurs across organizational boundaries. Since participating hospitals do exhibit some degree of learning among themselves, some issues on inter-organizational learning is discussed in this Section.

According to Fang & Wei (2005), inter-organizational learning can be viewed as the collective acquisition of knowledge among a set of organizations, and it can be further specified as distinct from organizational learning by including the learning synergy or interaction effect between the organizations that would not have occurred if there had not been any interaction (Larsson et al. 1998). Because inter-organizational learning theories are generated from studies of strategic alliance interaction, such theories usually focus on the relationship between partner

organizations and the process to manage inter-organizational learning.

However, in shaping collaborative arrangements between organizations, managers need to consider the risks that their organizations face by engaging in knowledge sharing. Janowicz (2004) summarizes the possible concerns of managers when considering such arrangement. First, there is the risk of expropriation, if the partner uses the rightfully obtained knowledge opportunistically in ways contrary to the letter or spirit of the alliance contract. Barney (1991) has pointed out that tacit knowledge is considered to be the primary source of an organization's competitive advantage. Sharing of such knowledge, therefore, is marked by the risk of the competitive advantage being dissipated or the knowledge being used by the partner to the focal organization's detriment. Second, an organization runs the risk of knowledge leakage, where the partner, intentionally or unintentionally, acquires knowledge the sharing of which was not intended. Even if the alliance partner is not a potential competitor (i.e., the linkage is of vertical rather than horizontal nature), the risk of spillover may still be high, if such competitors are part of the partner's network. In such cases, core competence can leak to a competitor indirectly via the alliance partner (Nooteboom, 1999). Given these risks, trust between partners emerges as an important factor affecting their mutual knowledge transfers.

It is suggested that a high level of trust has a positive effect on knowledge sharing (McEvilly, Perrone, & Zaheer, 2003) in both the intra-organizational (e.g., Kostova, 1999; Makino & Inkpen, 2003; Tsai & Ghoshal, 1998) and in inter-organizational contexts (Geringer, 1988; Dyer & Chu, 2003; Inkpen, 1997; Hedlund, 1994). However, according to Janowicz (2004), most studies take the effect of inter-organizational trust on learning for granted or handle it marginally. In particular, little attention is paid to the meaning of trust as an inter-organizational phenomenon.

When considering trust in the inter-organizational learning context one has to be aware of the distinction between organizational actors who frame the strategic intentions of the organizations in a cooperative agreement and those who actually implement the agreement at the operational level (Janowicz, 2004). This consideration is rarely reflected in research on learning in inter-organizational alliances (Salk & Simonin, 2003). Janowicz (2004) further adds that trust between executive decision-makers of the collaborating organizations, i.e., strategic-level trust, is likely to be different in its sources and consequences from trust between operational-level boundary spanners, i.e., operational-level trust. Consequently, trust at these two levels can be expected to be related to inter-organizational learning, differently.

Actors in inter-organizational learning are made up from different organizations. These actors, however, play different roles in their own organizations and thus have unequal power to impact organization's behavior in the collaborative context. Every position in an organizational hierarchy is associated with a certain role, which reflects the expectation with respect to the position holder's contribution to operational and strategic tasks (Floyd & Lane, 2000). Organizational roles thus restrict and guide individuals' conduct in an organizational (Nooteboom et al., 1997). Although at the operational level the knowledge transfer agents have some degree of control to sharing content, prior arrangement must be done by top executives therefore they have absolute control in inter-organizational learning arrangement. Thus in the early phase of an inter-organizational learning arrangement, strategic level trust is more important than operational level trust. While for continuous operation and elaboration on mutual learning, both strategic level and operational level trust should be nurtured for example in the context of inter-organizational Communities of Practice.

Communities of practice are groups of people who share information, insight, experience, and tools about an area of common interest (Wenger, 1998). They are part of the socially-constructed structure of organizations and are frequently formed around topics that community members come across, including everyday problems

and developments in the field. People participate because the community provides value. According to McDermontt (2001), because community members share a common technical interest, they can share ideas and concerns with others who really understand. Praise from community members is often the most meaningful because technical peers really understand the difficulty of the work or the brilliance of an analysis. As a result, people often have a great deal of their professional identity tied up in their communities and they can spread the insight from that collaborative thinking across the whole organization.

Sharing inside such communities of practice involves sharing of both organizational tacit and explicit knowledge. According to Janowicz (2004), the higher the tacitness of knowledge, the more individuals must be its transfer agents (Inkpen & Dinur, 1998; Hedlund, 1994). Successful transfer of tacit knowledge between alliance partners requires wide-ranging, continuous, face-to-face interactions between individual members of the learning alliance partners (Inkpen & Dinur, 1998; Lane & Lubatkin, 1998; Kale et al., 2000).

3.4.3 Sharing of Near Miss Knowledge among Hospitals

Different organizations have different intentions to form an inter-organizational learning relationship and hence the sharing context. Generally speaking, the benefit

of inter-organizational learning is well understood. Partners can access each other's knowledge-based and organizationally-embedded tacit resources (Hall, 1992; Inkpen, 1997). When it is known that it is too costly to afford quality programs that large organizations have made, smaller organizations can pool resources to access expertise, learn from each other's experiences, develop common materials, assess the merit of different practices, and build a common baseline of knowledge by learning collaboratively. The Northeast Indiana TQM Network is a good example that small to medium enterprises join together and learn collaboratively about Total Quality Management methodology (Wenger, McDermott and Snyder, 2002).

Inter-organizational learning about organizational incidents usually begins with critical incidents or crises. Crises are extreme examples of the serious societal problems that cut across traditional public boundaries and require a network response (Koppenjan and Klijn, 2004). Review of the relevant literature by Stern (1997) found that crises can create opportunities for learning. Sometimes crises can have a catalytic effect, focusing political attention, widening the interest of involved publics, accelerating change processes and breaking down resistance to change. Comfort (1994) examines the inter-organizational disaster response system that evolved in the dynamic environment following the Northridge, California Earthquake of January 17, 1994. Through a combination of planning, preparedness, interactive communication,

shared commitment and chance, an inter-organizational, inter-jurisdictional disaster response system evolved very rapidly following the Northridge Earthquake in California, the US. Another example is the 9/11 incident, which triggered the US federal government to rethink their Incident Command System and facilitated learning between emergency response departments.

Specific to the healthcare industry, the social drive to achieve safety also acts as a critical motivation to the sharing of quality, risk and safety related knowledge among hospitals. Implementing reforms to prevent harm to patients and to promote learning from adverse events will involve numerous initiatives ranging across the boundaries of multiple policy systems and organizations (Thomas, 2006). Coordination can be based upon interaction, communication, information sharing and joint decision-making in which different parts of the health care system learn from one another and take the actions of others into account in their own decisions and activities. The creation of the Canadian Patient Safety Institute and the various provincial counterpart organizations is meant to serve the purpose of coordination and inter-hospital learning, and one item on their agenda is to share learning from adverse events across organizational boundary. Actually nearly all national reporting systems quoted in Section 3.2 attempt to share lessons learnt from collected reports within their industry. Apart from adverse events, Perrow (1999) also recommends

“constant feedback about errors and a system-wide sharing of near misses”. He focuses on gathering data and disseminating information among organizations, not within them. Such industry-level, non-regulatory, inter-organizational reporting systems are exemplified by the ASRS (as illustrated in Figure 3.4) and an ASRS-based transfusion medicine reporting system (Battles et al, 1998). However, the effectiveness of dissemination varies, and no direct peer-to-peer sharing culture is created.

However creating direct inter-organizational learning culture and practices is far more difficult in hospitals than in other High Reliability Organizations (HRO). Some professional beliefs and norms in hospitals clash with HRO norms (Leape & Berwick, 2005; Thomas & Helmreich, 2002). According to Tamuz & Harrison (2006), many technical and social features of hospitals exhibit redundancy, but not all of these contribute to safety and reliability. Much of the gap between hospital realities and the HRO model reflects the fact that hospitals are professional bureaucracies (Mintzberg, 1979), where norms and routines are learned through professional socialization and authority flows through professional hierarchies. In addition, while clinicians readily shift decision-making responsibility in response to changing conditions (e.g., change to a readily available doctor for urgent operation instead of waiting for in-charge clinician), hospitals usually do not unless in case of hospital-to-hospital transfer

(Meyer, 1982). Tamuz & Harrison (2006) further adds that hospitals do not ordinarily provide fertile grounds for the development of well-integrated and cohesive cultures of reliability. Hospitals and health care as a whole are very complex (Gaba, 2000) and may be growing more so (Lake et al, 2003). Hospitals often encompass a myriad of sub-cultures that mirror the structural complexity of the hospital system and its occupational differentiation (Degeling, Kennedy & Hill, 2001; Edmondson, 1996; Ferlie et al, 2005; Sexton et al 2001; Singer et al, 2003). This renders the current inter-hospital learning environment weak.

3.5 The Safety Culture

It is believed that some individual attributes that contribute to the underreporting phenomenon stated in Section 3.3 can be abated if individual awareness to safety increases. Thus, apart from the incident management system as discussed in Section 3.2, safety concerns shall be built into every caregivers' mind. This can form a comprehensive safety culture that reinforces the incident management systems. Thus, researches on the necessary elements of safety culture will be reviewed in this Section.

Leadership action is required to build a culture of transparency which is learning,

prerequisite for safety to be successful and sustained. Morath & Turnbull (2005) summarize previous work by Reason (2003) and Uhlig (2002) and propose 4 supporting cultural features of a safety culture, namely: accountable culture, a just culture, a learning culture, and a culture of partnership. These are elaborated below:

(i) Accountable Culture

A culture of accountability has no room for blame or for shifting responsibility. Leaders shall accept full responsibility for patient safety, with all members and external partners share the obligation to continually create conditions for advancing patient safety. Creating such culture requires an accountability system at the individual, system, and governance levels, and it includes design and implementation of a work plan with measures, monitors, and reporting that can encourage learning and innovation. An accountable culture demonstrates several characteristics of high reliability, including understanding the boundaries of safe practice, and anticipating and planning for unexpected events. Besides, when errors do happen, the organization and its members shall exhibited apology, disclosure, and appropriate analysis and action to reduce the probability of recurrence.

(ii) Just Culture

A just culture requires timely, fair, and appropriate actions that are carried out when blameworthy behaviors have occurred. Blameworthy behaviors include intentional violation of policies and standards, consistently reckless behavior and carry out actions in the absence of knowledge. The Incident Decision Tree discussed in Section 7.2.1 and Appendix VIII, which was developed by Reason and later modified by the UK National Patient Safety Agency (NPSA) is a commonly recognized tool to assist judgment on whether a certain behavior is blameworthy.

(iii) Learning Culture

A learning culture has a deep appreciation for understanding how the system operates and why events occur. It has a robust reporting system as its intellectual foundation and encourages voluntary text-based reporting. It is clear that the purpose of reporting is for understanding and improvement. Complex, continuing conversations take place about the stories that emerge. There is continual learning about latent conditions, system vulnerabilities, and sources of success. New ideas and lessons from other domains of science and industry (as stated in Section 3.2) are brought forward and presented as examples from which to learn. New applications are tested in cycles of action and reflection. In a learning culture, gaps are made visible so that

team members can learn from them and bridge or eliminate them.

(iv) Culture of Partnership

A culture of partnership respects, values, and invests in effective teamwork and communication. This aspect of the organizational culture includes the patient and the patient's family as team members and recognizes multicultural competence as a mandate for an effective care encounter. The rights of the patient to be safe, to be informed, and to choose are protected and honored. A culture of partnership recognizes that "How the system performs, and how it is experienced, is based on the interactions of the people in that system" (Uhlig 2002).

Although hospitals realize the necessary components of a safety culture, culture change program that reinforce report capturing is still in its early infancy. As pioneer to such work, the UK handy management guidebook “Seven steps to patient safety” pinpoints the merit of patient safety movement in the UK healthcare system. The guidebook is developed by the National Patient Safety Agency, which aims to provide reference to National Healthcare System resources and some practical tactics in patient safety program implementation. The seven steps suggested is summarized in Table 3.5:

Table 3.5 National Patient Safety Agency "Seven Steps to Patient Safety"

Step	**Description**	**NPSA Resources**
1. Build a safety culture	Create a culture that is open and fair	Safety culture survey
2. Lead and support your staff	Establish a clear and strong focus on patient safety throughout your organization	Patient safety introduction video, patient safety e-learning program
3. Integrate your risk management activity	Develop systems and processes to manage your risks and identify and assess things that could go wrong	Incident decision tree
4. Promote reporting	Ensure your staff can easily report incidents locally and nationally	National reporting and learning system
5. Involve and communicate with patients and the public	Develop ways to communicate openly with and listen to patients	Guideline and training - being open
6. Learn and share safety lessons	Encourage staff to use root cause analysis to learn	Root cause analysis training, root cause analysis tools
7. Implement solutions to prevent harm	Embed lessons through changes to practice, processes or systems	Patient safety solutions

The UK safety movements have great implication for the rest of the world. In Hong Kong the Hospital Authority has incorporated patient safety elements into its risk management framework since 1999. The implementation framework is quoted in Figure 3.8. Through the implementation of the framework, the Hospital Authority aims at a holistic approach to facilitate Risk Management via partnerships with relevant stakeholders through an effective communication strategy.

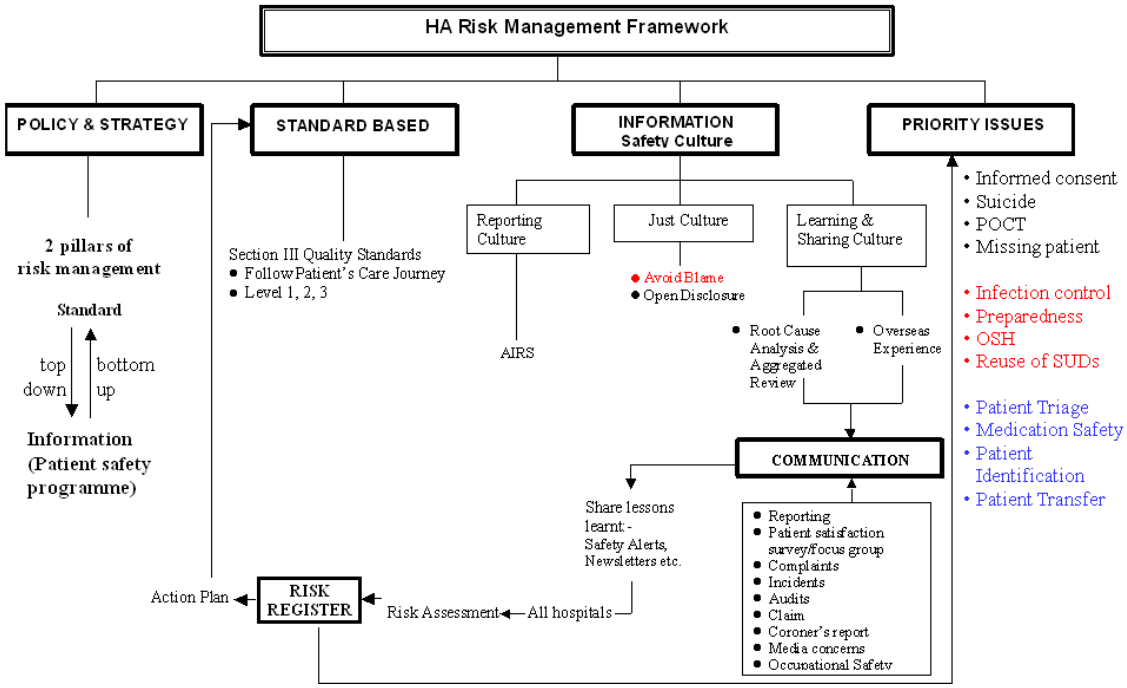


Figure 3.8 Hong Kong Hospital Authority's Risk Management Framework (HAHO, 2005)

4 PROJECT IMPLEMENTATION

A robust Near Miss reporting and sharing infrastructure reinforces a safety culture. The emphasis of this Chapter is on developing a culture and system to efficiently capture reports on Near Miss so as to uncover latent conditions and vulnerabilities.

4.1 Project Strategy

In reviewing the various impediments to Near Miss reporting and organizational learning theories, and also the local risk management strategies as set out in Section 2.1, the Project adopted a strategy that focused on both system and cultural aspects. The US clinical report "*To Err Is Human*" (IoM, 1999) calls for mandatory and voluntary reporting systems as part of a comprehensive strategy to improve patient safety. The study emphasizes that the purpose of a reporting system is to create an environment that encourages organizations to identify system vulnerabilities, evaluate the causes of those vulnerabilities, and take appropriate action to improve performance. Therefore, regarding the system aspects of the project, developments covering case collection, storage, analysis, knowledge dissemination, and knowledge revision were produced.

Apart from the building of a reporting system, an appropriate design of the Near Miss reporting form is also crucial. Reporting systems in high-reliability organizations including aviation, nuclear power, petrochemical processing, and military operations have evolved over three decades to the point of using the identified problem to understand the underlying causative factors and system vulnerabilities through focusing on Near Misses, providing incentives for voluntary reporting, encouraging confidentiality over anonymity, bolstering accountability, and emphasizing a systemic view (Barach & Small, 2000). From their experiences, the reporting system that asks, "What happened?" generates information that can be transformed into knowledge for informing system changes through cycles of improvement. It is thus the central theme of this project reporting content design. The Near Miss reporting form is attached as Appendix I.

Regarding the culture building aspect, different buy-in programs were catered for different segments of hospital staff. For example, a number of education programs were held and regular newsletters are published for the dissemination of lesson learnt. The main theme of the series of events was to change the attitudes, of both the management and frontline staff, towards errors. The desired outcomes for the series of activities in the management level were to promote ways for tackling problems

and learning from the experience. The activities also emphasized changes in staff practice from first-order problem solving to second-order problem solving as discussed in Section 3.3.1.

The Project also requires top management supports. If top management does not strongly support knowledge management in word, deed, and the behavior of individual executives, any knowledge management effort will be strained (Radding, 1998). Some motivation-and-reward systems are established in some participating hospitals too to encourage the capture and sharing of expertise. Besides, promoting open disclosure was another supporting strategy since disclosing necessary information is the foundation to system improvement, thus promoting disclosure through reporting is the first step to future action (Phimister et al, 2000). Moreover, while removing blame is neither feasible nor desirable (Reason, 1997), the project aims to nurture a culture that focuses on system factor and avoiding unnecessary blame.

