598 Management Report

A Review of the Incident Reporting Process for the Vancouver Island Health Authority

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EXECUTIVE SUMMARY

Objectives

The purpose of this 598 Management Report is to review and analyze the process for medical incident reporting in the Vancouver Island Health Authority (VIHA) and recommend changes to how information about incidents is collected and reported.

The purpose of collecting information about incidents is to understand what is required to prevent incidents from occurring, and ultimately to improve patient and staff safety. By understanding what types of incidents occur, and the administrative or system changes that might prevent such incidents, VIHA management can take appropriate action.

This management report examines the wide range of practices that are present in the health care field and will analyze the VIHA incident reporting form and database in order to identify specific changes that can be made to improve the incident reporting form and data storage tools.

The recommendations will allow VIHA to make better use of incident reporting information and will lead to enhanced patient and staff safety.

Summary of Method

There is an abundance of research that has been completed in the health care field about how health care providers have designed and operated incident reporting processes in an attempt to improve patient safety. This project relies heavily on the research that has been done elsewhere on how to improve mechanisms for incident reporting. The geographical scope of the sources of the literature review is wide; there has been research being conducted on incident reporting processes representing a wide variety of different practices around the world. Although the majority of the research on incident reporting processes has occurred in the United States, Canada, UK and Australia, research of successful practices has also included a review of reporting systems in Europe and Asia.

In addition to a literature review, this project will involve the use of individual and aggregated incident reporting form data that has been collected by VIHA. Identifiers for patients and staff have been removed from the incident records by VIHA before they were given to the primary researcher.

Results

The recommendations in this report are based on the research conducted through a literature review to seek out attributes of successful reporting systems
and through an analysis of 491 incident reports that were filled out by VIHA employees.

The literature review section of this report provides an indication of the common practices in the healthcare industry in incident reporting form and database design. The following is a set of commonly cited characteristics of successful incident reporting tools:

- A data reporting tool ensures ease of use, ability to incorporate reporting into current workflows and a comfort level within an organization.
- Electronic / web-based reporting will increase the quality of data collected and makes data entry easier for reporters.
- With the lack of a proven taxonomy for classifying medical incidents, strong consideration should be paid to implementing a simple classification system that is easy for reporters to use.
- Offering protection to reporters (providing an option to either submit anonymous or confidential reports) is key to ensuring that reporters feel safe in providing information that can be used to improve patient and staff safety.
- A method for tabulating data that facilitates further analysis to identify trends or common relationships between workplace factors and incident characteristics.
- Addressing barriers to incident reporting (the fear factor, the futility factor, and the hassle factor) is key to ensuring that potential reporters will submit incident reports.

The analysis of 491 incident reports submitted by VIHA employees indicates that several aspects of the form can be improved. The following is a list of areas of improvement:

- Although most forms had at least 75% of fields complete, there were a number of fields in the "Incident Type" set of fields that were not often used by reporters.
- There was a limited amount of information that provided an indication of the factors that led to incidents.
- The fields that were provided to managers to provide free-form information were not well utilized.

Based on the results of the literature review and the data analysis from the VIHA incident reporting forms, the following recommendations address the weaknesses of the current VIHA incident reporting form and database.
Recommendations

The following set of recommendations identify short-term to improvements to VIHA’s paper-based incident reporting form.

Short-Term Recommendations:

1. Consider removing infrequently used options in the incident “Type” classification system.
2. Ensure that a free-form field that seeks information about the factors that led to an incident is included in the incident reporting form.
3. Adjust the free-form fields provided to managers to improve the usefulness of the data.
4. Ensure that a tick box to track staff feedback is included on incident reporting forms.
5. Provide a classification scheme with corresponding check-boxes for reporters to indicate the factors that lead to incidents, in addition to a free-form field.
6. Design and implement a relational database that can aggregate incident reporting form data.

The following long-term recommendations will provide VIHA with direction on further adjustments that can be made to the incident reporting system to provide an enhanced ability to collect, store and analyze incident reporting form information.

Long-Term Recommendations:

7. Implement an electronic / web-based incident reporting form to increase the quality of data collected and to make data entry for reporters easier.
8. Ensure the Quality and Patient Safety Office has the resources to analyze incident reporting data, investigate potential safety improvement recommendations, and ensure accountability to implement workplace improvements.

The recommendations provided in this report provide VIHA with the ability to make effective changes to the incident reporting form and data aggregation tools, and will ultimately allow the organization to improve patient and staff safety by collecting better information about incidents and by providing an enhanced ability to summarize and make better use of the information.
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INTRODUCTION

Research Problem

Project Objective
The purpose of this 598 Management Report is to review and analyze the process for medical incident reporting in the Vancouver Island Health Authority (VIHA) and recommend changes to how information about incidents is collected and reported.

The purpose of collecting information about incidents is to understand what is required to prevent incidents from occurring, and ultimately to improve patient and staff safety. By understanding what types of incidents occur, and the administrative or system changes that might prevent such incidents, VIHA management can take appropriate action.

This management report will examine the wide range of practices that are present in the health care field and will analyze the VIHA incident reporting form and database in order to identify specific changes that can be made to improve the incident reporting form and data storage tools.

The recommendations will allow VIHA to make better use of incident reporting information and will lead to enhanced patient and staff safety.

Rationale
This project is important because VIHA recognizes that incident reporting is an opportunity for ongoing learning that can lead to improved outcomes for their clients. The process used by VIHA to improve patient and staff safety through the use of incident reporting data includes the identification, analysis and evaluation of incidents, and the formulation of recommendations to prevent future incidents from occurring.

One of the key components in the process is the use of an effective incident reporting mechanism for staff to use to communicate information about the causes and possible solutions to conditions that make incidents more likely to occur. Additionally, once information is collected it must be analysed to identify potential changes that can be made to the work environment that will improve patient and staff safety.

A review of the literature on medical errors reveals that there is a great deal of concern expressed by the public and medical professionals at the occurrence of
medical incidents and the corresponding harm that patients are exposed to. While it is disputed just how prevalent this problem is and the financial costs associated with medical incidents, it is recognised within the medical community that there is room for improvement within the health care sector.

Based on the data collected in the incident report forms, changes to the delivery of healthcare services can be made to improve patient safety. Research on the effectiveness of incident reporting suggests that a properly designed incident reporting system will improve patient safety, but that there are necessary design considerations that must be taken to ensure that a system is effective. This fact reflects the importance of the proper design of an incident reporting tool and database and supports this report’s assertion that understanding successful practices in incident reporting tool design is an important consideration.

Evidence of the effectiveness of incident reporting systems in improving staff and patient safety can be identified through descriptions of large, national incident reporting systems. For example, Runciman (2006) that describes the processes that are in place to ensure that health care workers learn from the information that is collected through the Advanced Incident Management System in Australia based on their occupational roles within an organization.

Further evidence of the effectiveness of incident reporting systems can be found with the National Reporting and Learning System in England and Wales. Through the data collected by this incident reporting system, initiatives to improve patient safety such as an effort to reduce errors in transfusion devices, medication administration and hand hygiene have been implemented (World Health Organization, 2005).

Examples of success with smaller incident reporting systems in the United States include the Joint Commission on Accreditation of Healthcare Organization’s development of a program to reduce medication incidents that was based on information collected through a reporting system, and the Institute for Safe Medication Practices’ improvement of drug naming and labelling process that was identified as a problem through a reporting system (Leape, 2002).

While it is clear that an incident reporting system has the potential to improve patient and staff safety, there are also many examples where incident reporting systems have not lived up to their potential and simply become tools to collect statistics (World Health Organization, 2005; Shojania, 2008).

The first step to ensuring that information is used to improve patient safety is to ensure that the right information is collected from reporters. There is more that can be done by VIHA to collect information on, analyze and report on incidents. With an understanding of current industry practices, improvements can be identified that will refine VIHA’s incident reporting mechanisms and will ultimately lead to improved patient and staff safety. This management report will
recommend improvements that should be made to VIHA’s incident reporting form and data storage tool.

Client Background

In British Columbia, The B.C. Ministry of Health works together with regional health authorities to deliver health care services to British Columbians. The boundaries of the health authorities reflect geographical features of the Province, as well as patient and physical referral patterns (Ministry of Health Services, n.d.).

The B.C. Ministry of Health, along with the Provincial Service Health Authority and the five regional health authorities ensure that health outcomes are achieved.