Based on the above strategies, the project was divided into five implementation stages. The first stage was to establish all the different working groups, the implementation team, and the initial version of Near Miss Reporting Form. The second stage involved mainly a study among several pilot hospitals on the

effectiveness of various means for promoting Near Miss reporting, with reference to the feedback from the staff's opinion survey. The third stage was the stage of promotion and training. Various promotion programs for Near Miss reporting culture was launched. The fourth stage was the core stage with Near Miss reports feeding in through multi-channels and multi-media. Newsletters were issued regularly (every 1-2 months) to each staff member of the 10 hospitals to sustain or boost continual promotion of Near Miss reporting culture. The fifth stage was the ending stage, involving dissemination of experience and learning of Near Miss via various publications, and a Knowledge Management and Knowledge Sharing Conference.

4.2 Near Miss Reporting Channels

Near Miss reporting channels were set out to complement with strategy mentioned in Section 4.1. Three direct reporting channels and one transfer channel were designed for this project. The channels were namely: paper form submission through collection box or fax, phone-in interactive voice response hotline, web reporting, and transfer from Advanced Incident Reporting System.

Referring to Table 3.1 Incident Reporting and Analysis Model, the reporting system should be able to perform the first 3 functions in the management cycle.

Therefore a reporting feature, analysis/ classification feature and database storage are designed.

The electronic reporting form for data input was developed in the same format as the hard copy form as illustrated in Appendix I to ensure consistency. The system supported both Chinese and English input, as for the convenience of both Chinese and English users in Hong Kong.

The analysis feature was used for the primary analysis and classification. Basically, the feature allowed analysts to analyze and classify cases into different incident natures and locations types. The database stored the reported and analyzed cases, and also the information of user accounts. The database management system supported data import and export, so that different parties (hospitals) could share the information and data that is in their own database.

KMISS+ was a web-based Near Miss reporting platform designed by Ng (2005). The system was designed in a 3 tier structure as illustrated in Figure 4.1. It included a presentation layer, a web server and a database server. The users could access the system through Internet browsers. The system was developed and composed based on an Active Server Page (ASP) and JavaScript. It functioned in a Microsoft Internet Information Server (IIS). Microsoft SQL Server was used for

database management. The reason for using ASP in this project was because of the high integration with Microsoft products and the short development time. The whole system was hosted and maintained in the Microsoft Enterprise System Centre of the Hong Kong Polytechnic University.

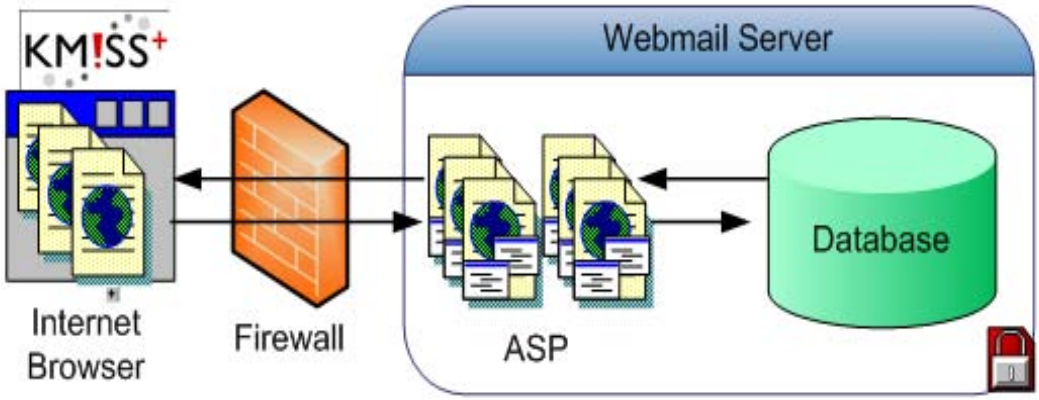


Figure 4.1 Three-Tier Structure of KMISS+ System

Most reporting systems reviewed in Section 3.2 usually focus on monitoring the trends without placing adequate emphasis on learning from the discrete solutions that reporters have adopted. Besides, in extracting trends and common attributes in such case pools, small variance between cases are ignored so that some less common interesting stories are neglected, as well as the learning from them. Therefore to facilitate a better inter-hospital learning process, the KMSS+ was designed to collected reports together with solutions that contributors had implemented from the 10 participating hospitals. The reports were then de-identified, classified and placed

in an Internet accessible environment for retrieval by participating hospitals, which is later named the “KMSS Solution Pool”. In other words, selected staff from the 10 participating hospitals would have the privilege to access reports and solutions contributed by different hospitals. This can serve as a learning and decision support tool for managers, helping them to identify solutions that other hospitals have implemented in specific areas, when they come across similar cases. No identifier such as hospital name, reporter name, patient name, exact time and exact location are shared so as to protect reporters and hospitals that contribute the reports.

Figure 4.2 illustrated the workflow of the KMISS+ system from report feed-in to analysis. For cases reported by hard copy form and the Interactive Voice Response (IVR) hotlines, the information were entered manually by designated staff into the electronic reporting form in KMISS+. After a period of time, members of the Near Miss team were responsible for the primary analysis and classification. The Near Miss analyst analyzed and classified the Near Misses. This process included a basic classification of Near Miss type and location. The taxonomy and database structure allowed the analyst to classify the Near Misses under more than one category. After completing the form, the analyst could go back to the list and select another case for analysis. All the information and knowledge of Near Misses were stored in the database for the future

dissemination.

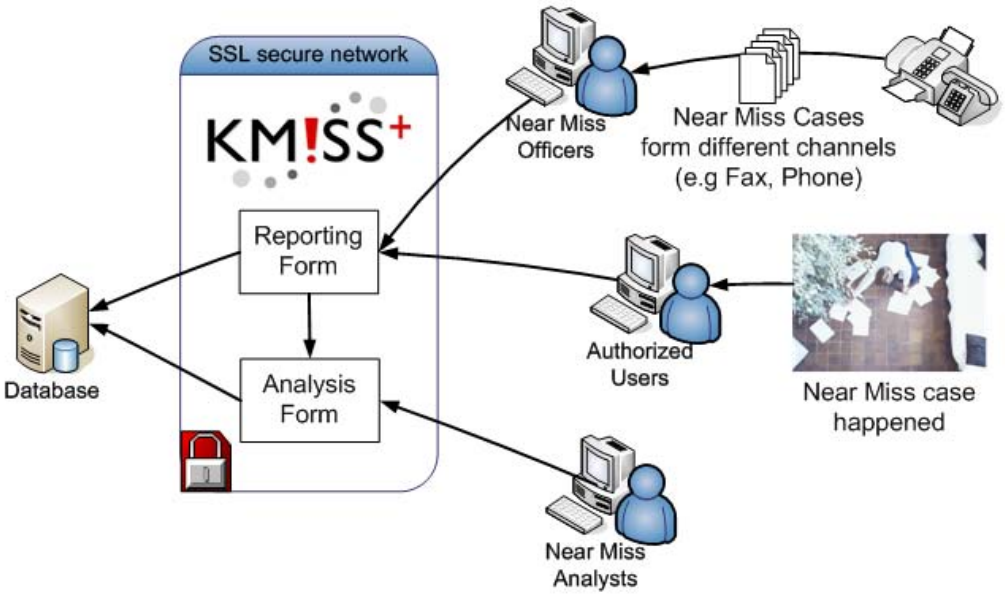


Figure 4.2 Workflow of KMISS+ System

Internet security was another critical issue in developing the KMISS+ reporting system. Some policies and technologies were needed to enhance the security of the system. First of all, there were 3 levels of access authority. General reporters used the general username to login the report, which was a single factor authentication procedure to reduce the technical barriers to reporting. Administrators of each hospital were assigned a username and a password for the login to the administrative platform so they could retrieve and process data from their respective hospitals. The super-administrator had the authority to access data from all hospitals. In addition, all

the information transmitted was encrypted by the Secure Socket Layer (SSL). With SSL, users connected to the system use a secure Uniform Resource Locator (URL) that begins with https://. The https:// indicated that it was trying to establish a secure connection with the server. A certificate and public key were sent from the server. After that the information is encrypted for transmission. It protects the information against anyone trying to intercept the encrypted messages.

Hospitals that were not comfortable with the direct replacement of their current reporting system with the KMISS+ reporting system, a data interchange system using excel format files as interface had been established. The structure of tables in that excel file was agreed by different hospitals so that they can import the data into their system.

Although it was commonly believed by different Knowledge Management consultancy groups that technologies played an important role in Knowledge Management projects because of their ability to assist management of explicit knowledge, the technologies used in the Project was fairly light-weight. Since the Project emphasized the promotion of reporting, sharing and learning, these light-weight technologies did not place heavy technological burden on staff, nor hospitals.

4.3 Project Governance Model

Interestingly, although the Project involved 10 hospitals from both the private and government sector, the Project has no rigid Project Governance Model that specifies the role and task of each hospital in the Project, nor any formal routine that frames the structure of meetings and sharing. The Project is led by a Project coordinator as indicated in Figure 4.3. Note that the role of “Implementation Team”, “Working Group”, and “Trainers” as shown in the figure can be duplicated. The author himself took all the three roles. Nearly all major decisions are made in the Project general meetings with the presence of the Project Working Group members from each Project hospital. The Project Working Group was formed at the beginning of the Project. It is composed mainly of senior decision makers and hospital risk management experts. For general planning and activity organization purposes, an implementation team was formed in the early phase of the Project as a subgroup of the Project Working Group. Routine communications are carried out by email, telephone and fax, which are all common and light-weight communication means.

For distributed activities run in each hospital e.g. mutual visits, there are also no rigid rules to follow and each hospital may decide their own mode of running. For example, although mutual visits and Knowledge Cafés were run in 3 hospitals in

early 2006, each organizer has chosen their own way of presentation, making each knowledge café a unique experience. Large scale events such as the two conferences have been organized mainly by the implementation team with assistance from other hospitals. In short, the Project Governance Model is very flexible; each hospital organically chooses their right place and right task in the Project so that achievements are always tailored and suited to individual hospital needs. By using this model, the Project has carried out a number of activities within the Project period. These are listed in Appendix II. Serving as the Knowledge Management Officer for the Project, the author assisted in the planning and implementation of all listed activities.

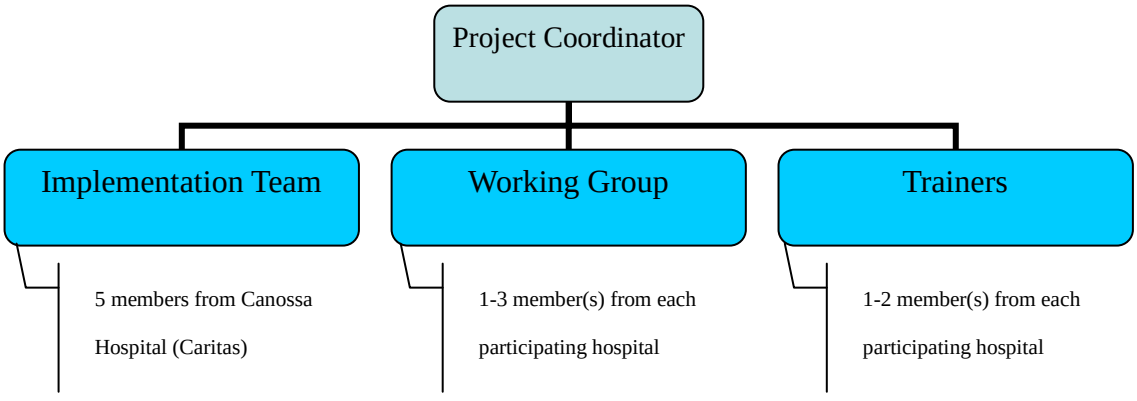


Figure 4.3 Project Governance Model

Apart from Project Governance, the Project Working Group also needs to consider data governance, especially when it possesses large amounts of sensitive information.

The shared Near Miss case pool is certainly one that requires close monitoring. Participating hospitals tended to formalize the sharing of Near Misses in the early days of the Project, like implementing several sharing sessions, and distributing memos and newsletters on lessons learnt. Written matters may be less interactive, but can have wider reach and a more long lasting effect. They are also for easier information control. Since general staff are less involved in face-to-face activities, the aforementioned written matters formed the backbone of knowledge sharing.

However the Project has to strive for a balance between sharing and confidentiality. Reason (1997) mentioned confidentiality being one of the key drivers of the promotion of reporting, since it will give a definite sense of security to reporters. Although the requirement for confidentiality is not strong for Near Misses because of its relatively less serious nature when compared to adverse incidents, people may not be happy for their names to be disclosed to other parties. Therefore in protecting reporters, the approach is to make it optional for staff to put down their names on reports. Their names and other identifiers (such as exact location and time) in report content will be removed before they are entered into the central database. Moreover, all shared materials shall not contain any identifier unless agreed by the reporter.

The physical location of the server containing the Near Miss case data is also an

important consideration. The hosting party shall be trustable in both technological protection and moral reputation. For example, the Aviation Safety Reporting System (ASRS) reviewed in Section 3.2.2 is hosted by NASA, which is a credited neutral body to the database content. The ASRS began through the work of physician Charles E. Billings. Funded by the aviation industry, the ASRS has operated for twenty-four years. In this system, the aviation industry uses NASA as an external body to which confidential narratives about error are submitted for the purposes of learning and developing capability in resilience and prevention (Reynard, Billings, Cheaney, and Hardy, 1986). The ASRS is trusted by aviation's sharp end: pilots, air traffic controllers, flight attendants, ground crew, maintenance workers, and other personnel. This Project adopted a similar approach and invited a third party, The Hong Kong Polytechnic University, to be the data hosting party.

Regarding general data management, data and information concerning project management are mostly disclosed by the coordinator in the Project Working Group meetings, to enhance the project transparency. Such disclosure policies are expected to be beneficial to the inter-hospital sharing and learning environment, which is advantageous for long term collaboration.

5 METHODOLOGY OF INVESTIGATION

The project deals with the creation of a near miss reporting and sharing system, building of a reporting and learning culture, and assessing the effectiveness of the system and culture in the local healthcare industry. This Section demonstrates the methodology used in collecting and assessing information, that reflect cultural changes and patient safety improvement actions.

5.1 Collection and Assessment of Near Miss Report

The Near Miss reporting form attached in Appendix I was designed for the purpose to collect incidents and suggestions to tackle the incidents. Therefore similar to most incident reporting forms around the world, date/time, location, and description of incident were mandatory fields. However the form did not meant to be a legal record, so it did not have mandatory fields in personal particulars. While considering that making personal particulars an optional field might in turn create difficulties in the investigation process for anonymous report, participating hospitals were of the view that some staff felt safer and more comfortable with anonymous report.

There were 2 open-end questions asking the reporter’s view on the contributing

factors to the Near Miss and possible solution to tackle them. Although the design might not be able to capture detail system error, it provided room for explanation. Little if any education were required for general staff to fill up the form, since the form contains no technical jargon used in any specific professions in healthcare settings, neither did any field that need professional knowledge to fill in (such as evaluation of patient recovery period after incident). Two checkbox questions were asked to obtain staff knowledge on the frequency of event occurrence for use in producing risk register.

Three direct reporting channels and one transfer channel were designed for this project as mentioned in Chapter 4. The channels were namely: paper form submission through collection box or fax, phone-in interactive voice response hotline, web reporting, and transfer from Advanced Incident Reporting System.

Upon collection, each Near Miss was classified according to the taxonomy set out in Appendix III. The taxonomy was developed based on the existing taxonomy used in AIRS, which has been reviewed in Section 3.2. Each Near Miss could be classified to more than one risk category. No upper limit of category assigned to a single Near Miss was defined. The classification job was performed by the risk managers in each participating hospital, who have solid

experience in classifying Near Miss and adverse clinical incidents.

The trend of the occurrence of Near Misses was periodically reviewed by the Project Working Group. In addition, Knowledge Cafés also become a methodology for hospitals to find out the issues and good practices in tackling identified hospital high risk areas. The methodology used in Knowledge Cafés was discussed in Section 5.2.2. While the cases and solutions collected were put on the KMSS Solution Pool for public access, the page click rate of the pool was also logged by page view counter to assess the popularity of the function.

5.2 Changes Assessment of Staff Attitude

There were various methods to collect information regarding changes of staff attitude before and after the Project: two surveys in the early and ending phase of the Project, observations of reporting trends, and interviews with middle management and executives from different participating hospitals. These methods were further described in the below sections.

5.2.1 Studies on Change of Staff Attitude

To investigate the change of staff attitude and knowledge on Near Miss before and

after the Project, two surveys were conducted to compare the knowledge and attitude change of staff in the Project, with the first one being the baseline.

The questionnaires, anticipated responses, and analysis methods of the first survey were developed in October 2004 in consultation with 3 senior staff in Canossa Hospital (Caritas). A pilot test was then conducted in a paramedical department with 10 staff in late October 2004, and the questionnaire was found to be generally understandable and unambiguous. The questionnaire was designed in Chinese and the translated version of the questionnaire was attached in Appendix IV(a).

The questionnaire consists of 3 sections. The first section includes 5 questions concerning respondents' concept on Near Miss. The second section includes 5 Near Miss scenarios describing risky circumstances of various degrees. The 5 scenarios quoted were:

Scenario 1: Wet floor

Scenario 2: Medicine differs from prescription

Scenario 3: Plastic piece found in food servings

Scenario 4: Medical equipment malfunction for 30 seconds

Scenario 5: Sundries blocking fire escape route

The scenarios were proposed by a team of 5 healthcare professionals from both medical and paramedical domains in Canossa Hospital (Caritas). The selection

criteria of the scenarios were: common to several positions in hospital, easy to visualize, and was likely induce more serious incidents. Respondents were to choose their possible reactions towards these circumstances, including no action, solve by myself, inform colleagues/solve with other, and report to senior (no matter the respondent has solved it or not). These reactions were considered mutually exclusive, and respondents could only choose one reaction to each scenario. Respondents also indicated their willingness to report each scenario on a 5-point scale (1 representing most unwilling, 5 representing most willing). The third section includes 4 questions concerning respondents' perception of preferred channels for reporting Near Miss, and of motivating factors and negative factors on voluntary reporting. This section was included for the purpose of designing the reporting channels and promotional means used in the Project, therefore this section were not compared in the second survey.

The survey was conducted in November 2004 in the 7 local private hospitals that have participated in the Project. 1,500 questionnaires were distributed to all kinds of hospital staff in 7 private hospitals, categorized into 5 groups: Doctors, nurses, allied health/paramedical staff, clerical staff, and supporting staff. Each hospital was responsible for distribution and collection of questionnaires in their hospital. The period from questionnaire distribution to questionnaire collection was around 1

month.

The second survey was conducted in April 2006 in the same hospitals as the first survey. The survey sample size, questionnaire design and distribution were similar to the first survey so as to yield a directly comparable result. Again the questionnaire was designed in Chinese and the translated version was attached in Appendix IV(b). The third section of the first survey was deleted as explained in previous paragraph. Meanwhile, three new questions on staff recognition to the Project were added to the questionnaire so as to investigate the learning of staff from the Project in different perspectives. An open-end question was also added to the end of the questionnaire asking which factors motivated them to report after the Project.

The survey inevitably had its limitations. To facilitate understanding by all hospital staff, the questionnaire were designed in a relatively simple manner. The number of questions was also limited. Complex and verification questions were avoided to further simplify the questionnaire. Because of the absence of verification questions, the accuracy of responses was difficult to be validated. Fortunately the effect of this limitation was lessened due to the presence of large sample size. On the other hand, the survey was best to be conducted in all participating hospitals and a few non-participating hospitals so as to broaden the comparison basis. However due to

administration and political concerns, the survey finally conducted in 7 participating hospitals only, yet it already formed an adequate foundation for comparison because the number of respondents in each hospital was large.

Another limitation was that the survey itself was inadequate to assess the safety culture of each hospital. To supplement the weakness, an established survey tool from the Agency for Healthcare Research and Quality (AHRQ) was adopted. This has been mentioned in more details in Section 5.2.3.

5.2.2 Observations and Interviews

Numerous sessions of cross-hospital discussion including 11 general meetings and 4 Knowledge Café sessions were held between November 2004 to October 2006 for representatives from participating hospitals to discuss implementation strategies, tactics and lessons learnt. Concerns and opinions of participants were noted and used as a data source in this thesis, with special emphasis on the observations in Knowledge Cafés and the behavior of Community of Practice. A Knowledge Café was defined as a way of bringing together a group of people who have some topic of common interest and who will be able to benefit from talking together and listening to each other on the subject of issues related to and surrounding that common interest (Gurteen & Remenyi, 2004). As an activity to facilitate sharing of knowledge across

hospitals, an approach modified from Gurteen & Remenyi (2004)'s methodology of Knowledge Café was adopted. The actual method in carrying out such event in this Project was described as follows.

About 20 to 30 people were invited to each Knowledge Café. Depending on policies of participating hospitals, participants in the Knowledge Cafés were either nominated by individual hospital or volunteered. Participants were mainly middle management, with specialty spanning from supporting to paramedical to medical. Badges were supplied to make sure that everyone knows the names of all the other members. Coffee and refreshments were set up so that participants could serve themselves.

The objective of the Knowledge Café was explained before the start of the session. For each session, several Near Misses were presented and participants were asked to discuss the root causes and possible solutions to the Near Misses. The organizer set 4-5 tables with 4-5 participants at each table. The most important issue was that the environment was not specially uncomfortable or hostile.

Arrange four 10-minutes sessions for discussion and assign a group leader in each table. After each session participants but not the group leader move to other tables and continue the same topic of discussion. The Group leader of each table briefs the new comers on what they have discussed in the table in the previous Session. After 40 minutes the leader of each table report their observation and learning from the discussions. The reporting shall not become a debate but shall be an exercise in reflecting on new ideas and new insights which individuals have been exposed to during the small group discussions. Hearing members of different small

groups reflect on what they heard will expose Knowledge Café members to an even wider perspective on the question posed. The reporting was within 20 minutes.

The Knowledge Cafés in the Project has several objectives as stated below:

(i) Brainstorm solutions for common but serious problems in hospitals such as patient fall

(ii) Facilitate inter-hospital learning utilizing stories

(iii) Sustain and promote the growth of a knowledge sharing atmosphere among hospitals through less formal gathering

(iv) Create a inter-hospital knowledge community on quality and safety in the long run so that such kind of sharing was self sustaining

The Knowledge Cafés has become one of the methodologies to assist collection of hospital common risk areas, and subsequently their root causes and solutions, which were mentioned in Chapter 6. Another technique that has been used in the Knowledge Café was reflective dialogue, which was a subset of action inquiry. According to Hord (1997), collaborative work was grounded in reflective dialogue, in which people conducts conversations to identify issues, problems, and learning points. Actually, in the absence of reflective dialogue, organizations might suffer from accumulation of problems and conflicts, which was an unhealthy situation for any organization.

In this sense, a small study on reflective dialogue was also carried out by the author in one Knowledge Cafés. In the study, several pieces of dialogue of a few participants randomly selected in different tables were recorded, each of around 2 minutes. Participants with a positive and negative attitude in the Knowledge Café would thus be identified. A piece of reflective dialogue with the identified participants were recorded and discussed so as to reflect the author's perception on his/ her barrier to sharing in the Knowledge Café.

As for the observations of the behavior in the Community of Practice, the author takes part in the community himself as both implementation team and working group member, and to record the communication, discussion, and learning behavior of the community. Although there could be chances to intervene the behavior of the community by the author's participation, such observation could reach a reasonable reliability over a long observation period for 2 years.

Apart from the above observations, the key organizational indicators as well as evaluation of implementation tactics presented in the Chapter 6 were obtained through interviews with middle management and executives from different participating hospitals in January to February 2006. Although no structured questions were asked in the interviews, questions surrounding several attributes in their

respective hospital were asked, which includes their actual works on “Formalization of Quality, Safety and Risk Management Program”, “Availability of Continuous Learning Opportunity (Profession & personal development)”, “Strictness of Disciplinary policy”, “Teamwork versus hierarchical”, and “Degree of Technology adoption”. The key organizational indicators were developed in consultation with the first Project Coordinator as key criteria of assessing participating hospitals and hence the basis of formulating project strategies. Assessments were made mostly based on the written policies in each hospital, supplement with clarifications with executives. The reporting trends of each of the participating hospitals were also noted as a quantified measurement of the success of implementation.

5.2.3 Hospital Patient Safety Culture Survey

As cited on the Agency for Healthcare Research and Quality’s website (AHRQ, 2006), the Hospital Survey on Patient Safety Culture was developed by a private research organization under contract with AHRQ. The primary aim of the survey was to provide a measurement tool to assess the culture of patient safety in health care organizations. The survey was pre-tested by AHRQ funding institutions with more than 1,400 hospital employees from 21 hospitals across the United States to ensure the items were understood and relevant to patient safety in a hospital setting. A

sample of the survey questionnaire was attached in Appendix V.

The survey questionnaire and its accompanying toolkit materials were designed to provide hospital officials with the basic knowledge and tools needed to conduct a safety culture assessment, along with ideas for using the data. Part One of the Hospital Survey presents issues inherent to the data collection process and the overall project organization. Part Two includes the survey questionnaire, followed by a separate overview of the included items, grouped according to the safety culture dimensions they were intended to measure and the reliability findings derived from the data.

The survey places an emphasis on patient safety issues and on error and event reporting. The survey measures seven unit-level aspects of safety culture:

U1 Supervisor/Manager Expectations & Actions Promoting Safety

U2 Organizational Learning—Continuous Improvement

U3 Teamwork Within Units

U4 Communication Openness

U5 Feedback and Communication About Error

U6 Nonpunitive Response to Error

U7 Staffing

In addition, the survey measures three hospital-level aspects of safety culture:

H8 Hospital Management Support for Patient Safety

H9 Teamwork Across Hospital Units

H10 Hospital Handoffs and Transitions

A more detail description on the analysis framework on the questionnaire was attached in Appendix VI. Two participating hospitals, one private and one public, conducted the AHRQ patient safety survey in order to evaluate their own safety culture in mid-2006. Results were compared with the benchmark data available on the AHRQ website: www.ahrq.gov. The results of the surveys also act as supporting information to the cultural assessment in the 2 mentioned hospitals.

5.3 Comparative Study on Promotional Practices

A comparative study on various methods for the promotion of Near Miss reporting among 7 private hospitals was carried out between July and October 2005. The aim of the study was to identify the effectiveness of different promotional practices of Near Miss reporting in hospitals with different backgrounds. Comparisons were made based on the number of Near Misses collected and review with hospital management. The promotional practice in different hospitals, which were decided

after the brainstorming and discussion processes of the Project K – Miss Share Working Group, was stated in Table 5.1. Participating hospitals voluntarily undertook some promotion tactics based on their capabilities to carry out the stated promotional means. Some of the promotional means were actually current tactics of some hospitals in facilitating reporting in other domains, such as medication error and anesthesia problem, which most hospitals feel comfortable to adopt.

Table 5.1 Design of Comparative Study

Promotion Tactics	Hospital						
	A	B	C	D	E	F	G
Mandatory training	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tangible incentives *	Yes						
Acknowledgement to reporter	Yes			Yes	Yes		
Assure timely feedback #			Yes	Yes	Yes		
Incorporated into all dept meeting agenda		Yes				Yes	
Open sharing Session	Yes		Yes	Yes	Yes		
Network of facilitator	Yes		Yes^				

* Credit point added as a sticker on staff card for display, and to personal file of individual staff member with all known Near Miss reporting
Credit point added to departments corresponding to the number of known Near Misses reported by the respective staff members

\# Acknowledgement of receipt of report was provided to reporter within 3 days

Info post-ups on notice board(s) with updates every 1-2 weeks : highlights of reports and solutions, statistics, etc

^

Indicating current practice instead of additional intervention

Since different hospitals have different means of promotion, different sizes, stages of implementation, and cultural backgrounds, this study put more emphasis on self comparison in the number of Near Miss reports. Evaluation on any difference in number of reports collected as observed in this study will be made according to different strand of information collected in the various studies stated previously.

6 FINDINGS ON HOSPITAL HIGH RISK AREAS AND STAFF ATTITUDE CHANGES

This Chapter presents a summary of findings in high-risk areas from the pool of cases collected, together with the changes in staff attitude within and across hospitals. These changes came about as a result of the implementation of various activities as stipulated in Chapter 4, and was assessed using the methodologies mentioned in Chapter 5.

6.1 Hospital High Risk Areas

Between 1st July 2005 and 30th June 2006, a total of 1019 Near Miss reports were collected from 10 participating hospitals. The trend of Near Misses reported was overall speaking steady, with peak of around 110 cases in Dec 05 and trough of around 70 cases in Mar 05. The average monthly volume of report received was about 90. The average number of reports collected in 2006 (~70 per month) was apparently lower than that in 2005 (~100 per month), which might due to the completion of promotion activities. The trend of reporting has been shown in Figure 6.1. Of the 1019 cases, 478 cases were with factors presented and 650 cases were

with solutions adopted in the respective hospital. Since there were large numbers of Near Misses happened in each hospital everyday, it was basically unfeasible for each hospital to identify and tackle all of them because of limited resources. It was especially true for middle management, since decisions to be made by them were expected to increase dramatically if every Near Miss was identified and reported. It explained why there were some cases without any follow-up actions, i.e. no occurring factors and solutions.

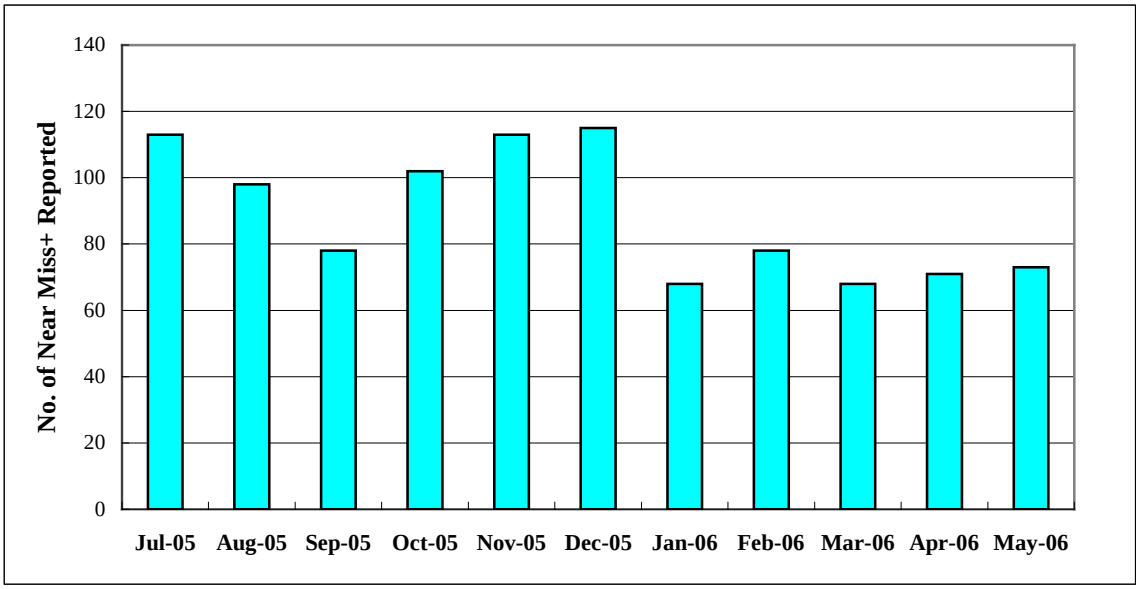


Figure 6.1 Numbers of Near Misses Reported

As with adverse incidents, most Near Misses happened between 7am and 3pm (62% of total occurrence) when compared to other timeslots (28% of occurrence happened between 3pm-10pm; 10% of occurrence happened between 10pm-7am). This might be explained by the massive number of operations and large patient flow during those

hours. Besides, most collected cases were reported within a week after the occurrence of the incident, which meant that Near Misses were brought to management attention fairly promptly. Regarding reporter position, it was observed that the majority group to report Near Misses was registered/ enrolled nurses. Since nurses make up the majority of hospital staff force and were the frontier to patient care, their participation were the most important. In average, about 60% of staff composition in hospitals were nurses. Since the reporting percentage of nurses (72% as illustrated in Table 6.1) was higher than their respective proportion of staff composition in hospitals, it was claimed that nurses were keener to report Near Misses at the time of the study. On the contrary, the group that was least keen to report was doctors (1% of reports proportion versus 3-6% of hospital staff composition).

On the other hand, approaching 70% of reporters recalled prior experience or knowledge of similar Near Misses. More than 70% were considered to be possible to be recurred again by reporters, bearing in mind that 6% of total reported Near Misses were considered almost certain to happen again.

Collected Near Misses were classified according to the taxonomy as stated in Figure 6.2. From the Figure one could also observe deviation in the numbers of Near Misses

in different areas. Judging from the frequency of occurrence and possible risk in developing into more serious incidents, several risks of top priority that need to be tackled have been identified.

Table 6.1 Distribution of Role of Staff who have Reported Near Misses

Position	**Distribution in Percentage of Reporting**
Doctor	1%
RN/EN	72%
Paramedical	13%
Office/Clerical	6%
Supporting	8%

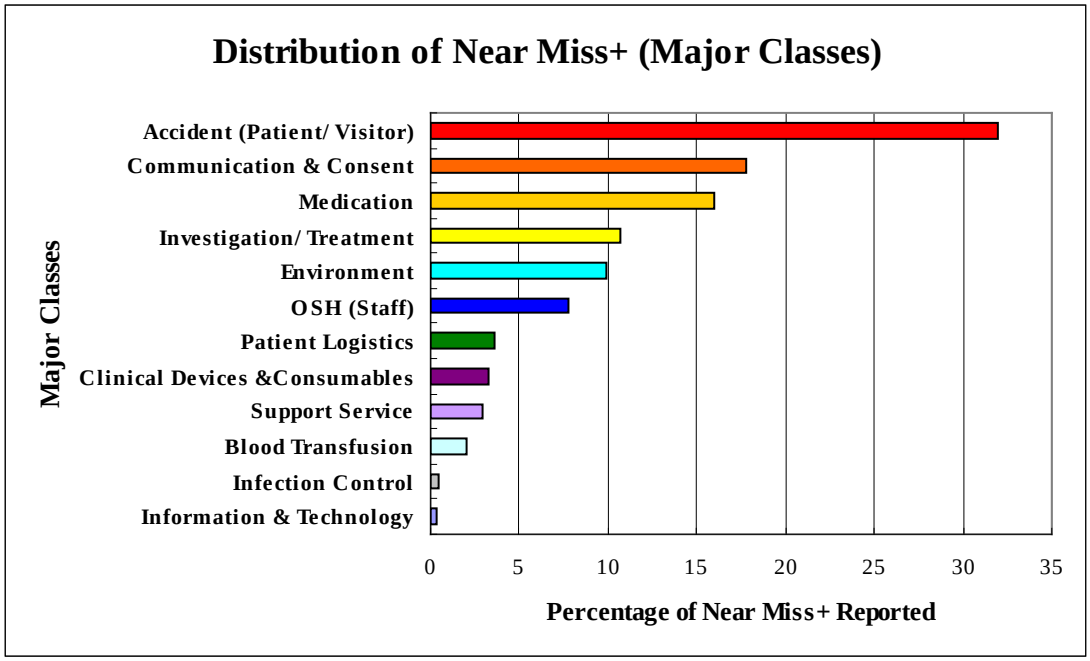


Figure 6.2 Classification Schema and Number of Near Misses in each area

The risk of the highest priority was “accident with patients/visitors”. This major class included the two most frequently occurred incident types “patient fall” and “violence behaviour of patient/visitor”. The second largest major risk class was “communication and consent”, which included errors such as “discrepancy in documentation/filing” and “patient mis-identification”. The third major risk class was “medication”, which includes errors in all drug handling processes. Some of the high risk types under these major risk classes were selected to be studied and discussed in Knowledge Cafés, say for example, patient fall.