The following is a brief breakdown of the responsibilities of the Ministry of Health and the responsibilities of the health authorities and Provincial Health Authority:

Ministry of Health (Ministry of Health Services, n.d.)
- Establish expectations and outcomes for health authority performance
- Monitor and evaluating health authority performance
- Report to the public

Health Authorities (Ministry of Health Services, n.d.)
- Identify population health needs
- Plan programs and services
- Ensure programs and services are funded and managed
- Meet performance objectives

Provincial Health Authority (Ministry of Health Services, n.d.)
- Work with the health authorities to deliver provincial programs and specialized services
- Govern and manage the following organizations:
  - B.C. Cancer Agency
  - B.C. Centre for Disease Control
  - B.C. Children's Hospital & Sunny Hill Health Centre for Children
  - B.C. Provincial Renal Agency
  - B.C. Transplant Society
  - B.C. Women's Hospital & Health Centre
  - Forensic Psychiatric Services
  - P.H.S.A. Cardiac Services
  - Riverview Hospital

Vancouver Island Health Authority
VIHA is one of the five regional health authorities in British Columbia. The purpose of the health authorities in British Columbia is to deliver health care services to the public. VIHA serves a population of about 752,000 people over 56,000 square kilometres, which includes Vancouver Island, the Gulf and Discovery Islands. (Vancouver Island Health Authority Five-Year Strategic Plan, 2008)

VIHA delivers a wide variety of services. The range of services provided by VIHA include (Vancouver Island Health Authority Five-Year Strategic Plan, 2008):
- Population health
- Mental health and addiction services
- Primary health care
- Acute care and rehabilitation
- Home and community care and supports

Quality and Patient Safety Office

The client for this 598 Management Report is VIHA’s Quality and Patient Safety Office. The Office’s Patient Safety Leader, Heather Shon, directed the analysis and recommendation development.

The Quality and Patient Safety Office responsibilities include promoting “the highest quality of health care service and highest levels of patient safety throughout the Vancouver Island Health Authority.” (Vancouver Island Health Authority, 2008)

The Quality and Patient Safety Office’s goals are:
- Develop structures and processes that support multidisciplinary activity and clear accountability, including a system of measuring and reporting.
- Facilitate knowledge translation.
- Foster a culture of quality and safety in the organization.
- Identify priorities and opportunities for quality and patient safety, and focus the organization on them.
- Develop and nurture essential internal and external partnerships.
(Vancouver Island Health Authority, 2008)

Methodology

The purpose of this section is to describe the rationale for the chosen research strategy. This methodological description provides an outline of the information that was taken into consideration in the analysis as well as a critical evaluation of the conclusions and deliverables contained in this report.
There is an abundance of research that has been completed in the health care field about how health care providers have designed and operated incident reporting processes in an attempt to improve patient safety. This project relies heavily on the research that has been done elsewhere on how to improve mechanisms for incident reporting. The geographical scope of the sources of the literature review is wide; there research being conducted on incident reporting processes representing a wide variety of different practices around the world. Although the majority of the research on incident reporting processes has occurred in the United States, Canada, UK and Australia, research of successful practices has also included a review of reporting systems in Europe and Asia.

In addition to a literature review, this project will involve the use of individual and aggregated incident reporting form data that has been collected by VIHA. Identifiers for patients and staff have been removed from the incident records by VIHA before they were given to the primary researcher.

Research Tasks

1. Consult with project supervisor and client to clarify project deliverables
2. Conduct literature reviews based on important works that have been completed on incident reporting form design and data storage techniques thorough literature search
3. Analyse data from the Incident Reporting Forms and database based on the practices that were identified in the literature review
4. Draft preliminary findings and recommendations and provide for review with project supervisor and client for review and comment
5. Incorporate supervisor and client feedback
6. Draft deliverables
7. Complete deliverables

Methodology Discussion

The purpose of this methodology section is to discuss the benefits and drawbacks associated with the choices that were made during the research and analysis completed for this report.

This report used 491 incident reports from the West Coast General Hospital in the evaluation of the current VIHA incident reporting form. There are two main drawbacks associated with using these forms as the sole source of information to evaluate VIHA’s current incident reporting form.

First, the 491 incident reports represent a small sample from only one facility in VIHA. The aggregation of data that was used to examine how often each of the fields in the incident reporting form were used only represents how often the fields were used in this specific facility. It is not known if the West Coast General Hospital incident reporting forms were used more effectively in other units across
the organization. As a result, the recommendations that were drawn from the
analysis may not be as applicable to other units.

Although the set of 491 reports represents only one facility, the process of de-
identifying incident reporting forms in other units was not possible for the client to
complete. The process of de-identifying the incident reporting forms is very
labour intensive, and the resources required to de-identify sets of forms from
other work units was not available to the Quality and Patient Safety Office.

A second drawback associated with the 491 incident reporting forms used for this
report is that there were two different variations in the structure of the forms.
Incident reporting form examples are provided in Appendix 4. This became
problematic when the information was aggregated, because not all of the
information was comparable for all of the forms.

An older version of the form has a single free-form field that asked managers to
provide “Analysis and Evaluation of Incident”. The newer form also included
fields that prompted managers to provide free-form information in the following
fields “Recommendations and Implementation Plan” and “Administrative / System
Change Recommendations”.

This issue was addressed by attempting to determine from the older set of forms
if information was included that would fall under the categories included in the
newer forms. In some cases, even if the form did not include the
“Recommendations and Implementation Plan” and “Administrative / System
Change Recommendations” fields there was information recorded by the reporter
that was consistent with what information these fields were seeking.

Also, there is a variation on the free-form fields that reporters were prompted to
fill out. One variation of the form prompted reporters to fill the following three
fields:

• Describe the incident
• What factors contributed to the incident
• Improvement opportunity

The second variation of the form prompted reporters to fill in the following fields:

• What happened
• Current status / Action taken / Client condition
• Improvement opportunity

This issue was addressed by aggregating the information (whether there was a
response or not) only if the fields were included in the forms. As a result,
understanding what percentage of incident reports included information about the
causes of incident is limited because only a small number of forms had the field
“What factors contributed to the incident”. This drawback limits the ability to
understand how well the current reporting process can identify causal factors that lead to incidents.
CURRENT INDUSTRY PRACTICES FOR INCIDENT REPORTING

This section provides a summary of successful practices for incident reporting form and database design. These practices will be used to inform recommendations to improve VIHA’s incident reporting form and database.

Despite the lack of a standard set of practices used by health care providers, there are a number of basic design characteristics that should be considered by VIHA in redesigning the incident reporting form and database.

Data collection methods

There are various tools that can be used to collect information about medical incidents. Tools used to collect incident information include online forms, paper forms, telephone, and in-person reporting (Pace et al., 2003).

Some organizations use more than one reporting tool to offer flexibility for health care workers who work in different environments and who may be concerned with confidentiality (Beazley et al., 2004). However, each reporting system reviewed in the literature for this report included in their reporting methods at least one of the following reporting methods: paper reporting or electronic reporting through an online reporting tool.

There are benefits and drawbacks associated with each of the most commonly used incident reporting methods. Organizations that use more than one method of incident reporting can live with the weaknesses of one method because staff, if they wish, can choose the other method to submit report incidents.

*Paper-based methods of incident reporting*

Many healthcare organizations have paper-based methods of incident reporting that require that staff enter incident information onto paper forms, that are then collected and reviewed. Databases can be created to allow clerical staff to enter information into an electronic format for aggregation and further analysis. Based on this information, leaders in healthcare organizations can identify workplace issues that can be changed to improve patient and staff safety.

There are various drawbacks associated with paper-based incident reporting forms (Avery, 2005; Cobb, 2004; Poniatowski et al., 2005; Steen et al., 2008; White, 2007):

- Legibility of handwritten information
- Time spent sending paper forms between individuals according to business rules, time spent with paper sitting on desks
• Opportunities for misdirection of forms as they are passed from one person to another
• Loss of confidentiality if forms are stored in the wrong place
• Lack of ability to view and respond to aggregated data and suggestions for system improvement in a timely manner

Because of these drawbacks, electronic systems have been considered to be more effective than paper-based reporting methods (White, 2007).

**Electronic methods of incident reporting**

Electronic systems for collecting incident information have the potential to avoid some of the drawbacks associated with paper-based incident reporting systems. The potential benefits that can be realized through web-based incident reporting systems include (Avery, 2005; Cameron Inquiry, 2009; Cobb, 2004; Wu et al., 2002):

• The simplification of reporting for frontline staff
• The elimination of numerous paper forms that must be filled out and sent to various sources
• The quality of data collected can be increased
• Response time to information submitted can be reduced because reports can be quickly generated and reviewed by leaders in the organization

In describing the electronic system that was designed for the Dartmouth-Hitchcock Medical Centre, Avery (2005) explains how the user interface for the web-based incident reporting system allows for users to enter data using drop down boxes to select standardized information about incidents. Once all of the information about the incident is entered, a screen that displays all of the information is presented to reporters to review before it is submitted to the database.

Web-based systems also allow for timely use of data collected by an incident reporting system (Joshi, 2002). Web-based systems can be designed so that information, as soon as it is entered by a reporter can instantaneously be aggregated with an existing data set using pre-determined queries as well as having options for health care providers to design custom queries to summarize information based on user needs. This feature allows for safety concerns to be identified and addressed quickly compared to a paper-based system, where forms have to be collected and entered into a database in order to be analysed.

Although electronic, web-based systems for collecting incident information have proven to be useful for some organizations, electronic incident reporting systems are not inherently more effective than paper-based incident reporting systems. There are also some advantages that paper-based reporting systems can have over electronic-based reporting systems. The SAFE reporting tool described by
Harris et al. (2007) is a 5 inch by 8 inch card that is used to collect incident reporting information. It was found that reporting rates for the SAFE card system were higher in comparison to the reporting rates for the web-based system being used by the organization. It was hypothesized that it was the paper-based system’s ease of use that made it popular amongst some reporters in addition to the opportunity to avoid difficult log-in and operation procedures.

It has been noted that the design of many electronic reporting systems can be deeply flawed and may compromise the confidentiality of the reporting process. User testing must be done to identify these potential problems. One example of a design flaw that compromised the willingness of users to use a system was an online system that displayed a large logo on the screen when a user logged in to submit a report. Confidentiality of a user could be compromised if a co-worker walked by when the user was logging in. (White, 2007)

Additionally, the use of electronic reporting systems in some work environments can be problematic if the system requires training. In describing the transition between a paper-based incident reporting system to a web-based system, Steen (2008) found that with the relatively high turnover rate in staff who enter incident reporting information means that ongoing staff training is required to make sure that staff are able to log on and use the system.

One strategy that can be used to address the strengths and drawbacks of paper-based and electronic-based incident reporting systems is to provide both options for incident reporting. Multiple formats can be offered because of the comfort level some individuals may have in using paper forms, as well as the diverse work environments that medical professionals work in that may make using a web-based tool difficult. (White, 2007)

Although using electronic incident reporting systems offers potential for immediate feedback and potentially avoids cumbersome procedures to manage paper forms (Makhjian, 2004), the most important factor in designing an incident reporting tool is to ensure that the reporting method fits into the workflow of the medical professionals who are responsible for submitting the reports (Beazley, 2004).

Beazley (2004) states that:

> If reporting requires steps to be taken that do not fit naturally into existing work patterns, then, no matter how well the interface is designed, how easy to access, or how simple it is to complete, people may not report.

The concept of determining the best fit for a reporting mechanism requires background into the culture of an organization and the relationships between professional groups that are responsible for using the system. Getting support from clinicians in the design and implementation of a new system can be very
useful to help work towards a successful rollout of a new mechanism (Karsh et. al., 2007).

The implications for this discussion is that there is no inherent benefit to either electronic or paper based incident reporting mechanisms, although web-based data collection techniques increase the quality of data collected. Important considerations include the ease of use, ability to incorporate reporting into current workflows and the comfort level within an organization to using a particular method.

**Successful incident reporting design characteristics:**

1. A data reporting tool that ensures ease of use, ability to incorporate reporting into current workflows, and fits within the comfort level of an organization.
2. Electronic / web-based reporting will increase the quality of data collected and makes data entry easier.

**Classification systems for incident reporting data**

Collecting incident reports is of little value if the data cannot be used to identify trends between the causes of incidents and the potential changes in the workplace that can be made to prevent incidents. Classification is the first step towards achieving this purpose. (World Health Organization, 2005)

When an incident is reported, a classification scheme allows for that incident to be collated with incidents of a similar type. Should this information be aggregated, common problems can be identified from a data set that helps identify the factors that lead to incidents (Dekker, 2003; Grant, 2007; Holden & Karsh, 2007; Hutchinson et al., 2009; Kostopoulou, 2007). Without an effective way to classify incidents, the information collected by a reporting system may not be easily used for identifying possible system improvements. (Boxwala et al., 2004; Tighe et al., 2004)

For example, if an error occurs with the connection of an oxygen tube to an intravenous line, this event could be classified as a “tubing mix-up”. Over time, if many “tubing mix-up” incidents are reported, it might lead analysts to identify the need to ensure that tubing mix-ups are prevented by identifying the factors that commonly lead to tubing mix-ups. Classification of incidents leads to safety solutions that can be generalized and applied in different settings. (World Health Organization, 2005) Classification schemes for medical incidents are referred to as “taxonomies” in medical literature.
Ideally, taxonomies can be generalized across different medical settings but are specific enough to provide useful information to a particular unit within an organization. Sometimes, this need for classification contrasts with the benefits of providing free-form descriptions of incident information (White, 2007). Ideally, incident reporting systems collect information through a taxonomy to allow for aggregation and also allows users to report free-form information to provide further details that are not captured through the taxonomy. Free-form information is valuable because it allows for a review of the incident beyond the information that relates to the classification scheme (Dekker, 2003).

A review of the literature reveals that there are many different types of taxonomies have been used by health care organizations to classify and organize medical incident data. Well established, published taxonomies tend to be specific to a small branch of medicine or are broadly based on industrial safety literature (Pace et al., 2004; Runciman et al., 1998). Additionally, there is no consensus as to what an ideal taxonomy looks like or should be comprised of (Holden & Karsh 2007; Pace et al., 2004).

Depending on the type of incident reporting, the following types of information are commonly collected based on a combination of free-form information and tick box selection of options based on a taxonomy (Boxwala et al., 2004; Chang et al., 2004; Clarke, 2006; Hoffman, 2008; Miltch et al., 2006; Pierson et al., 2007; Rowin et al., 2008; Zhang et al., 2004)

a. Time and site of occurrence  
b. Role of patient or staff  
c. Description of the incident  
d. Factors that led to the incident  
e. The severity of the incident

Generally, there are three different (but not totally mutually exclusive) types of taxonomies:

1. Multilevel classification systems that capture information about a number of domains (including the factors that led to the incident, the level of harm, location, people involved and preventability)
2. Classification systems that identify latent and active causes  
3. Classification systems that address cognitive psychological processes that are based on theoretical causes of human factors

Appendix 5 will present examples of various taxonomies that have been used by health care organizations or have been recommended by researchers based on a theoretical model of how errors occur. The benefits and drawbacks of each of these classification methods will be discussed.

While there are benefits and drawbacks with each type of taxonomy, it is possible that the type of taxonomy is not as important as the ease of use of the taxonomy and the reporting system’s ability to capture basic incident information for further
analysis (Haller et al., 2007; Shojania, 2008; Vincent, 2007).

According to Shojania (2008), incident reporting systems must be easy to use and must not overwhelm users by requiring a great level of detail. A complicated taxonomy only serves to make it less likely for health care workers to submit reports. The “goal of classification lies in triaging the need for further investigation”, and that collecting this basic level of information requires very little input from reporters (Shojania, 2008). Receiving detailed information is not as important as ensuring the information is actually collected.

The assertion that the classification of incidents is not as important as receiving information about incidents is supported by Vincent (2007) who states that while having users provide a rough classification is useful, the real meaning in incident reports comes in the free-form narrative information that is provided by reporters. Making real sense of incidents requires interpretation by experts who know the workplace who can identify human factors and organizational factors that have led to the incident (Clarke, 2006; Hoffman, 2008; Holzmueller et al., 2004; Olsen et al., 2007; Pronovost, 2004; Vincent, 2007).

While it is unclear whether an easy-to-use taxonomy that leads to a simplified reporting process is more useful than a comprehensive taxonomy based on a theoretical model that explains human and organization behaviour (Holden & Karsh, 2007), strong consideration should be paid to implementing a simple classification system that captures basic information until a proven taxonomy has been developed, tested and validated in numerous health care settings.

**Successful incident reporting design characteristic:** With the lack of a proven taxonomy for classifying medical incidents, strong consideration should be paid to implementing a simple classification system that is easy for reporters to use.

**Confidentiality/Anonymity in incident reporting**

Medical service providers commonly feel that their reputations, careers or exposure to legal action is a risk that is associated with reporting a medical incident. Confidentiality or anonymity is an attribute that is necessary to ensure that potential reporters feel safe when reporting incidents. Without some type protection, it is likely that reporting rates for medical incidents will suffer. (Ashcroft & Cooke, 2006; Fernald et al., 2004; Grant & Larsen, 2007; Holden & Karsh, 2007; Snijders et al., 2009; Tighe et al., 2005; World Health Organization, 2005)
Although it is recognized that protection for reporters is necessary, there is no consensus about whether a system should be completely anonymous or confidential. There are benefits and drawbacks associated with each option.