Indeed, patient fall was usually quoted as one of the top risk areas in hospitals around the world, with no exception in HKSAR. The KMSS Solution Pool read that there were a number of common factors leading to patient falls, including inadequate pre-hospitalization fall assessment, patient unawareness to call for help, patients' attempt to strip off from restrain equipment, slippery floor or shoes, and inadequate use of assistance tools such as wheelchair. Frequently quoted follow up to such Near Misses included “reinforce patient to use call bell if necessary” and “increase the level of monitoring”. However the effects of the solutions were limited. In the brainstorming procedures in Knowledge Cafés, some innovative suggestions were brought out, such as the redesign of the call bell. In some post-fall assessment with patients, it was found that patients were cautious with the use of call bell. In some

hospitals the design of call bell was like a missile launcher button with red/yellow alert strip, so it was speculated that it was the reason why the hit rate was so low. In redesigning the call bell, the problem was expected to be largely mitigated. Like the case of patient fall, some other hospital high risk areas were identified and discussed with recommended suggestions circulated among participating hospitals.

6.2 Cross-Hospitals Staff Attitude Assessment

Looking at the intra-organizational behaviors of participating hospitals, this Section summarizes findings from two staff attitude surveys, assessment of systems in participating hospitals and observations of the development of reporting behavior.

6.2.1 The Across-Hospitals Staff Attitude Survey

For the survey in Dec 2004, 1,290 questionnaires were returned and validated, representing an 87% response rate. The final sample included 24 doctors, 587 nurses, 214 allied health/paramedical staff, 152 clerical staff and 313 supporting staff. The results revealed that the perception on Near Miss varied across hospitals on ANOVA. However there was no evidence that staff from different hospitals or different professions behaved differently when encountering Near Misses. Over 60% of respondents tended to tackle Near Miss scenarios together with colleagues, while

around 30% of staff tended to report Near Misses to seniors. The willingness to report Near Misses of healthcare professionals (i.e. doctors, nurses and paramedical staff; average willingness to report = 3.95 out of 5-point scale, δ =0.86) was similar to that of other supporting staff in hospital (i.e. clerical and supporting staff; average willingness to report = 3.82 out of 5-point scale, δ =0.94).

From the survey it was also found that respondents were slightly favored (3.56 out of 5-point scale, δ =0.95) towards providing their names and contact information in voluntary reporting. “Near Miss discussion included in departmental meeting” (45.2% of respondents) and “timely feedback” (54% of respondents) were the 2 motivation methods with highest respondents’ acceptance. Most respondents including senior colleagues (59.1% of respondents) favored an internal reporting channel and a hospital responsible team (43.7% of respondents) rather than an external/ third-party channel (Average 12.1% of respondents). The observation was consistent across hospitals as well as across occupations. It was suggested that the observation showed respondents’ trust in their own hospital regardless of the possibility of being investigated, which was an observation that supported the response on the question concerning barriers in voluntary reporting.

It was observed that an “Independent Near Miss reporting forms through collection

box/ fax" were highly favored (70.5% of respondents) as the means for report collection when compared to the "combined Near Miss and Adverse Incident Form". So it was believed that hospital staff had very different perceptions of adverse incidents and Near Misses, and mixing them into one reporting form might strongly discourage staff from reporting Near Misses since hospital staff tended to avoid the "devilish" adverse incident form. Therefore contrary to most current practice worldwide that combines Near Misses and adverse incidents into a single reporting form, the Project adopted a separate Near Miss Reporting Form.

In light of the preferences indicated in reporting channels, three channels of reporting were specifically developed: paper/fax, web reporting, and voice capture reporting through the phone. Phone reporting (20% of staff preferred this as a reporting channel) was of particular merit in the Project. As Dave Snowden (2004) stated "We could always know more than we could tell, and we will always tell more than we could write down". In addition to the ease of knowledge sharing by verbal rather than written format, phone reporting also allowed staff of all categories to report Near Misses.

Some researchers named anonymity to be a preferable choice in early implementation when designing the content to report (Barach and Small, 2000),

while some others took just the opposite viewpoint (O'Leary and Chappell, 1996; Phimister et. al, 2000). Since respondents were neutral (3.56 out of 5-point scale, δ =0.95) on providing their names and contact information in voluntary reporting, the Project allowed reporters to optionally put down their name in the Near Miss Reporting Form. For reporting forms without names and contact information, the reports were treated as supporting information to similar cases. For reports with contact information, they were tackled with normal report handling procedures, which varies across hospitals.

Apart from this, several organizational indicators that might affect the promotion of Near Miss reporting and knowledge sharing, as mentioned in Section 5.2.2, were assessed in the 7 hospitals which participated in the survey. They were coded Hospital A to Hospital G, while there were also 3 additional hospitals coded Hospital I, J and K which were not assessed here but involved in other activities. The assessment was conducted before the formal opening of the centralized reporting channel on 1st July, 2005, and the result was shown in Table 6.2.

Table 6.2 Key Organizational Indicators in 7 Hospitals

Attribute		Hospital						
		A	B	C	D	E	F	G
Size of Hospital		Small to Medium	Medium	Large	Small	Small	Large	Small to Medium
% of staff claims to know the concept of Near Miss (From survey in Dec04)		53	31	79	18	24	20	34
Average Staff willingness to report Near Miss *	From survey in Dec 04	4.00	3.84	3.84	3.72	3.96	4.12	3.89
	From survey in Apr 06	4.03	3.79	3.62	4.25	4.06	4.03	4.08
Quality, Safety and Risk Management Program		Departmental centered, coordinated through committee	Departmental centered, coordinated through committee	Formalized by Quality & Safety department	Centralized to top management	Centralized to top management	Formalized by Quality & Safety department	Departmental centered, coordinated through committee
Learning Opportunity (Profession & personal development)		Continuous Medical & Nursing Education. Some development talk	Continuous Medical & Nursing Education.	Continuous Medical & Nursing Education. Plenty development activities	Continuous Medical & Nursing Education.	Continuous Medical & Nursing Education.	Continuous Medical & Nursing Education. Plenty development activities	Continuous Medical & Nursing Education. Some development activities
Disciplinary policy		Loose	Loose	Fair	Fair	Fair	Strict	Loose
Teamwork versus hierarchical		Tend to hierarchical	Tend to hierarchical	Tend to hierarchical	Tend to hierarchical	Tend to hierarchical	Highly hierarchical	Tend to teamwork
Technology adoption		Some	Some	Strong	Limited	Some	Strong	Some

* Rating: 5-point scale, with 5 being the most willing and 1 being the most unwilling

Further to the above information, participating hospitals were all community

hospitals with fairly similar service domains, and have passed different international hospital-wide quality standards. All hospitals required their clinical staff to fulfill continuous medical/ nursing education as a mandatory professional development strategy.

In the second survey conducted in April 2006, 1400 questionnaires were distributed and 1208 questionnaires were returned and validated, representing an 86.8% response rate. The final sample included 20 doctors, 557 nurses, 174 allied health/paramedical staff, 154 clerical staff and 303 supporting staff. Overall speaking, over 50% of respondents tended to tackle different Near Miss scenarios together with colleagues, which was comparatively fewer than the first survey. However, the tendency to report Near Misses to seniors increases from around 30% in the first survey to nearly 40% in the second survey. However, the tendency to report to seniors increased significantly (as shown in Figure 6.3) in 3 out of 5 scenarios on ANOVA. Smaller hospitals have shown an increase in average willingness to report Near Misses through the centralized channel, however the 3 larger hospitals have shown some drop in the same figure.

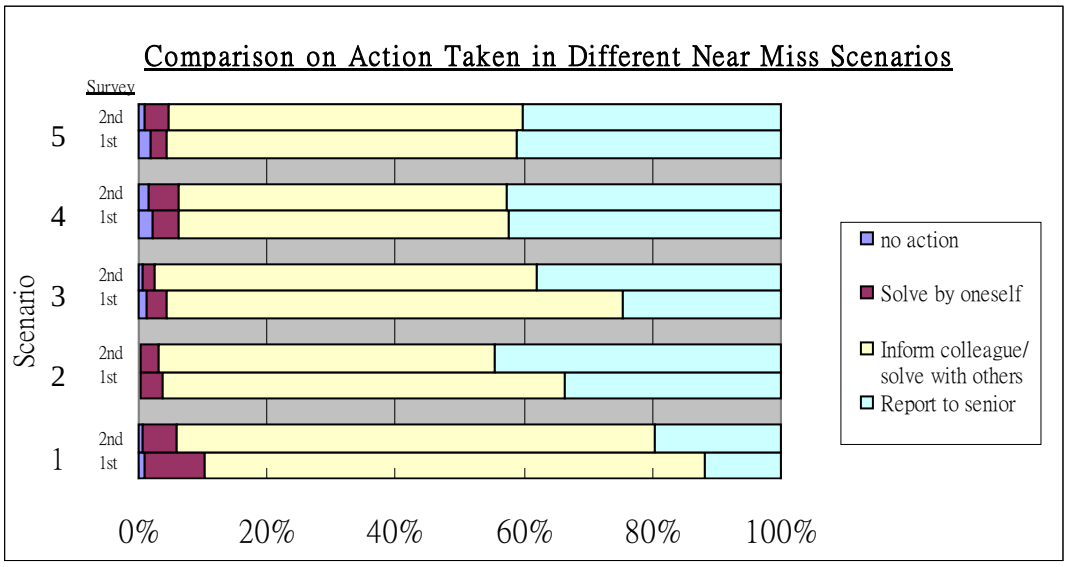


Figure 6.3 Comparison on action taken in different near miss Scenarios

In the second survey, about 81% of staff reported that they at least came across the topic of Near Misses occasionally in their workplace in the previous year. They came across the topic mostly through internal meetings and seminars (74.8% of total respondents), followed by internal documents and minutes (50.3% of total respondents), while the other channels were also significant and received at least 20% of total staff recognition. On the other hand, about 2/3 of staff claimed gaining more knowledge on the meaning and the function of reporting Near Misses.

In the first survey, the extent of different barriers limiting staff from reporting Near Misses was identified. “No suitable reporting mechanism” (48.8% of respondents) and “feeling of unveiling others’ fault” (41.3% of respondents) were the 2 largest barriers in voluntary incident reporting and the observation was consistent across all occupations. For the same question in the second survey, “Feeling of unveiling

others' fault" (27.3% of respondents) was the only choice that exceeded 20% of respondents agreed to. Noting that the there was one additional choice of answers in the second survey, which said "no barrier", the results of this question from the first and second survey might not be directly comparable. The detailed responses to this question in the first and second survey were given in Figure 6.4 and Figure 6.5 respectively. Figure 6.5 also illustrated that in later phase of the Project, "no barrier" had been the dominating response. One might also note from the Figures that the differences in responses across different occupations in hospitals was significant, which worth further exploration.

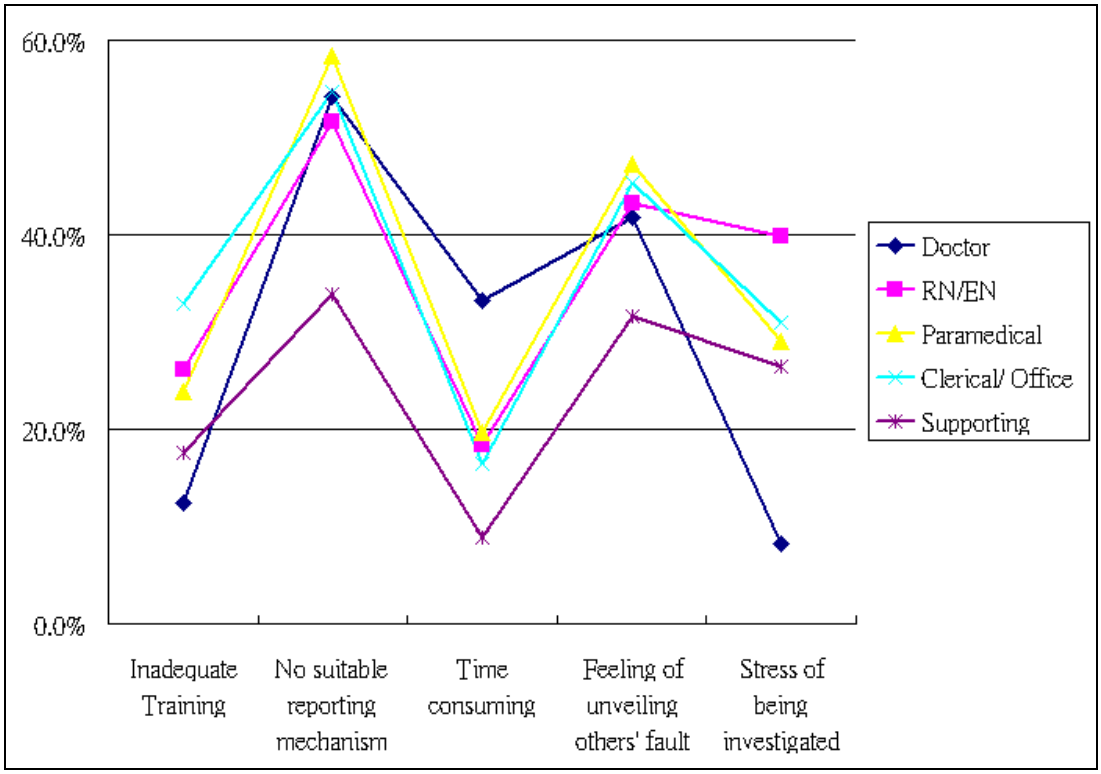


Figure 6.4 Staff Responses to the Question on Barrier of Reporting in the First Survey

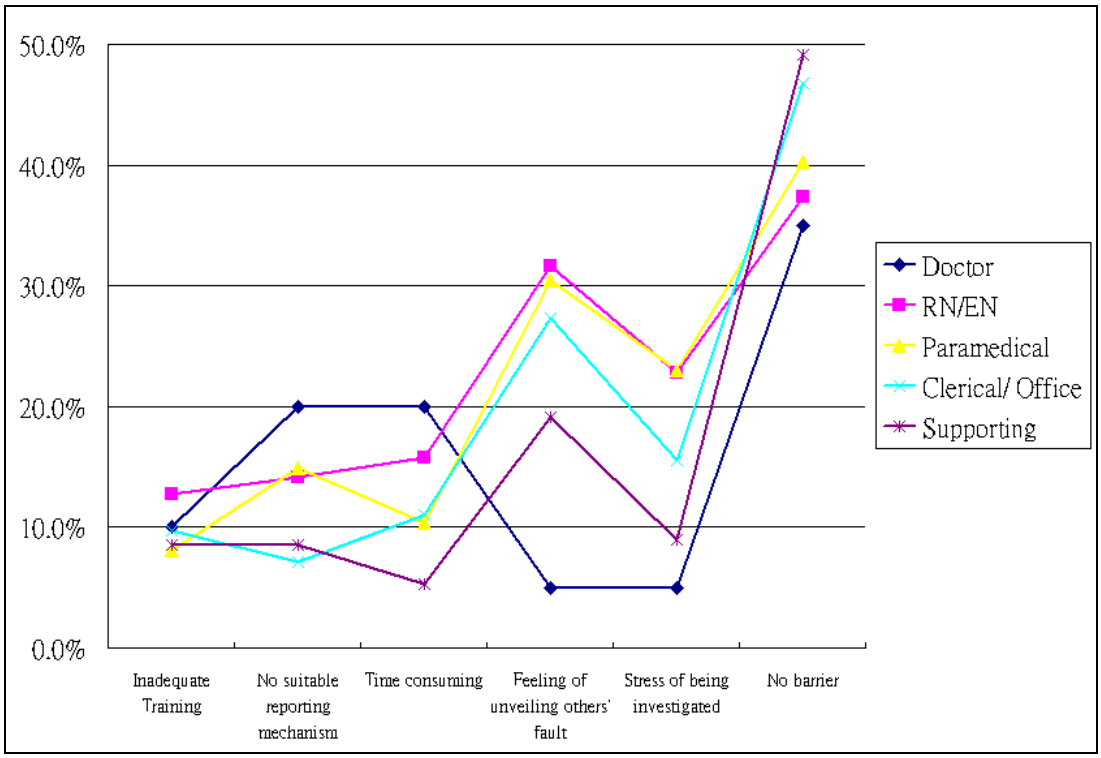


Figure 6.5 Staff Responses to the Question on Barrier of Reporting in the Second Survey

It was noted that in both surveys, nurses were the group that had the concerns in the barrier "Stress of being investigated". Nurses were also the leading group that had the concern "feeling of unveiling other's fault". Supporting staff were generally less hesitating on all of the given barriers in both surveys. "No suitable reporting mechanism" had descended from the place of biggest barrier to a relatively trivial one.

Despite of the responses on the barriers noted above, interestingly in the second survey, 40% of staff claimed that they had reported at least one Near Miss case in the previous year, counting to almost 500 staff out of the 1208 staff whose questionnaires

were being processed. Taking a simple projection that there were a total number of around 7000 staff in all participating hospitals, the total number of report on Near Miss received should be no less than 2000. However this was obviously not the case as discussed in the next section.

6.2.2 Hospital Reporting and Learning Behaviour

Reporting channels were formally opened on 1st July 2005. Between July 2005 and Nov 2005, the total number of reports collected through established channels in all participating hospitals was 392, with detailed breakdown illustrated in Table 6.3.

Table 6.3 Number of Reports Collected through Established Channels

Hospital	Month of Reporting				Total
	7/2005	8/2005	9/2005	10/2005	
A	10	17	18	26	71
B	5	3	0	1	9
C	31	20	28	32	111
D	1	0	0	1	2
E	4	4	0	1	9
F	3	4	1	2	10
G	18	12	4	1	35
H	10	10	7	10	37
I	19	16	11	14	60
J	14	12	9	13	48
Total	115	98	78	101	392

To analyze the difference in the number of reporting across the seven hospitals, one might refer to three sources of materials. First, during the stated period, different hospitals utilized different interventions to promote the reporting of Near Miss as illustrated in Table 5.1. This might in turn produce some immediate effect to the number of reports collected in each hospital. Second, the key organizational indicators mentioned in Table 6.2 had provided some background on the soil fertility of each hospital for the nurturing of a good reporting and learning culture. Third, the attributes of safety culture, which was assessed through the use of the AHRQ's Patient Safety Assessment Survey in Hospital A and H, could also be another piece of information that assisted the understanding of the development of reporting trend.

It was observed that the reporting behavior in hospitals A, C, and G were relatively stronger when compared to other hospitals as measured by the number of reports received. Moreover, hospital A has shown an increasing trend, while hospital G had shown a declining trend. Voluntary participation in hospital A was particularly high in the later stage of structured training, which might be explained by its relatively stronger training activities and incentive program. Team learning activities including sharing in meetings and trainings among management staff on Near Miss were identified in all hospitals but they were all in the preliminary stage.

Apart from the above mentioned learning environment, according to the safety culture attributes proposed by Morath and Turnbull (2005) as discussed in Section 3.5, “just culture”, “culture of partnership”, and “accountable culture” were crucial to encourage staff to voice out system errors. The presence of a “just culture” was claimed by all hospitals, which were evident by the established rules and guidance on how to tackle Near Misses fairly. However where the rules and guideline were in force properly were not assessed. Hospital A further extended the concept of fair blame even to no blame. For culture of partnership, hospital A tried to incorporate patients’ effort into the role to identify Near Misses by adding one question “Any Near Miss observed?” in a customer opinion survey. Apart from this no hospitals showed any significant movement in achieving culture of partnership. For an “accountable culture”, one characterized move in Hospital C was the formation of a risk management representative network that stretched inside hospital, which was composed of representatives from each functional department/ strategic business unit. The representatives were accountable to risk in their respective departments. To provide incentive on increased accountability, Hospital C was considering formally allocating 1 working day per week for the risk representative to deal with risk related issues. All hospitals’ guideline read that they practiced personal accountability for problems rather than team responsibility.

One special observation from Hospital A was that the hospital did show whole hospital effort in early stage of promotion of Near Miss reporting. The self-learning DVD as mentioned in Appendix IV was actually an in-house production of Hospital A. Most hospital staff were keen in the video-shooting process, with around one-fifth of the hospital staff participating in the DVD production. This might in turn electrified the ownership of hospital staff to the Project.

Observations in cross-hospital sharing revealed that different hospital experienced different levels of difficulty in facilitating management buy-in. It was observed that not all participating hospitals possessed a high level of executive buy-in, as demonstrated by the differences in degree of participation of executives in events and meetings, and resources allocated in committing the Project. Executives from hospitals B, D and F exhibited relatively low commitment under the above criteria.

6.2.3 Hospital Patient Safety Assessment Survey

Two participating hospitals including one private (Hospital A) and one public (Hospital H) participated in this survey in Aug 2006 as mentioned in Section 5.2.3. 699 valid questionnaires were collected in the Hospital H, while 167 valid questionnaires were collected in Hospital A. Results were classified according to the methodology specified by AHRQ (2006). Figure 6.6 was the result from a Hospital

H.

Utilizing the analysis framework provided in the AHRQ's website, which was also mentioned in Section 5.2.3 and attached in Appendix VI, 10 safety dimensions had been assessed. As a recall, the dimensions were namely:

U1. Supervisor/manager expectations & actions promoting safety

U2. Organization learning-CQI

U3. Teamwork within unit

U4. Communication openness

U5. Feedback & communication about error

U6. Non-punitive response to error

U7. Staffing

H8. Hospital management & support for patient safety

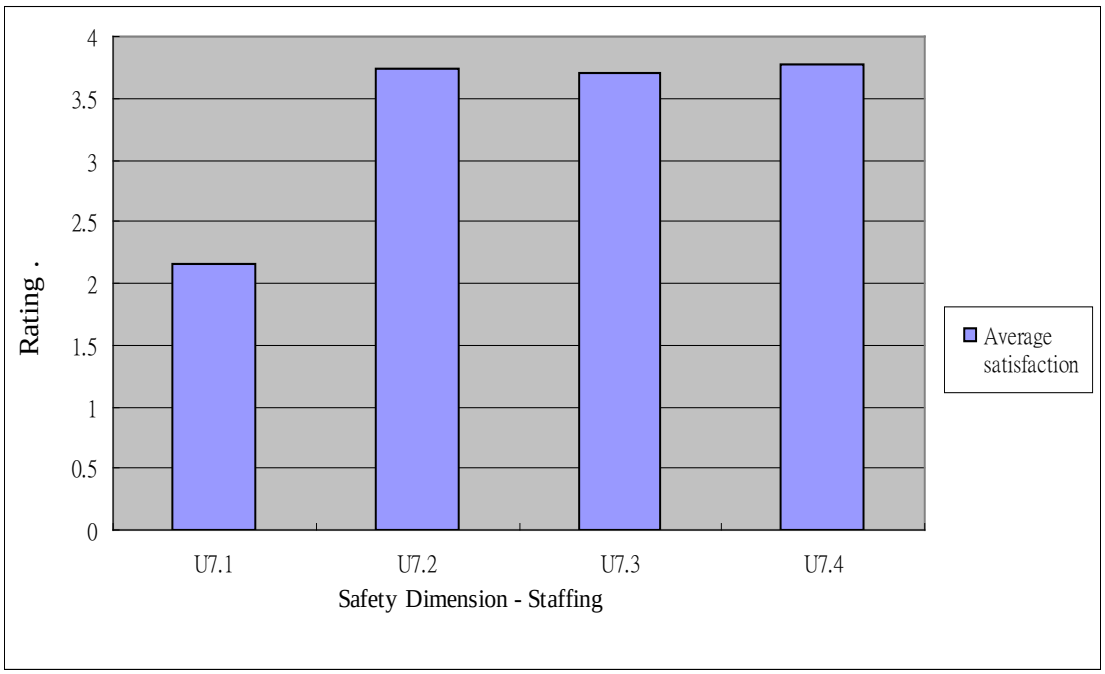
H9. Teamwork across hospital unit

H10. Hospital handoffs & transitions

From Figure 6.6 one could observe that the domains U1 to U5 yield satisfactory results across different levels of staff, and the overall safety culture index was also satisfactory (5 being the highest, 3.72 for top management, 3.75 for middle management, 3.59 for frontline). However the domain "U7 Staffing" gave an apparently weaker result. In order to investigate the phenomenon, the Figure 6.7 below provided a microscopic view of the items composing "U7 Staffing" in the survey.

Figure 6.6 Summary of Results from AHRQ's Patient Safety Survey in a Hospital H

It was obvious that the satisfaction to U7.1 "we have enough staff to handle workload" was exceptionally low (5 being the highest, 2.15 being the lowest for the item). In fact, this item gave the lowest positive result in the whole survey. While the second lowest items "There was good cooperation among hospital units that need to work together" yields a result of 3.35 over a 5 point scale, it was believed that inadequate staffing was the single largest impediment to the building of hospital and patient safety in the hospital.



U7.1. We have enough staff to handle the workload
U7.2. Staff in this unit work longer hours than was best for patient care
U7.3. We use more temporary staff than was best for patient care
U7.4. We work in “Crisis mode” trying to did too much, too quickly

Figure 6.7 Average Satisfaction of Staff in the Domain U7 - Staffing in a Hospital H

Comparing to the results of Hospital H in Figure 6.6, the results from Hospital A in Figure 6.8 had shown a similar safety profile. From the chart one could observe that the Hospital patient Safety Culture portrait of Hospital A was similar to the portrait of Hospital H stated in Figure 6.6. Domain U1 to U5 yields relatively high rating, while U7 Staffing and H9 Teamwork across hospitals were the 2 with lowest satisfaction. However the staffing problem in Hospital A was not as harsh as Hospital H.

Figure 6.8 Summary of Results from AHRQ's Patient Safety Survey in Hospital A

6.2.4 Observations in Structured Learning Activities

The Project K – Miss Share differed from traditional Incident and Near Miss Management programs quoted in Section 3.2 in the sense that the Project put considerable emphasis on facilitating peer-to-peer learning including hospital-to-hospital sharing. The "KMSS Solution Pool" mentioned in Section 4.2 and Knowledge Cafés mentioned in Section 5.2.2 were designed for the stated purposes. This Section reviewed the effectiveness and usage of these activities, and also the behavior of the knowledge community beyond these activities.

Regarding the "KMSS Solution Pool", although the Project Working Group

acknowledged the usefulness of the system, only about 627 page views on the case and solution pool were logged until 1st July, 2006, which was exactly a year after the commencement of the web site. The web site was being promoted through regular newsletters distributed to frontline staff of participating hospitals, and through announcement by members of the Project Working Group in individual hospital. Judging from the large distribution number of the newsletters (10 issues, each of around 2000 copies) and long time of promotion, it was claimed that the system utilization was unsatisfactory.

From the microscopic viewpoint, since the Project involved the collaboration between the private and public sector of healthcare service, the Project also served as a bridge for either side to access the succulent resources and network of the other side on numerous occasions. It was observed that within the Project period, participating public hospitals opened their internal risk management seminars to their private counterparts frequently, which were actually new practices outside the scope of the Project. Likewise, smaller hospitals had the chance to probe into the business model of larger partners through the social sharing environment framed by the Project.

The Project Working Group has organized numerous sessions of mutual visit plus

Knowledge Cafés between hospitals to facilitate social sharing. A picture taken in a Knowledge Café setting was shown in Figure 6.9.

Most participants reported that these events were highly valuable in the feedback questionnaires immediately distributed to them after each session. They often claimed that not only have they learnt from the other members of the Knowledge Café, but that they have better understanding of what they knew and what they believed about the subject being discussed. Participants of Knowledge Cafés also made new acquaintances with whom they could network in the future. It was also believed that if the Knowledge Café was run in-hospital it could then be the opening event of an internal "Community of Practice". In this case the Knowledge Café has been an across-hospital one so it also facilitated inter-hospital learning through knowledge sharing. However, the effectiveness of Knowledge Café also has its limitation. Below was a study on reflective dialogue written in first-person perspective by the author to illustrate the thinking of a participant with negative attitude.

As mentioned in Section 5.2.2, throughout the knowledge Café, 7 pieces of dialogue of 4 participants randomly selected in different tables were recorded, each of around 2 minutes. Of which, 2 main types of conversation had been observed. Three out of

four participants produced relatively constructive conversation that they were willing to share their thoughts and practices from their hospitals without observable hesitation. A typical conversation of such kind was recorded in Table 6.4. From the dialog, one could observe a pattern of stating one's own opinion and inquire for feedback. The process repeated and participants could learn from the meaningful context of discussion.

Figure 6.9 An Across-Hospitals Knowledge Café in One of the Participating Hospitals

However, one participant did show hesitation in sharing. She was named Cathy here but noted that this was not her real name. One of her conversation was recorded in Table 6.5. One could observe that she was willing to criticize the opinion of other people, but when her counterpart asked about her opinion, she attempted to avoid

sharing of practices in her hospital. In other words, participants were not able to learn from her.

Table 6.4 Dialogue between Mary & David

Dialogue 1
Mary: Yes this was also a common problem in our hospital
David: So did you have any solution to it?
Mary: We've try our best to educate our nurse, but there's not much improvement. We were thinking to enforce a policy
David: We've implemented similar policy before but it didn't solve the problem mainly because of resistance from doctors.
Mary: That sounds interesting. May you have a few more words on it?
David: Sure, in our case……

Table 6.5 Dialogue between Sunny & Cathy

Dialogue 2
Sunny: So how did such error occur in your hospital?
Cathy: No our hospital has a strict system in this matter. Staff committing such matter will be fired
Sunny: So it inhibit reporting
Cathy: No we have a strong system in identifying those who haven't reported
Sunny: That sounds great, could you share with me the methodology?
Cathy: I think it might not suitable for your hospital.

With such observation, I came to Cathy right after the knowledge Café and tried to

find out the barrier in sharing. The dialogue was then recorded in Appendix VII.

I started with an open question. I asked her about her feeling towards the Knowledge Café and she responded by a fairly general comment. I then proceeded and asked specifically on a scenario I have quoted in Table 6.5. The intent for me to ask such question was to test my hypothesis that she was not wiling to share. And she did not directly response to my question. At this point I frankly stated the problem I encountered and tried to persuade her to state her opinion. At this stage, she finally spoke what her opinion was. That was a really interesting idea to me actually. After learning so much from her, I knew that she was willing to share but there might be some barriers that inhibited her from speaking out in the Knowledge Café. Therefore I persuaded her to speak out the real sharing barriers she face.

She finally spoke out her concern. From her words, it seemed that her real concern was that she was not confident to share with other senior members in other hospitals. Actually, in the dialogue in Table 6.5, Sunny was a very senior member and that might be the reason why Cathy hesitated to share with him. Also, Cathy was a relative preservative person and she was very care about her and her hospital's face. Since in the event she represent her own hospital she was further suppressed to speak anything sensitive to her hospital. After understanding her concern I again tried to

coach her. Then I quoted an example and told her that even a hospital chief executive was willing to share in this event. I did this to comfort her and persuaded her to speak more openly in next event.

6.2.5 Observations of the Behavior in Community of Practice

One interesting thing to look at was the current role of an inter-hospital quality and safety community. The community of practice was composed of members mostly from the Project Working Group, including the author. The current group now has several attributes that differentiate it from a traditional Project team. First, it was demonstrated that members' voluntary contribution and personal benefits were valued; the group did not aim merely to get the project finished. This could be shown by the variety of topics observed in meetings. Members demonstrated very rich communication, both social and related to the project. Second, the community was formed around a shared vision and a passion concerning hospital quality and patient safety. This could be shown by their continuous collaboration and involvement in different projects. Third, the community has a strong sense of history and chronology. Members have shared memories of significant events and milestones during the past few years and have developed relations far beyond co-workers. This kind of sense of common history would not be found in a team. Forth, members in this community

establish their legitimacy through interaction about their practice, not through assigned tasks or formal roles which appear in other kinds of team. A typical event to illustrate this point was that opinions from inferior members (either from a small hospital or hold a junior position in hospital) in the community were adequately brought to discussion and implementation.

Most communities have a group of active participants, a group of people who listen but add little (so called lurkers), and a large group of members who only participate occasionally. Including the author, the community contained more than 50 members from 12 institutions, of which around 20 members were active core team members that were key knowledge contributors and possess deep influential power to influence the direction of the project and the future development of the project in the community. From the author's collaborative work with the community, it was observed that there were only very few members, if any, exercise take-only lurker policies. It was demonstrated in the active discussions in project meetings and knowledge cafés. It was also found that the community communicated by phone, email, conversation in social circumstances, and in regular meetings. Since community members were close to one another geographically and were all senior hospital practitioners, the professional meetings, conferences and seminars they join were fairly similar. Therefore there were numerous occasions that they could meet

one another and share their experiences.

Regarding the quantity of discussion inside the community, enormous amount of communication by phone was noted by the author in his active participating over the 2 years duration of the Project. Since there was no log on phone communication the knowledge exchange via this channel might be lost. Explicit communication was relatively little, and what there was mainly in the form of email and fax. The content was mostly project related information. The information was supplemented by verbal communication to create meaningful knowledge. Although each hospital had its own concern and information disclosure policies, the quality of discussion was consistently high since active core group members were all experienced and willing to contribute both time and knowledge, as well as some sensitive learning experiences from their own hospital.

7 DISCUSSION ON NEAR MISS REPORTING CULTURE AND BEHAVIOR

This Chapter presents the discussions from the findings in Chapter 6 from a few perspectives, including the factors that encourage and prohibit changes in hospital safety environment, and the necessary components in the building of an inter-hospital learning culture to facilitate a city-wide environment of healthcare safety.

7.1 Changes in Staff Reporting Attitude and Behavior

From the comparison of survey findings presented in Section 6.2, it was observed that the behavior of staff when they encountered Near Misses have changed during the Project period. This Section presents the implications of the changes, and provides some recommendations on the intervention needed so as to frame desirable individual and collective behavior regarding reporting and learning of Near Misses.

From the findings of the surveys, the overall willingness of healthcare professionals (doctors, nurses, and paramedical staff) to report Near Misses were similar to that of other staff (clerical and supporting staff) in hospitals. The phenomenon observed by

Lawton & Parker (2002) that healthcare professionals appeared reluctant to report adverse incidents seemed not applicable to Near Miss reporting. The willingness to voluntarily report was satisfactory. Some underlying reasons were addressed by several researchers, including mitigation of fear of retribution (Milligan, 2004), and the insignificant and non-negative nature of Near Miss reporting to individuals upon disclosure of the cases details (Barach and Small, 2000).

From Figure 6.3, one could observe that most respondents were more willing to report to senior and/ or to a hospital risk management committee in the given scenarios in the second survey than in the first survey, implying that most respondents had had a change in attitude on “what should be done” after the Project. However, given the espoused theory and theory-in-use suggested by Argyris and Schon (1978), one might argue that respondents might have acknowledged the reasons behind reporting therefore putting their “espoused” answers on the questionnaire, but it did not necessarily mean that they have adopted a new mode of reporting and new learning behavior. This argument appeared to be valid since 4 hospitals with relatively low reporting numbers also yielded improvement in the survey results as noted in Table 6.2. Besides, the first survey did not provide a clear forecast of the actual picture of report received upon implementation. One could note from Table 6.3 that the actual number of reports received varied significantly across

hospitals, and only 3 out of 7 hospitals (A, C, G) showed a satisfactory reporting rate, as reported by respective hospital management taking into account their hospital size and the maturity of their risk management system. Interestingly, the average staff willingness to report Near Misses of these 3 hospitals were not exceptionally high in the first survey. On the contrary, hospital F that produced the highest staff willingness to report Near Miss as stated in Table 6.2 showed a consistently low reporting number, which was a very contradictory result.