Anonymous reporting processes provide potential reporters with the ability to report without the possibility of being personally linked to the incident and the personal blame that may come along with it (Schuerer et al., 2006). Taylor et al. (2007) suggest that anonymous reporting systems have a higher rate of reporting compared to confidential incident reporting systems. The downside to anonymous reporting is that it removes the potential for reporters to be asked further questions to supplement the information that was recorded by the incident reporting system. This may limit the potential to learn from incidents that are reported on. (Holden & Karsh, 2007)

Confidential reporting systems provide the possibility of follow-up questions to the reporter of the incident in order to supplement the information that is reported through the reporting system in order to learn more about incidents. (Milch et al., 2004) A downside associated with confidential reporting is that there will be some users that may be able to view data in a manner where it could be possible to tie incidents with reporters. This opens up the possibility, or the perception that it is possible, that individuals will be punished as a result of submitting an incident report (Ashcroft & Cooke, 2006). This potential will prevent some health care workers from submitting incident reports.

A second potential downside to confidential paper-based systems is that there must be established rules for managing, copying and sharing incident report forms that contain personal information. Tighe et al. (2006) describe a process with an incident reporting system being used in a hospital unit as a system, that in theory, is designed to be confidential. But based on a poorly designed set of business rules for managing the incident report forms, the reporter names were left exposed and the reports left in binders for all staff to see. Reporters communicated that they didn’t feel safe in using the system because other staff were able to see their reports.

Despite the drawbacks associated with confidential reports, there is evidence that suggests that confidential systems can collect information that is filled out with more complete information than completely anonymous incident reporting systems. In a study that examined the differences between the quality of data collected by confidential systems versus the quality of the data collected through an anonymous system, Fernald et al. (2004) found that data collected through the confidential program was much more likely to contain data can be used to improve patient safety, even before follow-up interview data is added to the confidential reports.

There is no consensus on whether anonymous or confidential systems are more appropriate for incident reporting. However, one possibility for addressing this
issue to encourage reporters to include personal information with the promise that it will be kept confidential, but if the potential reporter does not feel safe including such information then a report can be submitted anonymously.

An option that has been used by the aviation industry in the United States is to collect identifying information in order to conduct follow-up interviews, and then remove the identifying information before the rest of the report information is entered into a database for further analysis. The National Safety Reporting System (2009) has collected 715,000 reports and has never had an incident where a person has been identified after submitting an incident report.

When an incident is reported to the National Safety Reporting System, two different analysts with experience in the aviation industry read the report to identify factors that must be addressed to prevent further incidents. Once a preliminary analysis is conducted on the report, the information contained in the report is included in a database, and at this point the information that could be used to identify the reporter is removed and is not entered into the database that is used for policy development and human factors analysis. The portion of the reporting form that contains personal information is physically removed from the form, date stamped and sent to the reporter as a receipt to show that the incident report was received (2009).

Ensuring that the information used to improve safety and ensuring that there is no mechanism for the database to collect personal identification are key incentives that the National Safety Reporting System provides to reporters to report incidents. Using this method to allow for the potential to collect follow-up information without having a mechanism for recording information about reporters ensures that there is no potential at any point in the future to associate an incident report with a reporter.

**Successful incident reporting design characteristic:** Offering protection to reporters (providing an option to submit anonymous or confidential reports) while ensuring that information cannot tie a reporter to an incident at some point in the future is key to ensuring that reporters feel safe providing information that can be used to improve patient and staff safety.

**Incident Reporting Information Tabulation and Analysis**

To realize the potential of incident reports that are collected by an organization, it is necessary to have a mechanism to aggregate the information submitted by reporters. Using aggregated information, it is possible to identify common problems and possible solutions to improve patient and staff safety. (Benn et al., 2007; Braithwaite et al., 2004; Clarke, 2006; Cooke et al., 2004; Grzybicki et al., 2005; Page et al., 2003; Schuerer et al., 2006).
With electronic tabulations it is possible to have timely analysis of information that is collected (Olsen et al., 2007). Without an electronic method to collect and report on incident reporting data, individual paper-based forms can be used to identify solutions to very specific issues but there is very limited ability to identify trends across work units or organizations.

Most incident reporting system databases use relational database technology to store incident information based on the taxonomy used in the incident reporting process (Johnson, 2003). It is important to ensure that people that specialize in software design are involved in the process of developing a database and that user feedback is incorporated into the database design, as it is common when human factors specialists build relational databases that important user considerations are not adequately addressed in the database design (Johnson, 2003; Tepfers, 2007).

There are some key features that an incident reporting database should offer (Runciman, 2006), including:

- The ability to share information while protecting reporter and patient confidentiality
- Patient safety information must be able to be aggregated based on predetermined criteria and also provide options to answer user-driven queries
- The ability to track comparisons between units and monitor trends over time.

With the right design characteristics, an incident reporting database should collect and store the information that makes it possible to retrieve and summarize information that in turn can be used to identify improvements, while still maintaining reporter confidentiality (Cobb, 2004; Grzybicki et al., 2005; Harris et al., 2004; National Safety Reporting System, 2009; Pace et al, 2003; Runciman, 2006).

**Successful incident reporting design characteristics:**

1. Having a method for aggregating data that facilitates further analysis to identify trends or common relationships between workplace factors and incident characteristics.
2. Database design must protect information that could identify reporters.
Addressing Barriers To Incident Reporting

It is widely recognised that there is a need for health care providers to have a system in place to keep track of and learn from incidents. (Braithwaite et al., 2004; Holden & Karsh, 2007) Despite this consensus, there are a number of barriers that exist that can block an attempt to implement an effective incident reporting system that is actively used by health care providers to improve safety.

There are three main barriers to successful incident reporting: the fear factor, the futility factor, and the hassle factor (Ashcroft & Cooke, 2006; Cooke et al., 2004; Khare, 2005).

**The fear factor: punishment associated with being involved in an incident or reporting an incident**

Staff will be less likely to report incidents if they feel that there is the possibility they will be personally blamed for the incident and that they might suffer professionally once the incident has been exposed.

For an incident reporting system to function properly and for medical staff to be forthcoming, an organization must resist using punitive actions of placing blame on individual people and instead look to system problems that may have led to the incident. A “name, shame, and blame” culture that exists in some organizations leads to underreporting and a loss of valuable information that can be used to improve patient safety. (Walsh & Greenall, 2007)

Once information about an incident has been entered into a database by a reporter, either information that could be used to identify the reporter should not be recorded, or there must be business rules established so that no personally identifiable information will be made available to other co-workers or patients. (Beazley, 2004) Additionally, a reporting system must be discrete. Reporters must be able to maintain confidentiality or anonymity.

**The futility factor: perception that information is not being used for system improvement**

Feedback to reporters has an impact on the participation in incident reporting systems. (Haines et al., 2008; Pontiatowski et al., 2005) If health care providers do not think that the time they take to fill out a report has the potential to make a difference in how work is conducted, the exercise of reporting an incident may seem like a waste for time, especially for “near misses” where an adverse event does not occur.

To address this barrier, it is essential to ensure that staff responsible for reporting understand how the information can make a difference for the delivery of healthcare services.
The key to addressing this barrier is not only to actively use the incident reporting data to improve patient safety but to also communicate the fact that the data is used to improve patient safety. If health care providers know that the time they spend to submit report makes a difference for patients and co-workers, heath care workers will be more likely to feel that taking the time to submit reports will be justified (Benn et al., 2007).

**The hassle factor: rejection of bureaucracy, managerial scrutiny**

Some medical staff view incident reporting as “red-tape”, “admin” or “management”. (Waring, 2004) This perception is exasperated if the reporting process is onerous or does not fit into their work routines. It is much more likely that incidents, and incident reporting, are more likely to happen during busy periods and the reporting process during these times must be easy to do. (Karsh et al., 2005)

For some people this means having an electronic system to capture information, and for others this may mean having paper forms handy for data collection (Harris et al., 2007; Karsh et. al, 2005). As Karsh et al. (2005) have noted, perhaps the most notable barrier to achieving the design of a successful incident reporting system is the fact that some systems are not easy for reporters to use and may be seen as simply being a “long tedious form to be filled out” (Khare, 2005) that doesn't lead to any improvement in the workplace. This factor, in combination with the other barriers, leads to medical service providers not making the time to enter incident reports into an incident reporting system.

There are a number of ways that incident reporting could be perceived as a hassle by medical service providers. First, if the taxonomy that is used by an incident reporting system is too complicated and hard to apply to a particular situation, this can be a source of frustration for someone who is trying to accurately report an incident (Chang et al., 2005).

Second, the reporting process for health care providers must fit into the work routines and be suitable to the work environment. Without this proper fit, a system may fail to improve patient safety. (Beazley, 2005; Tepfers et al., 2007)

Designing an incident reporting system must take into consideration that users must find it easy to use the system. Otherwise, the quality and frequency of reporting will suffer.