To investigate the validity of the argument, a number of conversations with managers and general staff in 3 participating hospitals were carried out. Questions were asked on “how often did you report Near Misses” and “how did you report Near Misses”. It was observed that the low reporting number was not the result of inadequate reporting behavior, rather it reflected the blockage of communication of Near Misses from the middle management layer to the hospital. In both surveys respondents expressed that they preferred reporting Near Misses directly to immediate superiors. The success of voluntary reporting of Near Misses relied on the specific attitude and role of department heads and middle managers. Verbal reporting practices have been nurtured over time; however general staff were still too busy to fill in forms. Most middle managers expressed that they had received more verbal reports on Near Misses in the Project period and had performed many improvement actions; however

they did not realize that they should transform that un-codified knowledge into papers for sharing with their colleagues in different disciplines. Since the risk management team/ committee/ department have no knowledge of the Near Misses, those Near Misses could only be solved in a narrower and low level arena, which might render them likely to happen again. In other words, the problem solving loop still stick to the smaller circle of first order problem solving (Tucker & Edmundson, 2003) as reviewed in Section 3.3.1. Worse, frontline staff might not continue to report since they find no feedback or changes from their reporting.

Given that the bottleneck of Near Miss sharing occurred in middle management, it was suggested that the next wave of cultural promotion effort should focus on middle managers/ department heads. It was also crucial to make it physically feasible for them to put down and share their known Near Miss experience. Very often hospital staff perceived that daily tasks were much more important than sharing knowledge. This was especially true in Hong Kong working environment since people usually have to work a lot of overtime to finish their assigned task. To deal with this, it was suggested that a hospital internal risk management knowledge community be created, and hospitals should assign adequate resources to support the community. For example, a company in the US named Allied Signal supports learning communities by giving staff time to attend community meetings, by funding community events,

creating community bulletins, and developing a directory of employee skills (McDermott, 2001). Community members who felt that they were core contributors could then opt to have a percentage of their time allocated to the community. This insured that the time they spent on Near Miss sharing and community activities would not conflict with their job task and were counted in their performance appraisal.

7.2 Transformation in Safety Culture

Organizational culture touches a wide discipline of subjects, which includes staff, organizational structures, management styles and beliefs, so on and so forth. Therefore to understand the actual changes in organization, it was suggested that further to the staff attitude and behavioral changes discussed in the previous Section, a more in-depth look into various other disciplines was required. This Section thus contains discussions on the transformation in safety culture. Furthermore, a paradox in learning from errors in the healthcare settings was discussed. As a possible intervention to the learning paradox, the potential of Near Misses being told as organizational stories was also addressed.

7.2.1 The Paradox in Learning from Errors in Healthcare Settings

Looking at the most direct attribute in evaluating the success in the promotion of Near Miss reporting culture, the hospitals with higher reporting numbers, which was illustrated in Table 6.3, had several attributes in common. The managers in these hospitals co-incidentally expressed that facilitating full Near Miss Management was important but not sufficient. From the knowledge viewpoint, Near Misses carried much more meaning than just information residing in databases. A member of staff encountering a Near Miss could have knowledge of the possible risk, contributing factors, solutions and preventive measures as well. However at the most fundamental level, such knowledge could only be volunteered (Snowden, 2000). Therefore, hospitals should focus on "creating the culture that favors continuous hospital-wide learning", so as to achieve the ultimate goal of hospital and patient safety.

The merit of Near Miss Management fits with the goal of organizational learning in the sense that it promotes continuous learning from errors. The goal of capturing Near Misses was to learn from small errors before they develop into tremendous harm, and the successful implementation of such a concept needs a whole organization approach. Therefore in contrast to adverse incident reporting, names and exact details in a Near Miss were not important. Rather the occurrence of such an

event in the error prone hospital environment was well worth noting for the sake of learning. Therefore, the main theme in the design of the Near Miss Report Form was to assist staff to report by simplifying the questions and lessening the demand on mental articulation of the potential reporter. This would lower the hurdles against voluntary reporting.

As numerous implementation concerns of Near Miss reporting in different hospital settings were addressed in the previous sections, the second step was to create a culture that favors hospitals to learn from their own errors. The components of safety culture that have been reviewed in Section 3.5 were favorable to organizational learning. As evaluated in Section 6.2.2, some hospitals did yield affirmative results in these cultures within the Project period. In reality, the successfulness in inducing changes depends mainly on the commitment of top management in the early stage, including resources allocation and creating an environment that provided incentives for their staff to learn and improve continuously. For example, Hospital A tried to impose both intrinsic and extrinsic motivation to its staff as shown in Table 5.1, while simultaneously creating a risk management framework learnt from its counterparts. Apart from promotion of reporting, some actions were accomplished to facilitate sharing. An executive from Hospital A expressed that the hospital realized knowledge sharing as a process of multiplying power. They tended to formalize the sharing of

Near Misses through implementation of several sharing sessions, and distributing memos and newsletters on lessons learnt in the early stage of the Project. Written matters such as memos, minutes and newsletters might be less interactive, but could have a wider reach and more long lasting effect. Since general staff were less involved in the early stage and might not adapt to a new mode of sharing, these written matters formed the backbone of initial knowledge dissemination, or say step 6 “dissemination to implementer” in the Incident Management Model reviewed in Table 3.1.

However not every single hospital was able to develop an organizational learning ability from Near Miss Management. Although in later stages bimonthly newsletters were widely distributed to staff in hospital B, D, E, and F, the report numbers in these hospitals still remained at a low level. In discussion with a few middle management staff from these hospitals, it was observed that the facilitation work in these hospitals was relatively weak at the beginning of the Project. Over time the passions of some early buy-in staff died down and it became more difficult for them to be engaged in the project. These hospitals thus failed to unfreeze their existing behavior.

While both successful and unsatisfactory internal cultural change efforts were observed in this Project, some hospitals that failed to unfreeze their culture shared

their difficulties in inducing changes. One of the biggest challenges they faced was probably balancing disciplinary action and learning. There was no doubt that policies and guidelines exist in vast amounts in hospital settings, especially in clinical care. Some hospitals required their staff to strictly follow the policies and guidelines, so as to maintain an absolute control over quality and safety. This situation was similar to other HROs. However, hospitals were commonly recognized as a more complex setting than other HROs in terms of labor intensiveness, human interaction, task variability, and workflow complexity. While creating room for learning from errors also implies increasing hospitals' management tolerance to errors, some managers found it unfeasible in implementation mainly due to risk concerns. It was even harder to achieve a no blame culture, since some errors did carry accountabilities.

Reason (1990) mentioned that no blame was neither desirable nor feasible, thus he suggested the idea of a 'just' blame culture. While root causes of incidents were recognized using the root cause analysis techniques, the Incident Decision Tree (IDT) was a useful tool that helps to determine follow-up on the human side. It was often a difficult choice to decide whether management needs to blame someone or impose disciplinary action in an incident. According to the UK National Patient Safety Agency (NPSA), the aim of IDT was to promote fair and consistent staff treatment within and between healthcare organizations. A generic IDT was attached in

Appendix VIII.

Another paradox in learning from medical errors arisen from the nature of the content being shared. Medical errors, or even Near Misses, were traditionally sensitive topics and could be very risky when disclosed or put into open sharing. Very often patients litigate hospitals and doctors for reckless conduct when they learned the errors might affect them. Besides, errors that were intended to be shared for learning purposes might be disclosed and amplified by public media to arouse public attention, which might in turn cause a devastating effect on the hospital's image and reputation. To reduce the occurrence of the situation, it was suggested that sharing of improvement actions and cases concerning medical errors should be done simultaneously so as to emphasize the importance of improvement and learning, and not simply sharing. This approach has demonstrated success in hospital A, as expressed by the management of the hospital and supported by the consistently satisfactory reporting rate, in facilitating continuous reporting and sharing without putting the hospital into the frying pan.

7.2.2 Near Miss and Storytelling

Often the changes that need to be implemented in large organizations were complicated, and have many dimensions and facets. Not all of them were fully

understood when the management embarks on the change process. Resistance was inevitable when a change was imposed (Denning, 2000), and Near Miss was no exception. The dilemma for managements in such situations was how to turn resistance into enthusiasm even when the rationales of the changes were not fully understood. Often the attempt to explain the idea could kill enthusiasm before it even begins implementation. This was demonstrated in the behavioral model and reporting impediments as stated in Section 3.3. Therefore, in reducing the organization and individual change anxiety discussed in Section 3.4.1, the storytelling methodology in organizational learning theories was of potential value in Near Miss Management.

Short et al. (1996) point out that incident reporting schemes themselves were a form of qualitative research. However, according to Rooksby et. al (2006), most practitioners were interested in the practical aspects of reporting and learning from reports, and thus a focus on the work of clinicians rather than that of their managers and administrators was desirable. They further added that medical practitioners understand incident reports, not as mirrors of what went wrong, but as constructions that make active sense in the practicalities of improving safety. This construction was a ‘story’, and thus a reporting scheme was for the telling and re-telling of stories to improve safety.

Steve Denning (2000) defines story as “something told or recounted in the form of a causally linked set of events; account; tale: the telling of a happening or connected series of happenings, whether true or fictitious”. In this sense, Near Misses shared in Knowledge Cafés and the online KMSS Solution Pool were typical examples of stories. Since it was observed that Near Misses shared in Knowledge Cafés did arouse participants’ interests to discuss lesson learnt, the communication of Near Misses as educational stories could be a possible way to nurture patient safety culture in hospitals. Moreover, Klein (1998) suggested that stories of such kind could be put to a variety of uses in an organization. These include:

(i) Communication through a naturally told story

(ii) Knowledge repositories were created

(iii) Breaking ice in meetings

(iv) Sharing values and beliefs

(v) Agents for change, motivation accomplishing goals, etc.

(vi) Training and lesson learnt programs

(vii) Scenario planning

(viii) Unfolding scenarios to guide decision making

The appeal of stories in organizations helped building descriptive capabilities, increasing organizational learning, conveying complex meaning, and communicating

common values and rule sets (Wiig, 2004). Storytelling has been found to be a particular way in which experts form and communicate information, for example engineers use stories to understand errors in complex equipment (Brown, 2000; Orr, 1986), information systems designers in healthcare use stories to discuss success and failure of systems (Stavri & Ash, 2003), and scientists in the Life Sciences use stories to communicate between themselves (Karasty et. al., 2002). In this sense, a Near Miss has the potential to be told as an organizational story so as to transfer knowledge concerning cause and effect, solution, and value of safety.

The storytelling methodology from the World Bank has demonstrated a very successful use of sharing stories as a tactic to facilitate organizational learning. The Information Solutions Network (ISN) of the World Bank with more than 1,000 workers was responsible for the delivery of enterprise technology systems, running the libraries and developing the intranet. Seth Kahan, coordinator of the ISN and M. Blair, an organizational consultant with a background in information technology, nurtured various thematic groups (communities of practices) through the practice of storytelling. In a typical meeting each participant was asked to share a story about an assignment or part of their work that aroused their interest, passion and curiosity. The approach generated very enthusiastic responses from ISN (Lee, 2005).

Given the popularity of storytelling, there was tendency to apply analytical thinking to collecting stories and condensing them into basic archetypes, which were sets of elemental forms or patterns of social behavior. Archetypes reflected from Near Miss might simply be used to trace hospital high-risk areas in parallel with classification statistics, which were of core importance to resolve risk and enhance quality in hospital settings.

7.3 Development of Inter-hospital Learning Culture

In Section 6.2.5, it was stated that the Project creates a desirable environment for inter-hospital learning in the sense that the Project aligned different hospitals to share both casually and formally, online and offline, and structurally and un-structurally. This Section probes into the sustainability and obligation of the current inter-hospital learning culture, investigates the organizational and social benefits in sharing Near Misses among hospitals, and suggests ways to further enhance the inter-hospital learning practices.

As stated in Section 4.2, the KMSS Solution Pool was the core technology that assists the sharing of de-identified cases and solutions among hospitals. De-identification was a process to remove all unique identifiers such as name of

patient and building. The process has been undertaken by many national reporting systems, including the Aviation Safety Reporting System (ASRS) reviewed in Section 3.2.2. However it was observed that the solution pool was not receiving adequate notice as observed from the page click rate data logged in the system database. A story modified from McDermott (2001) might give an illustration on the problem that a sole online solution pool might produce:

> *"When a major computer company first introduced an online sharing website, it asked field engineers to place their files in a common database. But, like many other companies, this company soon discovered that their staff only give minimal input to the database, and have no intention to hunt through the entries. As one engineer said, "My own file cabinet was bad enough, why would I want looking through everyone else's file cabinet" Rather than a resource, the company had created an information junkyard, full of potentially good material that was too much trouble to sort through. The field engineers wanted someone familiar with their discipline to assess the material, decide what was important and to enrich the documents in the database by summarizing, combining, contrasting, and integrating them …… Within a year the database was populated, but little used. Most people found the information to be too general to be useful."*

In the above circumstances, what people really needed was their peer's experience, which was the tacit knowledge concerning the thinking and logic of individuals. Although the story showed that the online solution pool has its limitations,

interestingly the sharing of individual experience was not halted and was mostly performed socially in the Knowledge Cafés and meetings in the Project, which was mentioned in Section 6.2.2.

However, it was also observed in the same Section that a Knowledge Café has its kind of inefficiency. For example, the expected achievement was much hindered due to the barriers identified in the conversation with Cathy. Although such kind of inter-hospital Knowledge Café was started some months ago, such kind of inter-hospital learning event was still in its infancy. The Knowledge Café only involved management staff in hospitals therefore the extent of reach was limited at this time. Also since such Knowledge Cafés were not held frequently (4 inter-hospital Knowledge Cafés in 2006), at this stage the practical value of the Knowledge Café was not totally liberated. However, the symbolic value of the Knowledge Café was important, since it pioneered causal inter-hospital sharing in Hong Kong.

Political concerns were another barrier to achieving smooth inter-hospital sharing. Even the Knowledge Café was held in a fairly informal manner, at least one participant still had reservations about revealing the errors made by their own hospitals. Interestingly, the participant had a very strong sense of representing their own hospital, so she carefully chose her words and avoided too much personal

opinion. Such a phenomenon inhibited free sharing and thus limited mutual learning.

The Project Working Group was derived from a group of passionate staff from different hospitals. The group of passionate staff could actually be seen as a knowledge community as discussed in Section 6.2.5. As a participant in the community, the author perceived that the community provides value at different levels. In the organizational aspect, since it was too costly for an individual hospital to afford quality programs that large hospitals/ Hospital Authority have made. Hospitals which gather together could pool resources to access expertise, learn from each other's experiences, develop common materials, assess the merit of different practices, and build a common baseline of knowledge. The value of such an inter-hospital community was also quoted by Wenger, McDermott & Synder (2002) using North Indiana TQM network as an example. Over the years, the community has accumulated a spectacular network that has spread to suppliers worldwide, healthcare institutions, insurance companies, government departments and numerous NGOs. Besides, the intellectual assets in the community including know-how, practices, and solution pools have been accumulated to certain extent.

The social value of the community was high and long-lasting because of its great influential power. There was increasing worldwide attention being paid to clinical

quality and patient safety. The work of the community could also help to increase social tolerance to unexpected community health risks e.g. SARS and Avian Flu. Since patient safety communities were fairly loose in Hong Kong, this community which consists of more influential members has the potential to evolve into a leading community inside the region. In discussion with some community members, it was found that people in the community benefit most by simply gaining knowledge that was directly applicable to their work in hospital. The reputation development process was also cited as an important benefit from participating in a community. It was also an effective way for organizations to handle unstructured problems and to share knowledge outside of the traditional structural boundaries. It helps preventing "reinvention of the wheel" by learning other hospitals' approach towards certain problems. In addition, long-term inter-hospital memory could be built and maintained, which collectively creates a solid foundation for the growth of the whole healthcare industry.

Since all team members were active and knowledgeable and met frequently, it was highly preferable to organize more face-to-face structured discussion. Apart from regular face-to-face meetings, as discussed above, the community members also work closely on certain inter-hospital projects. Therefore the milestones in these projects were seemingly forming the chronology of the community.

The community is, to some degree, said to be over-governed because of its controlled membership and dominating role of structured activities including regular project meetings. Controlled membership might restrict the injection of new ideas and growth of the community, while too many structured activities render the community institutionalized. However, it seemed that the current situation cannot be changed easily because the current community was formed around certain inter-hospital projects and only hospitals that were involved would allow their staff to participate. Since the community represents some degree of top management communication, the quality of members was also politically considered by each hospital. Therefore the pool that was suitable to participate in the community was inherently small.

Besides, one of the greatest limiting factors of a community's effectiveness was the time people have to participate. But the reality is, hospitals did not officially provide time for staff to voluntarily participate in knowledge communities. In the current inter-hospital community, if there was no on-going inter-hospital project, it was very hard to determine if each hospital would provide time for their staff to share and learn with other hospitals. Therefore structured activities and projects were essential in this stage for the sustaining of the knowledge community.

On the other hand, since nearly all discussion in the community remains

non-canonical, knowledge was neither stored nor transferred to a third party in most circumstances unless people recalled the memory through some triggers like case sharing. Regular knowledge audits were also not so effective in extracting the knowledge that resides in the heads of community members because most knowledge was case-based and will only be recalled when used. However, when considering recording their communication through explicit means like online forums, their attitude was not so keen, mainly because of the strict information disclosure policies in hospitals. This was also one very big barrier against implementing online forums and chatting. But still it was recommended to build the online forum and let participants post the content they think appropriate. It was believed that the community could organically find a comfort zone in the content of discussion once a platform was introduced.

8 CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE WORK

The learning from Project K – Miss Share, including lessons learnt from other risk management frameworks, experiences in promoting Near Miss reporting and subsequent follow up, intra- and inter-hospital learning behavior in participating hospitals, and some insight on improvement in hospital high risk areas are summarized. Throughout the Project a sharing pattern had evolved among participating hospitals, which acted as a solid foundation to sustain the merit of the Project. In conclusion, the key contributions and findings of this research project are as follows:

(i) "Accident (Patient/Visitor)", "Medication", and "Communication and Consent" were the top 3 common high risk areas in hospitals in Hong Kong. Good practices regarding the high risk areas were discussed and disseminated to all healthcare professionals inside the participating hospitals.