**Successful incident reporting design characteristic:** Addressing barriers to incident reporting (the fear factor, the futility factor, and the hassle factor) is key to ensuring that potential reporters will submit incident reports, and this consideration must be made when designing an incident reporting tool.
Summary

Below is a summary of successful incident reporting form and database design characteristics. Based on this summary and the analysis of VIHA’s incident reporting form presented in the next section, a set of recommendations will be made to improve VIHA’s incident reporting form and database.

1. A data reporting tool that ensures ease of use, ability to incorporate reporting into current workflows, and fits within the comfort level of an organization.
2. Electronic / web-based reporting will increase the quality of data collected and makes data entry for reporters easier.
3. With the lack of a proven taxonomy for classifying medical incidents, strong consideration should be paid to implementing a simple classification system that is easy for reporters to use.
4. Offering protection to reporters (providing an option to either submit anonymous or confidential reports) is key to ensuring that reporters feel safe providing information that can be used to improve patient and staff safety.
5. Having a method for tabulating data that facilitates further analysis to identify trends or common relationships between workplace factors and incident characteristics.
6. The database design must include protect information that could identify reporters.
7. Addressing barriers to incident reporting (the fear factor, the futility factor, and the hassle factor) is key to ensuring that potential reporters will submit incident reports, and this consideration must be made when designing an incident reporting tool.
VIHA INCIDENT REPORTING: Description and Analysis

This section will discuss the reporting form that VIHA uses to record incident information and will analyse the usefulness of the current incident reporting form and incident reporting database based on the wide range of industry practices described in the previous section.

Description of VIHA Current Incident Reporting Form and Database

All errors, whether they result in harm to patients or staff, are to be reported according to VIHA’s incident reporting policy. The formal definition of an incident “includes an adverse event, hazard, near miss or unusual occurrence.” (VIHA Incident Reporting Policy, 2008) According to policy, staff may include their personal details on the incident report or may chose to report anonymously.

VIHA’s incident reporting is achieved by having staff who wish to report an incident fill out a paper form. The paper form has two sides, one side is filled out by the reporter and the other side is filled out by a manager/delegate. Incident reporting form examples are provided in Appendix 4.

The side that is filled out by the reporter includes the following components:

- Identification (name/date/site/time of incident, etc.)
- Type (tick box of various types of incidents)
- Risk (rating, 1-5)
- Narrative (free form information describing the incident, factors that contributed and improvements opportunities)
- Notification (listing of who was notified)

In identifying the “Type” of incident that occurred, reporters are required to select only one selection from the following options:

<table>
<thead>
<tr>
<th>Heading</th>
<th>Selection Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication</td>
<td>- Administration</td>
</tr>
<tr>
<td></td>
<td>- Prescribing</td>
</tr>
<tr>
<td></td>
<td>- Preparation/Dispensing</td>
</tr>
<tr>
<td></td>
<td>- Transcription/Clerical</td>
</tr>
<tr>
<td></td>
<td>- Adverse Drug Reaction</td>
</tr>
<tr>
<td></td>
<td>- Quality and Storage</td>
</tr>
<tr>
<td></td>
<td>- Monitoring</td>
</tr>
<tr>
<td></td>
<td>- Other</td>
</tr>
<tr>
<td>Accidents</td>
<td>- Fall</td>
</tr>
<tr>
<td></td>
<td>- Handling/Positioning/Transfer</td>
</tr>
</tbody>
</table>
In addition to identifying an incident “Type”, in order to provide an appropriate response it is necessary to provide a risk assessment for each incident. The risk rating for each incident determines what action is taken and by whom. The following chart is used by VIHA to classify risk:

<table>
<thead>
<tr>
<th>Category</th>
<th>Types</th>
</tr>
</thead>
</table>
| Behaviour             | • Verbal/Physical Aggression  
                       | • Self Harm  
                       | • Suicide  
                       | • Other  |
| Clinical Presence     | • Elopement < 5 hours  
                       | • Elopement > 5 hours  
                       | • Abduction  
                       | • Other  |
| Clinical Management   | • Treatment/Procedure  
                       | • Client Identification  
                       | • Assessment  
                       | • Client Access/Flow  
                       | • Diagnosis  
                       | • Test  
                       | • Other  |
| Communication / Documentation | • Communication  
                       | • Confidentiality  
                       | • Results/Reports  
                       | • Health Records  
                       | • Consent  
                       | • Other  |
| Infection Control     | • ARO Screening Omitted  
                       | • Nosocomial Infection  
                       | • Handling  
                       | • Placement  
                       | • Non-compliance  
                       | • Other  |
| Infrastructure        | • Inadequate Design/Space  
                       | • Failure/Malfunction  
                       | • Damaged  
                       | • Other  |
| Resources             | • Staff  
                       | • User Error  
                       | • Failure/Malfunction  
                       | • Lack of Availability  
                       | • Inappropriate for the Task  
                       | • Unclean/Unsterile  
                       | • Theft/Missing  
                       | • Other  |
| Services              | • Food Service  
                       | • Housekeeping  
                       | • Laundry  
                       | • Security  
                       | • Transportation  
                       | • Other  |
Risk Assessment Chart (VIHA Incident Reporting Policy, 2008)

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>No harm, damage or loss. Possible Near Miss.</td>
</tr>
<tr>
<td>Level 2</td>
<td>Mild/temporary harm, damage or loss. Requires initial, but not prolonged intervention.</td>
</tr>
<tr>
<td>Level 3</td>
<td>Moderate/temporary harm, damage or loss. Requires short-term intense intervention.</td>
</tr>
<tr>
<td>Level 4</td>
<td>Major harm, damage or loss. Requires intense intervention to sustain life. Possible Adverse Event.</td>
</tr>
<tr>
<td>Level 5</td>
<td>Severe/permanent harm, damage or loss. Requires prolonged intervention to sustain life. Possible death or destruction. Possible Adverse Event.</td>
</tr>
</tbody>
</table>

In the free-form narrative fields that are provided to reporters on the incident reporting forms used for this report, there are a couple variations provided to reporters. One variation of the form prompted reporters to fill the following three fields:

- Describe the incident
- What factors contributed to the incident
- Improvement opportunity

The second variation of the form prompted reporters to fill in the following fields:

- What happened
- Current status / Action taken / Client condition
- Improvement opportunity

Also, for the 491 incident reporting forms used for this report, there are a couple variations of how the manager/delegate portion of the forms were designed. An older version of the form has a single free-form field that asked manager/delegates “Analysis and Evaluation of Incident”. The newer form also included fields that prompted manager/delegates to provide free-form information in the following fields “Recommendations and Implementation Plan” and “Administrative / System Change Recommendations”.

Where these variations have a consequence for the analysis it will be noted in the relevant section.

In addition to the options that are provided to reporters on the front of the VIHA incident reporting form, there are instructions on the back of the form that provide information about the “Risk” and “Type” sections of the form. The information
about the “Risk” categories gives a definition for each and provides a couple of examples of an incident in each of the levels. The back of the form also provide examples of sample incidents for each of the incident “Type” fields.

Once the manager/delegate completes the incident reporting form, one of the two copies is kept by the manager, and the second one is to be sent to the Quality and Patient Safety Office at VIHA. Further details about VIHA’s incident reporting process are described by the “VIHA Incident Reporting Policy” that is included at the end of this report in Appendix 3.

All incident reporting forms are sent to the Quality and Patient Safety Office and information that is in the form is entered into the database by an employee in the office. The database used to store the data is a Microsoft Access database that is only used by a single operator who is responsible for taking the paper-based information and entering it into the database. There is a limited amount of information that is currently being entered into the database, and includes:
- Date
- Time
- Program/site
- Person affected
- Type
- Risk

Based on the information entered into the database, the Quality and Patient Safety Office provides periodic reporting on the summary level data retrieved from the database. Examples of the reporting that has been provided from database data can be found in Appendix 6.

Analysis of VIHA Incident Reporting Data: West Coast General Hospital

This section will examine usefulness of the components included in the current VIHA incident reporting form based on data collected through 491 incident reports from the West Coast General Hospital.

The analysis will identify the aspects of the current incident reporting form that provide useful information and will identify aspects of the form that should be improved. The following issues will be addressed:

1. A review of the most commonly reported incident attributes at the West Coast General Hospital
2. A review of which fields were used by reporters and which fields were not used by reporters
3. Whether there was improvement-related and causative information contained in the incident reports
4. Whether there was follow-up communication with people who reported incidents
5. A summary of recommendations to improve the VIHA incident reporting form and incident reporting process

Throughout the discussion of each of these issues, recommendations will be provided and then summarized at the end of the section.