(ii) As shown in the first Staff Attitude Survey, hospital staff were generally willing to report Near Miss, however the lack of a reporting mechanism and

the feeling of unveiling others' fault hindered their expression. In the second survey, apparently fewer staff expressed that there were a lack of reporting mechanism (Figure 6.4), representing the successful establishment and penetration of the Near Miss reporting system.

(iii) The overall willingness of healthcare professionals (doctors, nurses, and paramedical staff) to report Near Misses were similar to that of other staff (clerical and supporting staff) in hospitals as noted in section 6.2.1.

(iv) As a whole, staff attitude and behavior towards Near Misses had improved as shown in the differences in responses to the scenario questions in the 2 Staff Attitude Surveys (Figure 6.3). However, the popularity of the central reporting mechanism was not adequate and staff tended to report to their supervisor rather than the established channels for Near Miss reporting.

(v) The differences in reporting behavior among hospitals is the outcome of several factors, including the inherited cultural differences of individual hospital, the varied degree of commitment of top management, and the deviation in promotion tactics.

Learning from adverse incidents is undoubtedly painful. Therefore learning from

Near Misses can be a good alternative and is proactive strategy in risk management to prevent adverse incidents from happening. It is a collective task for every hospital staff members, with leaders actively participating, facilitating and coaching. Moreover, the Project encourages a further step – to share Near Misses outside one's own organizational boundary so as to achieve mutual learning.

However to encourage organizational learning in the long run, Near Misses are just a starting point. It is recommended that the scope of sharing be progressively expanded, including both as regards sharing topics and the participants involved. Furthermore, the following items are suggested in continuation of this research.

(i) It is recommended that means that can assist continuous sharing and learning shall be explored. As stated in Section 7.1 and 7.3, currently most reporting and discussions inside and between hospitals still remain tacit, which inevitably limit the scope of sharing and learning. Techniques that may help to transform these materials into explicit knowledge while at the same time fulfilling their requirements in confidentiality is highly desirable. The record of stories and their subsequent distribution may provide a more effective way of sharing this kind of knowledge.

(ii) It is suggested that further probing into the behavior of the inter-hospital

knowledge community and studying the interventions that might be able to help to expand the number of staff that can participate to form a community of practice (CoP). If such CoP expands the message of patient safety in Hong Kong will be spread. Besides, the reaction of the healthcare industry to different interventions can be recorded for the reference of similar communities in other industrial sectors.

(iii) The rising level of safety management will increase the confidence and image of the health professional and the whole industry. A performance measurement system is suggested to be adopted by the hospital management to take into account the patient safety management and Near Miss reporting so as to raise the standards of patient caring.

The journey to a safety culture is a long one. While fortunately the Project K - Miss Share has aroused local concern for patient safety, the success of the forthcoming patient safety movement depends on the continuous effort from the healthcare industry, the government, and from society.

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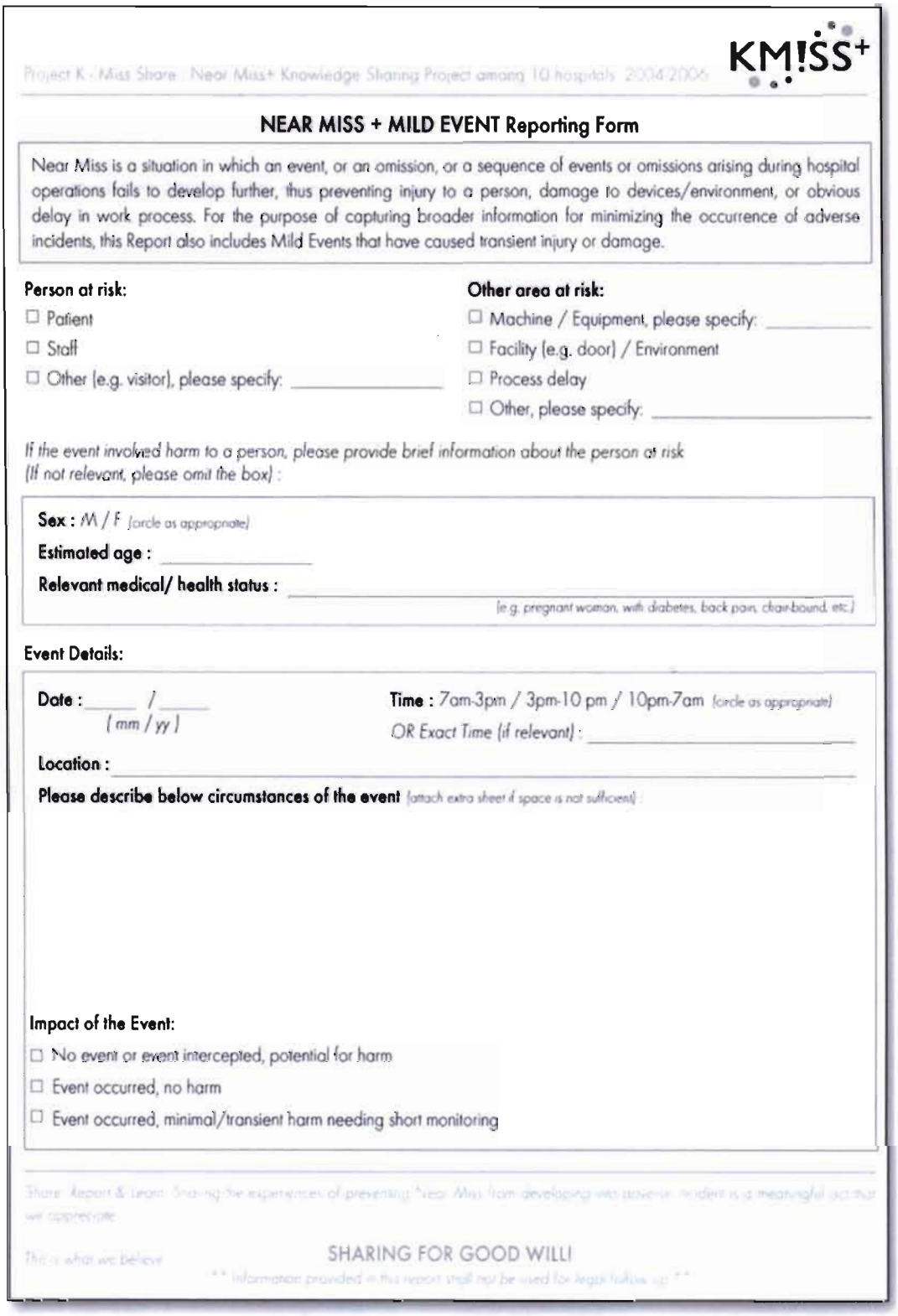
APPENDIX I – Near Miss Reporting Form



Project K - Miss Share : Near Miss+ Knowledge Sharing Project among 10 hospitals 2004/2006

KM!SS+

NEAR MISS + MILD EVENT Reporting Form

Near Miss is a situation in which an event, or an omission, or a sequence of events or omissions arising during hospital operations fails to develop further, thus preventing injury to a person, damage to devices/environment, or obvious delay in work process. For the purpose of capturing broader information for minimizing the occurrence of adverse incidents, this Report also includes Mild Events that have caused transient injury or damage.

Person at risk:

☐ Patient
☐ Staff
☐ Other (e.g. visitor), please specify: _____

Other area at risk:

☐ Machine / Equipment, please specify: _____
☐ Facility (e.g. door) / Environment
☐ Process delay
☐ Other, please specify: _____

If the event involved harm to a person, please provide brief information about the person at risk (If not relevant, please omit the box) :

Sex : M / F *(circle as appropriate)*

Estimated age : _____

Relevant medical/ health status : _____
(e.g. pregnant woman, with diabetes, back pain, chair-bound, etc.)

Event Details:

Date : ____ / ____ *(mm / yy)*

Time : 7am-3pm / 3pm-10 pm / 10pm-7am *(circle as appropriate)*
OR Exact Time (if relevant) : _____

Location : _____

Please describe below circumstances of the event *(attach extra sheet if space is not sufficient)*

Impact of the Event:

☐ No event or event intercepted, potential for harm
☐ Event occurred, no harm
☐ Event occurred, minimal/transient harm needing short monitoring

Share, Report & Learn: Sharing the experiences of preventing Near Miss from developing into adverse incident is a meaningful act that we appreciate.

This is what we believe

SHARING FOR GOOD WILL!

** Information provided in this report shall not be used for legal follow up **

Project K - Miss Share - Near Miss+ Knowledge Sharing Project among 10 hospitals 2004-2006

KM!SS+

Knowledge Sharing on the Event & Suggestion(s):

Do you know of any occurrence, or near-occurrence, of similar event?

☐ Yes ☐ No

Please indicate your perceived likelihood of happening of similar event :

☐ Almost certain (1x / month)	☐ Likely (1x / few months)	☐ Possible (1x / 1-2 year)	☐ Unlikely (1x / 2-5 years)	☐ Rare (1x / >5 years)

Please provide possible factors leading to the risk *(optional)* :

Suggestions/remedial actions to avoid recurrence of the event or lessons learned *(optional)* :

Position of Information Provider : ☐ Doctor ☐ Registered/ Enrolled Nurse ☐ Paramedical Staff ☐ Office / Clerical Staff ☐ Other Supporting Staff

Hospital : ______________________________

Thanks for providing the above information. The entry of the following contact details is optional, but useful for future follow-up, clarification and/or reward if applicable.

Details of Information Provider - mainly for contact purposes *(optional)* :

Name:	**Unit / Department:**
Contact no.:	**E-mail / Fax:**

Please pass this completed form to ________ , or collection box at ________ , or fax this report to ________ . Alternatively, you may report through the web at www........ or email to ________ , or call the Near Miss Hotline : _______ . For enquiry, please call _______ at _______

SHARING FOR GOOD WILL!

APPENDIX II – List of Activities of Project K – Miss Share

1. A Knowledge Sharing Seminar on 20 April, 2005 for 60 hospital executives inclusive of Hospital Chief Executives, Medical Superintendents, and senior government representatives as the first step to facilitate top executives buy-in of the concept of Near Miss+ reporting and sharing;

2. A Top Executives Commitment Ceremony on 20 April, 2005 among 10 Project hospitals as illustration of top executives alignment and commitment to the Project;

3. Two sessions of Training and Buy-in Seminars on 20-21 April, 2005 for 220 hospital middle management staff and professionals as the initial program to facilitate middle management buy-in;

4. A 2-day intensive Train-the-trainer program in June 2005 for 14 nominated professionals from 7 hospitals as the crucial supporting program to identify and train up competent staff to become facilitators in their respective hospitals;

5. More than 30 frontline training sessions in June-July 2005 for almost 3000 healthcare workers as a prompt and effective communication to frontline staff on the correct message of Near Miss+;

6. A 2-day Training Workshop on 8-9 December, 2005 on Root Cause Analysis for 170 professionals as a core program to promote in-depth understanding on Near Miss+ investigation techniques;

7. Three sessions of Cross Hospital Knowledge Sharing Café (mutual visits) in 2006 among Project hospitals as the unique and innovative method to facilitate inter-hospital learning;

8. A 1-day Project Conclusion/ Knowledge Sharing Conference on 5 July, 2006 for 140 healthcare professionals as an important event to disseminate lessons learnt from the Project to non-Project hospitals, healthcare providers and even some non-healthcare institutions.

9. Self-learning DVDs for over 80 hospitals and interested institutions worldwide as a sustainable and interesting means to broadcast the positive message of Near Miss+ Management and Sharing;

APPENDIX III – Taxonomy for the Classification of Clinical Near Misses

Patient Logistics	(01)	Absconder/ Walk away
	(02)	Discrepancy in transfer within hospital
	(03)	Discrepancy in admission/ discharge
	(04)	Failure to return from authorize leave
Accident (Patient/ Visitor)	(05)	Collision/ hit by object
	(06)	Door/ Room Facility Event
	(07)	Patient/ Visitor behavior
	(08)	Sharps
	(09)	Slip/ Fall
	(10)	Thermal
Blood Transfusion	(11)	Adverse transfusion reaction (minor)
	(12)	Blood bank (fail information)
	(13)	Discrepancy in request or sampling
Communication & Consent	(14)	Breach of confidentiality
	(15)	Consent not informed
	(16)	Discrepancy in verbal/ written/ typed message#
	(17)	Discrepancy in documentation/ filing#
	(18)	Missing/ wrong patient particular/ identification
Environment	(19)	Asset disappear
	(20)	Non-clinical facility failure
	(21)	Fire
	(22)	Improper storage/ delivery of good
	(23)	Abnormal temperature/ moisture
	(24)	Hygiene
Support Service	(25)	Discrepancy in food or water supply
	(26)	Food Contamination
	(27)	Discrepancy in cleansing/ waste management
	(28)	Charging/ payment issue
Infection Control	(29)	Improper sterilization/ Contamination (other than food)
	(30)	Minor infection
Information & Technology	(31)	Failure of clinical system
	(32)	Failture of non-clinical system
Investigation/	(33)	Discrepancy in consultation

Treatment	(34)	Discrepancy in diagnotic imaging
	(35)	Discrepancy in infusion
	(36)	Discrepancy in specimen extraction or handling
	(37)	Discrepancy in test/ test report
	(38)	Discrepancy in clinical treatment/ care
	(39)	Discrepancy in rehabilitation treatment
Clinical Devices &Consumables	(40)	Harm concerning Clinical Consumables
	(41)	Harm concerning non-precision tools & devices (clinical use)
	(42)	Harm concerning precision tools/ machinery
	(43)	Laser/ radiological/ corrosive harm
Medication	(44)	Discrepancy in prescription, dispensing or administration
	(45)	Discrepancy in drug history/ allergic info
	(46)	Improper handling/ storage
OSH (Staff)	(47)	Dangerous exposure/ contact
	(48)	Door/ Room Facility Event
	(49)	Injured whilst lifting/ carrying
	(50)	Sharps
	(51)	Slip/ fall
	(52)	Strike by object
	(53)	Thermal

Excluding particulars on patient identity and medications

APPENDIX IV (a) – Questionnaire on the First Staff Attitude Survey

Please ✓ the appropriate box

Position: ☐ Doctor
☐ RN/EN
☐ Allied Health
☐ Clerical
☐ Supporting

1. Before filling this questionnaire, have you heard of the term "Near Miss"?
   ☐ No (Jump to Q6)
   ☐ Yes

2. I have the term "Near Miss" ☐within half a year ☐within a year ☐more than a year ago

3. I have heard the term "Near Miss" from (channel)_____

4. Please tick below those you think are clinical Near Miss or Mild Event ? (Multiple ✓ is allowed)
   ☐ Staff/patient lose their wallet but was found by other person
   ☐ Staff prepare lunch for patient that are prohibited to eat, but patient aware and do not eat
   ☐ Specimen is lost for 10 days, leading to delay treatment
   ☐ Drug are wrongly administered to patient, but the error is intercept by matron
   ☐ Water leakage that lead to slippery floor in patient ward
   ☐ Patient slip down and lead to serious head injury

5. What do you think of the relationship between Near Miss and Adverse Incident ?
   ☐ Don't know
   ☐ They are similar
   ☐ No relationship
   ☐ Adverse incident can lead to Near Miss
   ☐ Near Miss can lead to adverse incident

Question No. 6-10 are possible scenarios in hospital. Please state your response to each scenario

6. (i) If you find that the floor of ward is slippery, you will： (Please ✓ one)

☐ I never encounter such situation (Please jump to Q7)

☐ No action

☐ I will try to tackle it by： (Please ✓ one)

☐ Solve by myself

☐ Inform colleagues/solve with others

☐ Report to senior (No matter you have solve it or not)

(ii) If a voluntary reporting system that aims to enhance hospital operation is set up, will you report the event in 6(i)？（Please circle the appropriate number）

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

7. (i) If you find that the drug administered is different form the prescription sheet, you will： (Please ✓ one)

☐ I never encounter such situation (Please jump to Q8)

☐ No action

☐ I will try to tackle it by： (Please ✓ one)

☐ Solve by myself

☐ Inform colleagues/solve with others

☐ Report to senior (No matter you have solve it or not)

(ii) If a voluntary reporting system that aims to enhance hospital operation is set up, will you report the event in 7(i)？（Please circle the appropriate number）

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

8. (i) If you find that there is a plastic substance in hospital lunch, you will： (Please ✓ one)

☐ I never encounter such situation (Please jump to Q9)

☐ No action

☐ I will try to tackle it by： (Please ✓ one)

☐ Solve by myself

☐ Inform colleagues/solve with others

☐ Report to senior (No matter you have solve it or not)

(ii) If a voluntary reporting system that aims to enhance hospital operation is set up, will you report the event in 8(i)？（Please circle the appropriate number）

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

9. (i) If you find that a clinical equipment is temporary fail for 30 seconds and then resume operation, you will： (Please ✓ one)

☐ I never encounter such situation (Please jump to Q10)

☐ No action

☐ I will try to tackle it by： (Please ✓ one)

☐ Solve by myself

☐ Inform colleagues/solve with others

☐ Report to senior (No matter you have solve it or not)

(ii) If a voluntary reporting system that aims to enhance hospital operation is set up, will you report the event in 9(i)？（Please circle the appropriate number）

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

10. (i) If you find that sundries are blocking fire escape route, you will： (Please ✓ one)

☐ I never encounter such situation (Please jump to Q11)

☐ No action

☐ I will try to tackle it by： (Please ✓ one)

☐ Solve by myself

☐ Inform colleagues/solve with others

☐ Report to senior (No matter you have solve it or not)

(ii) If a voluntary reporting system that aims to enhance hospital operation is set up, will you report the event in 10(i)？（Please circle the appropriate number）

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

11. When you report the above incidents, are you willing to put down your name and department？

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

(Absolutely no) （Very willing）

12. Which factor(s) below do you think will prohibit you from reporting the above incidents ? (Multiple ✓ is allowed)

- ☐ Inadequate training
- ☐ No suitable reporting mechanism
- ☐ Time consuming
- ☐ Feeling of unveiling other's fault
- ☐ Sense of being investigated
- ☐ Others：_____

13. Which factor(s) below do you think will encourage you from reporting the above incidents ? (Multiple ✓ is allowed)

- ☐ Put relevant topic in departmental meeting agenda
- ☐ Remind me of the reporting mechanism occasionally
- ☐ My report are treasured, and responses are given timely
- ☐ My reporting behavior will be appraised in staff appraisal
- ☐ Actual prize after reporting, such as small gift
- ☐ Others：_____

14. Which channel(s) below do you think will encourage you from reporting the above incidents ? (Multiple ✓ is allowed)

- ☐ Report to direct senior
- ☐ Report to risk management team in my hospital
- ☐ Report to inter-hospital risk management team
- ☐ Report to neutral institution
- ☐ Others：_____

15. Which method below will be handy for you to report the above incidents ? (Multiple ✓ is allowed)

- ☐ Filling hard-copy forms and put to collection box/fax
- ☐ Web-based reporting
- ☐ Phone reporting through voice recording
- ☐ Report the above Near Miss and mild incidents using the existing Adverse Incident Reporting Form
- ☐ Others：_____

APPENDIX IV (b) – Questionnaire on the Second Staff Attitude Survey

Please ✓ the appropriate box

Position: ☐ Doctor
☐ RN/EN
☐ Allied Health
☐ Clerical
☐ Supporting

1. Please tick below those you think are clinical Near Miss or Mild Event ? (Multiple ✓ is allowed)
   ☐ Staff/patient lose their wallet but was found by other person
   ☐ Staff prepare lunch for patient that are prohibited to eat, but patient aware and do not eat
   ☐ Specimen is lost for 10 days, leading to delay treatment
   ☐ Drug are wrongly administered to patient, but the error is intercept by matron
   ☐ Water leakage that lead to slippery floor in patient ward
   ☐ Patient slip down and lead to serious head injury

2. What do you think of the relationship between Near Miss and Adverse Incident ?
   ☐ Don't know
   ☐ They are similar
   ☐ No relationship
   ☐ Adverse incident can lead to Near Miss
   ☐ Near Miss can lead to adverse incident

Question No. 3-7 are possible scenarios in hospital. Please state your response to each scenario

3. (i) If you find that the floor of ward is slippery, you will： (Please ✓ one)
   ☐ I never encounter such situation (Please jump to Q7)
   ☐ No action
   ☐ I will try to tackle it by： (Please ✓ one)
      ☐ Solve by myself
      ☐ Inform colleagues/solve with others
      ☐ Report to senior (No matter you have solve it or not)

(ii) Based on existing Near Miss voluntary reporting system, will you report the event in 3(i)？
（Please circle the appropriate number）

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

4. (i) If you find that the drug administered is different form the prescription sheet, you will： (Please ✓ one)

☐ I never encounter such situation (Please jump to Q8)

☐ No action

☐ I will try to tackle it by： (Please ✓ one)

☐ Solve by myself

☐ Inform colleagues/solve with others

☐ Report to senior (No matter you have solve it or not)

(ii) Based on existing Near Miss voluntary reporting system, will you report the event in 4(i)？
（Please circle the appropriate number）

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

5. (i) If you find that there is a plastic substance in hospital lunch, you will： (Please ✓ one)

☐ I never encounter such situation (Please jump to Q9)

☐ No action

☐ I will try to tackle it by： (Please ✓ one)

☐ Solve by myself

☐ Inform colleagues/solve with others

☐ Report to senior (No matter you have solve it or not)

(ii) Based on existing Near Miss voluntary reporting system, will you report the event in 5(i)？
（Please circle the appropriate number）

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

6. (i) If you find that a clinical equipment is temporary fail for 30 seconds and then resume operation, you will： (Please ✓ one)

☐ I never encounter such situation (Please jump to Q10)

☐ No action

☐ I will try to tackle it by： (Please ✓ one)

☐ Solve by myself

☐ Inform colleagues/solve with others

☐ Report to senior (No matter you have solve it or not)

(ii) Based on existing Near Miss voluntary reporting system, will you report the event in 6(i)？
（Please circle the appropriate number）

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

7. (i) If you find that sundries are blocking fire escape route, you will： (Please ✓ one)

☐ I never encounter such situation (Please jump to Q11)

☐ No action

☐ I will try to tackle it by： (Please ✓ one)

☐ Solve by myself

☐ Inform colleagues/solve with others

☐ Report to senior (No matter you have solve it or not)

(ii) Based on existing Near Miss voluntary reporting system, will you report the event in 7(i)？
（Please circle the appropriate number）

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

8. When you report the above incidents, are you willing to put down your name and department？

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

(Absolutely no) （Very willing）

9. Have you filled a questionnaire similar to this one before？

☐ Yes ☐ No/Forgotten

10. In the previous year, how frequent do you hear the term “Near Miss” ?

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Never） （Always）

11. In the previous year, from where have you heard the term “Near Miss” ?

☐ Meetings / Seminars / Colleagues ☐ Promotion materials / newsletter

☐ Internal circulars / minutes ☐ Poster

☐ Near Miss DVD ☐ Others:_____

12. “The Project K – Miss Share have provide with me more insight in the reporting and management of Near Miss.” Your opinion to this statement is:

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Totally disagreed） （Totally agreed）

13. Have you report Near Miss in the previous year ?

☐ Yes ☐ No

14. Which factor(s) below do you think will prohibit you from reporting the above incidents ? (Multiple ✓ is allowed)

☐ No barrier

☐ Inadequate training

☐ No suitable reporting mechanism

☐ Time consuming

☐ Feeling of unveiling other’s fault

☐ Sense of being investigated

☐ Others：_____

15. “The Project K – Miss Share have increase my awareness to clinical Near Miss and adverse incidents.” Your opinion to this statement is:

1 ---------- 2 ---------- 3 ---------- 4 ---------- 5

（Totally disagreed） （Totally agreed）

16. Finally, what motivate you to report Near Miss?

_____

APPENDIX V – AHRQ Hospital Patient Safety Culture Survey

This questionnaire was designed to obtain our staffs' perceptions on the promulgation of a safety culture within the hospital. It is hoped that data generated from this survey can in the future serve as a guidance on directions to take when implementing hospital projects that aim at raising staff awareness in the area of nurturing the patient safety culture. To enhance the data collection process and, hopefully, project development, please answer the following items and ***return the completed questionnaires to the Management Office, on or before 29th July, 2006.***

We believe in quality improvement through teamwork. In this regard, your input and provision of valuable information is indeed indispensable from our endeavor in reconstructing a "safety-emphasized" yet therapeutic environment for the health of our patients and the general public.

May I take this opportunity to sincerely thank you for your kind co-operation!

Margaret Hong
General Manager

INSTRUCTIONS:
This survey asks for your opinions about patient safety issues, events (accident / incident /near missed) reporting in CMC and will take about 10 to 15 minutes to complete. Please mark your answer by filling in the circle.

A: Background variables

1. Your Working Dept/Unit:

O 1. M&G	O 7. AED	O 13. Physiotherapy
O 2.Surgical	O 8. Gynae	O 14. Occupational Therapy
O 3. O&T	O 9. Operating Theatre	O 15. Laboratory
O 4. Paed	O 10. OPD	O 16. Pharmacy
O 5. DDU	O 11. Anae	O 17. Hospital Administration
O 6. ICU	O 12. X-ray	O 18. Others, specify: _____

2. Your years of working experience in Canossa Hospital:

O 1. Less than 1 year	O3. 6 to 10 years	O5. 16 to 20 years
O 2. 1 to 5 years	O4. 11 to 15 years	O6. 21 years or more

3. Your rank:

O 1. Medical Superintendent/Associate Consultant/General Manager	O 4. ResidentMO
O 2. Matron/Ward Sister	O 5. RN/EN
O 3. Ward Aides	O 6. Others, specify_____

4. In your working unit, do you typically have direct interaction or contact with patients?
O 1. Yes O2. No

B: Frequency of events reporting

	Never	Rarely	Some-times	Most of the time	Always
1. When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?	①	②	③	④	⑤
2. When a mistake is made, but has no potential to harm the patient, how often is this reported?	①	②	③	④	⑤
3. When a mistake is made that could harm the patient, but does not, how often is this reported?	①	②	③	④	⑤

C: Number of events you have reported in the past 3 months

○ 1. None ○ 3. 3 to 5 ○5. 11 to 20
○ 2. 1 to 2 ○ 4. 6 to 10 ○6. 21 or more

D: Overall perceptions of safety

	Strongly Disagree ◀	Disagree	Neither	Agree	Strongly Agree
1. Patient safety is never sacrificed to get more work done	①	②	③	④	⑤
2.Our procedures and systems are good at preventing errors from happening	①	②	③	④	⑤
3. More serious mistakes don't happen here just because of chance	①	②	③	④	⑤
4. We have patient safety problems in this unit	①	②	③	④	⑤

E: Overall grade on patient safety in your working unit

Excellent	Very good	Acceptable	Poor	Failing
①	②	③	④	⑤

F : Safety Culture at unit level

	Strongly Disagree ◀	Disagree	Neither	Agree	Strongly Agree
1. My direct supervisor/manager appreciates good work when he/she sees a job done according to established patient safety procedures.	①	②	③	④	⑤
2. My direct supervisor/manager seriously considers staff suggestions for improving patient safety	①	②	③	④	⑤
3. Whenever pressure builds up, my direct supervisor/manager wants us to work faster, even if it means taking shortcuts	①	②	③	④	⑤
4. My direct supervisor/manager overlooks patient safety problems that happen over and over	①	②	③	④	⑤
5. We are actively doing things to improve patient safety.	①	②	③	④	⑤
6. Mistakes have led to positive changes here	①	②	③	④	⑤
7.After we make changes to improve patient safety, we evaluate their effectiveness	①	②	③	④	⑤
8. People support one another in this unit	①	②	③	④	⑤
9. When a lot of work needs to be done quickly, we work together as a team to get the work done	①	②	③	④	⑤
10. In this unit, people treat each other with respect	①	②	③	④	⑤
11. When one area in this unit gets really busy, others help out	①	②	③	④	⑤
12. Staff will freely speak up if they see something that may negatively affect patient care.	①	②	③	④	⑤
13. Staff feel free to question the decisions or actions of those with more authority	①	②	③	④	⑤
14. Staff are afraid to ask questions when something does not seem right	①	②	③	④	⑤
15. We are given feedback about changes put into place based on event reports	①	②	③	④	⑤
16. We are informed about errors that happen in this unit	①	②	③	④	⑤
17. In this unit, we discuss ways to prevent errors from happening again	①	②	③	④	⑤
18. Staff feel like their mistakes are held against them	①	②	③	④	⑤
19. Staff worry that mistakes they make are kept in their personnel file	①	②	③	④	⑤

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
20. When an event is reported, it feels like the person is being written up, not the problem	①	②	③	④	⑤
21. We have enough staff to handle the workload	①	②	③	④	⑤
22. Staff in this unit work longer hours than is best for patient care	①	②	③	④	⑤
23. We use more temporary staff than is best for patient care	①	②	③	④	⑤
24. We work in "crisis mode" trying to do too much, too quickly	①	②	③	④	⑤
25. Hospital management provides a work climate that promotes patient safety	①	②	③	④	⑤
26. The actions of hospital management show that patient safety is a top priority	①	②	③	④	⑤
27. Hospital management seems interested in patient safety only after an adverse event happens	①	②	③	④	⑤

G: Safety Culture at Hospital-wide level

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. There is good cooperation among hospital units that need to work together	①	②	③	④	⑤
2. Hospital units work well together to provide the best care for patients	①	②	③	④	⑤
3. Hospital units do not coordinate well with each other	①	②	③	④	⑤
4. It is often unpleasant to work with staff from other hospital units	①	②	③	④	⑤
5. Things don't go smooth when transferring patients from one unit to another	①	②	③	④	⑤
6. Important patient care information is often lost during shift changes	①	②	③	④	⑤
7. Problems often occur in the exchange of information across hospital units	①	②	③	④	⑤
8. Shift changes are problematic for patients in this hospital	①	②	③	④	⑤

H : Comments about patient safety, error, or event reporting in your hospital

THANK YOU FOR COMPLETING THIS SURVEY.

APPENDIX VI – Analysis Framework of AHRQ Survey

Adapted from http://www.ahrq.gov/qual/hospculture/hospdim.htm

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I. Background Variables

A. What is your primary work area or unit in this hospital?

h1. How long have you worked in this hospital?
h2. How long have you worked in your current hospital work area/unit?
h3. Typically, how many hours per week do you work in this hospital?
h4. What is your staff position in this hospital?
h5. In your staff position, do you typically have direct interaction or contact with patients?
h6. How long have you worked in your current specialty or profession?

II. Outcome Measures

A. Frequency of Event Reporting

d1. When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?
d2. When a mistake is made, but has no potential to harm the patient, how often is this reported?
d3. When a mistake is made that could harm the patient, but does not, how often is this reported?

Reliability of this dimension—Cronbach's alpha (3 items) = .84

B. Overall Perceptions of Safety

a15. Patient safety is never sacrificed to get more work done.
a18. Our procedures and systems are good at preventing errors from happening.
a10r. It is just by chance that more serious mistakes don't happen around here (reverse worded).
a17r. We have patient safety problems in this unit (reverse worded).

Reliability of this dimension—Cronbach's alpha (4 items) = .74

C. Patient Safety Grade

e1. Please give your work area/unit in this hospital an overall grade on patient safety.

Single-item measure-grades A through E as response categories.

D. Number of Events Reported

g1. In the past 12 months, how many event reports have you filled out and submitted?

Single-item measure-numeric response categories.

III. Safety Culture Dimensions (Unit level)

U1. Supervisor/manager expectations & actions promoting safety[1]

b1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures.
b2. My supervisor/manager seriously considers staff suggestions for improving patient safety.
b3r. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts (reverse worded).
b4r. My supervisor/manager overlooks patient safety problems that happen over and over (reverse worded).

Reliability of this dimension—Cronbach's alpha (4 items) = .75

U2. Organizational Learning-Continuous improvement

a6. We are actively doing things to improve patient safety.
a9. Mistakes have led to positive changes here.
a13. After we make changes to improve patient safety, we evaluate their effectiveness.

Reliability of this dimension—Cronbach's alpha (3 items) = .76

U3. Teamwork Within Hospital Units

a1. People support one another in this unit.
a3. When a lot of work needs to be done quickly, we work together as a team to get the work done.
a4. In this unit, people treat each other with respect.
a11. When one area in this unit gets really busy, others help out.

Reliability of this dimension—Cronbach's alpha (4 items) = .83

U4. Communication Openness

c2. Staff will freely speak up if they see something that may negatively affect patient care.
c4. Staff feel free to question the decisions or actions of those with more authority.
c6r. Staff are afraid to ask questions when something does not seem right (reverse worded).

Reliability of this dimension—Cronbach's alpha (3 items) = .72

U5. Feedback and Communication About Error

c1. We are given feedback about changes put into place based on event reports.
c3. We are informed about errors that happen in this unit.
c5. In this unit, we discuss ways to prevent errors from happening again.

Reliability of this dimension—Cronbach's alpha (3 items) = .78

U6. Nonpunitive Response To Error

a8r. Staff feel like their mistakes are held against them (reverse worded).
a12r. When an event is reported, it feels like the person is being written up, not the problem (reverse worded).
a16r. Staff worry that mistakes they make are kept in their personnel file (reverse worded).

Reliability of this dimension—Cronbach's alpha (3 items) = .79

U7. Staffing

a2. We have enough staff to handle the workload. A5r. Staff in this unit work longer hours than is best for patient care (reverse worded).
a7r. We use more agency/temporary staff than is best for patient care (reverse worded).
a14r. We work in "crisis mode," trying to do too much, too quickly (reverse worded).

Reliability of this dimension—Cronbach's alpha (4 items) = .63

H8. Hospital Management Support for Patient Safety

f1. Hospital management provides a work climate that promotes patient safety.
f8. The actions of hospital management show that patient safety is a top priority.
f9r. Hospital management seems interested in patient safety only after an adverse event happens (reverse worded).

Reliability of this dimension—Cronbach's alpha (3 items) = .83

IV. Safety Culture Dimensions (Hospital-wide)

H9. Teamwork Across Hospital Units

f4. There is good cooperation among hospital units that need to work together.
f10. Hospital units work well together to provide the best care for patients.
f2r. Hospital units do not coordinate well with each other (reverse worded).
f6r. It is often unpleasant to work with staff from other hospital units (reverse worded).

Reliability of this dimension—Cronbach's alpha (4 items) = .80

H10. Hospital Handoffs & Transitions

f3r. Things "fall between the cracks" when transferring patients from one unit to another (reverse worded).
f5r. Important patient care information is often lost during shift changes (reverse worded).
f7r. Problems often occur in the exchange of information across hospital units (reverse worded).
f11r. Shift changes are problematic for patients in this hospital (reverse worded).

Reliability of this dimension—Cronbach's alpha (4 items) = .80

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1. Adapted from Zohar (2000). A group-level model of safety climate: Testing the effect of group climate on microaccidents in manufacturing jobs. *Journal of Applied Psychology* 4(85):587-96.

APPENDIX VII – Dialogue between me and Cathy

My thought & feeling	What we said
I started with an open question	Me: Do you enjoy the discussion?
	Cathy: Well it is okay and I've learnt a lot. Or maybe you had better sent us the case for discussion earlier next time
I was testing my hypothesis that Cathy was not willing to share through inquiry	Me: Thanks for your opinion I'll do it next time. And I've heard that your hospital has a strong system in identifying those who haven't report, may I know more about it?
She did not answer my question	Cathy: Not really that strong and your hospital system is better than us. It's not worth for you
I state my problem and persuade her to share her opinion	Me: Thanks but my staff claims that the system put extra workload to them so I'm considering redesign it. Any suggestion in this matter?
I know you are not unwilling to share	Cathy: Then I think you may revise your policy and form a risk network…
I persuade her to speak out the real sharing barriers she face	Me: Good why not you speak it out in earlier discussion? It's a bright idea!
I finally know her real concerns	Cathy: I don't think my idea is bright enough to share in such inter-hospital event. And you know we are representing our hospital also so we should speak carefully
I coach her and try to reduce her mental barrier	Me: Some members have the same concern. But that's fine to share in such circumstances as you see that HCE is speaking something negative of his hospital. Actually you can do that with no hesitation

APPENDIX VIII – Incident Decision Tree