1. A review of the most commonly reported incident attributes at the West Coast General Hospital

The most commonly reported types of incidents reported on the 491 VIHA incident reporting forms used at the West Coast General Hospital include:

- Falls or slips (26% of reports)
- Administration of medication (21% of reports)
- Preparation of medication (7% of reports)
- Verbal aggression (5% of reports)
- Physical aggression (4% of reports)

Based on the type of incident that occurred, respondents and their managers were prompted on the incident reporting form to recommend improvements that would prevent future incidents from occurring. The most common types of recommended workplace improvements include:

- Improvements regarding the administration or prescription of medication (29.6% of suggested improvements).
- Availability or use of equipment (11.1% of suggested improvements).
- Communication with staff or patients (7.0% of suggested improvements).
- Improvement on the handling or flow of patients (6.7% of suggested improvements)

This summary is an example of the type of information that can be obtained from the current incident reporting form. In order to determine where improvements can be made to the form, a closer look at the details that were collected must be completed. The remainder of this section and will look closely at which fields in the form were used properly, which fields were not used, and the quality of the information that was collected that could lead to improvements in patient and staff safety at VIHA.

Based the examination of the use of the incident reporting form and the quality of the data, recommendations will be provided to improve the data collected through the incident reporting form.
2. A review of which fields were used by reporters and which fields were not used by reporters

% of reports containing data for every data field

The information that was taken from the incident reporting forms indicates that not all of the fields were used by reporters when filling out incident reports. Understanding whether reporters made use of the fields can provide an indication of where improvements need to be made to the incident reporting form. Designing fields that will be used by reporters will allow VIHA to collect more complete information about incidents, and as a result will be more likely to contain information that will lead to improved patient and staff safety outcomes.

The table below provides an indication of the number and percentage of incident reporting forms that had different levels of completion by reporters:

<table>
<thead>
<tr>
<th>% of fields in the incident reporting forms from the West Coast General Hospital</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reports that had 70% - 74.99% of fields filled out</td>
<td>27</td>
<td>5.5%</td>
</tr>
<tr>
<td>Reports that had 75% - 79.99% of fields filled out</td>
<td>159</td>
<td>32.4%</td>
</tr>
<tr>
<td>Reports that had 80% - 84.99% of fields filled out</td>
<td>196</td>
<td>39.9%</td>
</tr>
<tr>
<td>Reports that had 85% - 89.99% of fields filled out</td>
<td>24</td>
<td>4.9%</td>
</tr>
<tr>
<td>Reports that had 90% - 95% of fields filled out</td>
<td>53</td>
<td>10.8%</td>
</tr>
<tr>
<td>Reports that had 100% of fields filled out</td>
<td>32</td>
<td>6.5%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>491</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

This overall figure indicates that many of the forms had more than 80% of the fields filled in. In order to recommend improvements to specific areas of the form it will be necessary to determine which individual fields were not used appropriately by reporters. There was a wide variation in the completion rates of some fields compared to others, and the following discussion will focus on the use of specific fields.

Report on completion of incident reporting form fields

One way to determine which fields have been used effectively is to identify which fields were often left blank by reporters.

There were several fields in the incident reporting form that were used in almost every report from the West Coast General Hospital that was used in the analysis. Those fields include:

- All of the fields in the “Identification” section of the form; and
- The “Risk” rating field.
The only exception to this is the “MRN/PHN or client ID number”, as this field was used in 77.2% of the reports. This field is not relevant for all of the reports, as this would only apply if an incident involved a client. Some of the reports involved staff members, so using the “MRN/PHN or client ID number” field would not be necessary. For incident reports that did involve a patient and where a patient number should have been recorded, a patient number was recorded 86.4% of the time.

For each of the incident “Type” fields, there is a wide variation in usage of each option that was presented to reporters. Below is a discussion of the level of usage of the sections of the “Type” fields on the incident reporting form. Detailed tables that display each response option can be found in Appendix 7.

<table>
<thead>
<tr>
<th>Reporter use of “Incident Type” field</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication</td>
<td>35.2%</td>
</tr>
<tr>
<td>Accidents</td>
<td>28.5%</td>
</tr>
<tr>
<td>Clinical Management</td>
<td>10.0%</td>
</tr>
<tr>
<td>Behaviour</td>
<td>10.0%</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>4.7%</td>
</tr>
<tr>
<td>Communication / Documentation</td>
<td>3.3%</td>
</tr>
<tr>
<td>Services</td>
<td>1.8%</td>
</tr>
<tr>
<td>Clinical Presence</td>
<td>1.6%</td>
</tr>
<tr>
<td>Resources</td>
<td>1.6%</td>
</tr>
<tr>
<td>Infection Control</td>
<td>1.0%</td>
</tr>
<tr>
<td>No Incident Type Selected</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Factors contributing to the incident and improvement opportunity

In addition to understanding which fields were used by health care workers who reported incidents, it is also necessary to have an assessment of how well reporters have identified:

1. the factors that have led to incidents; and
2. the opportunities to improve the work environment to prevent further incidents.

For many of the incident reporting forms used in this analysis, a variation of the form was used that did not include the free-form field that sought out information from reporters about what they saw as the factors that led to the incident. Of the 491 reports used for this report, only 51 (10.4%) of them contained the field that asked “What factors contributed to the incident (if known)”.
Of the 51 reports that did include this field, 18 of them (32.7%) contained information about what reporters believed were the factors that led to the incident. Although there was only about a third of the reports that had this field that also contained information in this field, the field heading does indicate that this field should be filled out only if the factors that lead to the incident are known.

Manager/Delegate fields: “Analysis and Evaluation of Incident”, “Recommendations and Implementation Plan”, and “Administrative / System Change Recommendations”

Page 2 of the VIHA incident reporting form is dedicated to the manager/delegate who is responsible for following up on each incident reporting form that is submitted. Each manager/delegate is responsible for providing follow-up analysis, adding any details about the incident that was not included by the original reporter and providing advice about how to prevent further incidents from occurring.

There are two variations of the manager/delegate set of fields on the 491 incident reporting forms that were used for this report. One variation included three free-form boxes with the following headings:

- “Analysis and Evaluation of Incident”
- “Recommendations and Implementation Plan”
- “Administrative / System Change Recommendations”

The second variation of incident reporting form that was used for this report had a single, large free-form field with the heading “Administrative / System Change Recommendations”.

For the purposes of analysis, the forms that had the single, large field instead of the three fields were read and evidence for types of information that matched the three boxes from the first incident reporting form variation was sought out and recorded. As a result, for each reporting form regardless of the variation of the form, data was recorded to indicate if the manager/delegate provided information that related to each of the three fields described in the first variation.

Below is an indication of how each of the three sections of the form were used by reporters:

<table>
<thead>
<tr>
<th>Reporter use of “Manager/Delegate” fields</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis and Evaluation of Incident</td>
<td>27.1%</td>
</tr>
<tr>
<td>Recommendations and Implementation Plan</td>
<td>25.1%</td>
</tr>
<tr>
<td>Administrative / System Change</td>
<td>10.0%</td>
</tr>
</tbody>
</table>
### Recommendations

<table>
<thead>
<tr>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reports that had all three Manager / Delegate fields used</td>
<td>10.0%</td>
</tr>
<tr>
<td>Reports that did not have any of the Manager / Delegate fields used</td>
<td>72.3%</td>
</tr>
</tbody>
</table>

In many cases information was provided about how future incidents could be avoided as indicated by the fact that 28.7% of reports had one or more fields filled in by manager/delegates. However, there was limited information that looked holistically at the workplace to identify recommendations that could be described as system related changes and in the second field there was little information that specifically aimed at an “implementation plan”.

### 3. Follow-up communication with people who reported incidents

A key component of an incident reporting system is to have a feedback mechanism for individuals who provide incident reports. Getting feedback on incident reports from a manager or supervisor not only provides reporters with an opportunity to learn about the incident and how future incidents can be prevented, but the feedback also gives an indication to health care workers that providing incident reports has an impact on patient safety in the workplace. Without the feedback that indicates that incident reports are addressed and used by managers and supervisors to improve the workplace, the process of filling out an incident report can seem like a burden or a waste of time to front-line healthcare workers (Khare, 2005).

Given the importance of ensuring that reporters receive feedback, for some of the VIHA incident report forms a box has been provided to have managers/supervisors to track whether they have given feedback to the person who has provided the report.

For many of the 491 incident reports used in this report from the West Coast General Hospital, the box for managers/supervisors to check to indicate if they provided to reporters was not present. Below is a chart that indicates the number of incident reporting forms indicated that reporters were provided with feedback:

<table>
<thead>
<tr>
<th>Incident Reporting Forms that indicated reporters were given feedback on the report</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # that indicated feedback was given</td>
<td>47</td>
<td>9.6%</td>
</tr>
<tr>
<td>Total # that indicated feedback was not given</td>
<td>9</td>
<td>1.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>Tick box was present on form, but not checked</td>
<td>8</td>
<td>1.6%</td>
</tr>
<tr>
<td>Tick box was not present in the incident report</td>
<td>427</td>
<td>87.0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>491</td>
<td>100%</td>
</tr>
</tbody>
</table>

While it is clear that for the reports submitted with the tick box present that many of the reporters did receive feedback, it is crucial to continue to ensure that reporters continue to receive feedback (Haines et al., 2008; Norton et al., 2004; Pontiatowski et al., 2005).

4. Improvement-related causative information contained in the incident reports

Can the information collected in the report identify a causal link between work environment factors and the occurrence of incidents?

There are a couple of challenges in determining a causal link between workplace factors and the occurrence of incidents based on the incident reporting forms used for this report. First, as discussed in the introduction to this section, not all of the forms had a free-form field that prompted reporters to indicate the factors that lead to the incident. Only 51 of the 491 reports used for this report included this field. Of the 51 reports that included this field, 18 of them (35.2%) contained information about the factors that led to the incident being reported.

Second, even if all of the incident reports contained this field, the type of response that is solicited from reporters is free-form text. In order to be able to identify common workplace factors that lead to incidents it is necessary to either have the information manually classified or to have reporters select an option from a classification scheme in addition to the free-form text. The information collected in the form that prompts users to identify workplace factors can be used to observe factors that lead to a specific incident, but without an ability to aggregate data and identify trends or common themes in a large data set, the potential to identify factors that lead to incidents is limited.

The information collected in the 491 incident reporting forms does not allow for timely analysis of the types of incidents that occur and the factors in the work environment that have led to the incidents.

The data collected with the current incident reporting form includes a classification of the “Type” of incident, but a classification scheme is not present for the identification of the factors that have led to the incident. There is a free-form field that is included in some incident reporting forms to describe the factors that led to each incident. This free form description could be manually coded by
an analyst, and this coding would make it possible to examine relationships between workplace factors and incidents that occur. This process of manual coding of qualitative descriptions from free-form text would be costly and labour intensive. This would prevent a timely analysis of the information collected which in turn would impede the implementation of potential workplace improvements.

Do the recommendations or suggestions to prevent future incidents appear appropriate and practical?

With the information provided by reporters and manager/delegates who have provided follow-up information, 57.8% of the incident reports used for this report contained recommendations or suggestions to prevent further incidents from occurring. As discussed earlier, common recommended types of workplace improvements include:

- Improvements around the administration or prescription of medication;
- Availability or use of equipment;
- Communication with staff or patients; and
- Improvement in the handling or flow of patients.

Some recommendations were brief and perhaps on their own not helpful (such as a recommendation that stated VIHA “should get rid of computer MARS”, (MARS is a medication administration records system), but in general many of the suggested improvements were directly related to the event and could be considered appropriate and practical.

Examples of appropriate and practical recommendations that were made include:

- ER physicians should not be scheduling appointments, this should be done by staff who are responsible for scheduling
- Front desk can be confusing at times, give written instructions instead of verbal instructions
- Have medications individually packaged by pharmacy to prevent mistakes
- Work with Stores Department continues to be a big problem, should work with Stores and consider labelling of shelves, check at least 2 times a week

In addition to the suggestions for workplace improvements that can be useful on an individual basis, additional value can be taken from the suggestions by identifying themes in the suggestions for workplace improvements when the reports are aggregated within an organization or work unit in an electronic database. For example, there were many suggestions made to improve the ability to prescribe and manage medications for patients.
Other examples of themes that can be identified in the workplace improvement recommendations based on aggregated data include:

- The need to be able to design patient flows, patient management
- The need to have appropriate equipment available to ensure that staff can effectively perform their duties
- The use of bed alarms to prevent falls
- The need to ensure appropriate staffing levels
- The need to ensure that appropriate policies are in place

Suggestions for workplace improvements can be considered useful to deal with incidents on a case-by-case basis as well as being useful when aggregated to identify themes that VIHA can focus on to improve patient safety.

**Does the information focus on system changes?**

The workplace improvements suggested by reporters and managers/delegates in the 491 incident reports can be useful to deal with specific incidents, but most of the suggestions did not contain observations or insight into possible system/administrative changes that could not only prevent similar incidents, but also prevent other potential hazards that share a common root cause.

Although the data collected in the incident reports used for this report did not contain an abundance of information that related to system changes, that does not necessarily mean that the reporting mechanism cannot be used for this purpose. As stated above, individual reports can be useful to addressing specific workplace issues that lead to incidents can yield additional value when the data is aggregated in an electronic format, and themes derived from the aggregated information. Based on relationships that exist between the factors that lead to incidents, the incidents that occur, the impact of the incidents, root causes that address system related problems can be identified.

This analysis can be completed by someone who is familiar with identifying trends between variables within a large data set. When information is queried from a properly designed database, it is possible for an analyst to determine where it is common for a workplace factor (or more than one factor) to lead to one or more different types of incidents. When an analyst identifies correlations between workplace factors and certain types of incidents, the free-form text can be reviewed by someone with an appropriate level of clinical experience who may be able to identify root causes that lead to the workplace factors and the incidents that result.

Individual reporters or managers/delegates in some cases may be able to identify systemic workplace issues that lead to incidents, but this in-depth understanding of the workplace may not be realistic for all health care workers. Reporters
provide some basic information based on the form design. People with the right skill sets can take this information and use it to identify potential workplace improvements. Having someone with the skills to detect relationships between variables in large data sets made up of a number of reports along with someone who has extensive clinic experience to review the free-form descriptions associated with the reports that indicate a trend between workplace causes and incidents provides health care organizations with the potential to make the most out of the information collected by an incident reporting system.
RECOMMENDATIONS

This section will present the recommendations to improve VIHA's incident reporting form and database. This set of recommendations are based on the literature review that summarizes design concerns for incident reporting forms and databases, and is also based on the analysis of the 491 incident reporting forms that were used to examine the effectiveness of the current VIHA incident reporting form.

The recommendations are divided into two sections: short-term recommendations and long-term recommendations. The recommendations are separated because there are some immediate changes to the paper-based incident reporting form that will provide an improvement to the data that is collected by the organization.

The long-term recommendations will require additional planning and resources. These recommendations would represent important improvements to VIHA's incident reporting process, but can be implemented after the short-term recommendations are addressed.

Short-term recommendations on how to improve the VIHA incident reporting form and data aggregation process

Below is a summary of the recommended changes to the incident reporting form:

1. Consider removing infrequently used options in the incident “Type” classification system.

Based on the data collected in the incident “Type” fields, it is clear that some of the options available to reporters were considered more useful to reporters than others. As identified in the literature review, there is no proven taxonomy that has been used in a general medical setting, and a crucial attribute of any taxonomy that is used is that it is easy for reporters to use and that it does not confuse or frustrate reporters. However, fields that were used sparingly should not automatically be removed from the form because it might be important to learn about some type of incidents that do not happen very often but that must be identified when they do occur.

One option that should be considered in the design of the VIHA incident reporting form is to look at the detailed tables in Appendix 7 and determine which “Type” options were used infrequently and when these options are considered close in their meaning to another option, consider removing one of the options from the incident reporting form. This would help simplify the form, provide a more concise
classification of incident “Type” without compromising the validity of the data collected and aggregated by the Patient Safety Office at VIHA.

See recommendation #5 in this section for a related opportunity to improve the classification of incident “Types” and the factors that lead to incidents.

2. Ensure that a free-form field that seeks information about the factors that led to an incident is included in the incident reporting form.

Free-form descriptions of the factors that lead to incidents are valuable and should be included in the VIHA incident reporting form. Although some of the forms that were filled out by reporters did contain fields that sought this information, the majority of the incident reporting forms did not. In future design adjustments for the incident reporting form, free-form fields that seek information about the factors that led to an incident should be included.

3. Adjust the free-form fields provided to managers / delegates to improve usefulness of the data.

Based on this analysis, having two main fields that clearly state what information is needed will improve the usefulness of the information. The following two free-form fields with the following headings would make it clear to managers what information is needed to improve patient and staff safety:

- What caused this incident?
- How could this incident have been prevented? Include recommendations for system changes if needed.

This recommendation recognizes the usefulness of the field that is currently being used, and reflects an adjusted wording that combines the second and third fields and focuses on what can be done to improve patient safety.

4. Ensure that a tick box to track staff feedback is included on incident reporting forms.

Including a prompt to managers/delegates to indicate if they have provided feedback and then tracking the results is an essential tool to ensure that reporters receive feedback. The tick box should be included in all incident reports.

As identified in the literature review, providing feedback to reporters is a key component in the success of any incident reporting system. Including a component in the incident reporting for that would allow for an organization to track how often reporters receive feedback will help ensure that reporters understand how their report contributed to the ongoing improvement of the work environment and would encourage potential reporters to continue to provide
incident reports. Over time, an organization can aim to improve the percentage of reporters that receive feedback.

5. Provide a classification scheme with corresponding check-boxes for reporters to indicate the factors that lead to incidents, in addition to a free-form field.

It is desirable to provide reporters with a taxonomy to identify factors that led to an incident using tick box options in addition to a free-form description of the incident. As identified in the literature review, combining a classification in addition to free form information (as is arranged with the tick box classification of incident “Type” in addition to the free-form description of the incident) would provide the ability to examine the relationship between causes and effects when this information is aggregated in an electronic format, along with having the benefits of the richness associated with qualitative descriptions of factors that lead to incidents.

Additionally, as described in recommendation #1, there are tick box fields for incident “Type” that could be better described as an incident cause instead of an incident type. For example, as the VIHA incident reporting form is structured “communication” is one of the possible incident “Types” that can be selected by respondents. In many cases communication would likely be better described as one of the causes of an incident instead of the type of incident. This assertion is supported by the fact that the “Communication / Documentation” incident type was not used very often in the West Coast General Hospital reports but was still cited as one of the improvement opportunities to prevent a variety of different types of incidents.

Dekker (2003) notes it is a common flaw with many taxonomies to combine options to classify an incident by the factors that led to an incident along with options to describe the type of incident that has occurred. This common problem is present with VIHA’s incident reporting process. There should be two different sections to specify what caused the incident separately from what type of incident that occurred.

This change to the VIHA incident reporting form would provide a mechanism to more effectively examine relationships between causes of incidents and the types incidents that occur.

6. Design and implement a relational database that can aggregate incident reporting form data to identify specific and workplace system related safety improvements

As identified in the literature review, with a properly designed relational database and a skilled data analyst, themes and trends can be drawn from aggregated reports and used to make recommendations that address system changes that
lead to improved patient and staff safety. Additionally, the database must be
designed so that there is no access to information that can connect reporters to
incident reports. This will protect people who want to make a report on an
incident without fear of potential negative consequences.

Each of these six recommendations represent a significant step towards
increasing the quality and utility of the data collected through the VIHA incident
reporting form. The following benefits would be realized through the
implementation of the recommended changes:

- Information will more precisely identify the type of incidents that occur;
- A more complete picture of the factors that lead to incidents will be
  provided;
- The relationships that exist between workplace factors and the occurrence
  of various types of incidents can be identified;
- A more effective tool will ensure that reporters receive feedback on the
  incident reports they submit; and
- An enhanced ability to identify system related workplace factors that lead
  to various types of incidents will be a key outcome of the improvements.

Each of these benefits would lead to improved patient and staff safety outcomes
for VIHA.

**Long-term recommendations to improve the VIHA incident reporting form
and data aggregation process**

7. Implement an electronic / web-based tool to increase the quality of data
collected and to make data entry for reporters easier, which will increase
reporting rates.

As identified in the literature review, electronic systems for collecting incident
information have the potential to avoid some of the drawbacks associated with
paper-based incident reporting systems.

Implementing an online incident reporting option in addition to the current paper-
based system would allow potential reporters with a method for reporting that
could not only improve response rates, but would also mean less work for a clerk
to enter the information from a paper form into a database. Also, an online
system would help prevent the possibility that the paper forms get lost between
the time they are filled out and the time they are sent to the Quality and Patient
Safety Office at VIHA.
Additionally, with an electronic form of data input would allow for VIHA to consider a comprehensive taxonomy that only allows users to view possible classification options based on information entered by the user. Branching taxonomies that guide a reporter through possible options are often too complicated to be included in a paper based form.

The implementation of a web-based reporting system should not replace the current paper-based reporting method. Instead, the web-based system should be treated as a supplement to the current reporting process that offers the benefits of electronic incident reporting while still offering flexibility to potential reporters to use the most convenient option to suit their workflow and work environment. As noted in the literature review, flexibility and ease of reporting is crucial to the success of an incident reporting system, and for some health care professionals a paper-based reporting system might be more convenient to use than a web-based system.

This recommendation is considered a long-term recommendation because it takes a considerable amount of resources and time in order to successfully design and implement an electronic incident reporting system. Although there are a number of variables that can affect the time it will take to implement this recommendation (financial resources dedicated to system development and testing, organizational support for implementation, internal information technology expertise, internal incident reporting expertise) it is likely that this is a multi-year project.

According to White (2007), the following development steps and associated costs must be taken into account:

- Hardware design and setup
- Software development, purchase of licensing
- Development/selection of classification system
- User training and testing
- Ongoing use education
- Adequate resources to provide ongoing analysis and system governance for incident reporting process related recommendations
- Communication support for the incident reporting process outcomes to provide incentives for reporters

In addition to ensuring that the organization provides the resources that are required to complete each of these steps, user testing must be used to ensure that proper design considerations are incorporated into the web-based tool. For example, a web-based tool must be sensitive to the fact that in a busy work environment someone may be required to leave the computer without completing a report and it must be possible for the reporter to continue the report at a later time without having to re-enter in information. Issues such as this will likely be
identified through user testing and feedback during the development phase of an incident reporting application.

Based on the literature review completed for this report, if properly designed and implemented, an online incident reporting system can be an important tool in improving safety for patients and staff.

8. Ensure the Quality and Patient Safety Office has the resources to analyze incident reporting data, investigate potential safety improvement recommendations, and ensure accountability to implement workplace improvements.

Once a web-based incident reporting system is established, VIHA must have the resources necessary to be able to operate and use the data collected through the system. A web-based incident reporting system requires a significant investment of financial and human resources to make the system effective.

According to Billings, (as cited by White, 2007) “these systems cannot be run with a couple clerks and a keypunch operator”. The people who are providing the incident reports are experts in their field, and the analysis of these reports also must be completed by people with sufficient expertise in a medical setting. (White, 2007) It is common that organizations do not provide adequate resources to properly analyse and communicate data collected from incident reporting systems. (Johnson, 2003)

In order to effectively use incident reporting data, it is essential that the Quality and Patient Safety Office has support to have staff that have expertise in the following areas actively working on analysing information, formulating recommendations and ensuring that recommendations are acted upon:

- quantitative data analysis to examine the relationships between variables in a data set that reveal common problems that lead to incidents;
- extensive medical background to understand and analyze the qualitative information provided in the reports (factors that lead to incidents, analysis of potential improvements);
- experience in root cause analysis to formulate potential workplace improvements; and
- staff that have organizational support and authority to ensure that recommendations are acted upon and there is accountability within VIHA management to consider and prioritize the implementation of workplace improvements.
CONCLUSION

The purpose of this 598 Management Report is to review and analyze the process for medical incident reporting in VIHA and recommend changes to how information about incidents is collected and reported.

The purpose of collecting information about incidents is to understand what is required to prevent incidents from occurring, and ultimately to improve patient and staff safety. By understanding what types of incidents occur, and the administrative or system changes that might have prevented such incidents, VIHA management can take appropriate action.

The recommendations presented in this report were generated from the literature review, which provided an understanding of current practices in medical incident reporting in addition to the evaluation of the current VIHA incident reporting form, which was based on a set of 491 incident reporting forms from the West Coast General Hospital.

The recommendations focus on improving the incident reporting form and database used to collect information in order to improve the quality of the information collected. In turn, this information will provide VIHA with a key component that is needed to improve patient and staff safety.

The set of recommendations provides VIHA with steps that can be taken in the short and long term to improve the incident reporting form and database used by the organization. The short-term recommendations will provide an immediate improvement of the data that is currently being collected. The long-term recommendation of implementing a web-based online reporting system with further enhance the ability of reporters to report incidents and will facilitate timely data collection, analysis and implementation of workplace improvements. Each of these recommendations will represent a significant improvement in VIHA’s ability to learn from incidents and will improve patient and staff safety.

While the scope of this report is limited to focusing specifically on the incident reporting form and database, in further studies VIHA should consider improvements to how incident information is used to generate workplace improvement recommendations, accountability mechanisms for implementing recommendations that are made as a result of the information that is collected using the incident reporting process, and communication strategies for the incident reporting process. Collecting information about incidents is not useful if there is not a plan to use the information to make workplace improvements and then communicate the impact that incident reporting can has the organization. Each of these considerations are just as important as collecting quality incident reporting data and should be a future focus for VIHA.
REFERENCES


Pace, W.D.; Staton, E.W.; Higgins, G.S.; Main, D.S.; West, D.R. & Harris, D.M. (2003) Database design to ensure anonymous study of medical errors: a


A. Project Objectives:

The purpose of this 598 Management Report is to review and analyze the Vancouver Island Health Authority (VIHA) system for incident reporting and recommend changes to how information about incidents is collected and reported.

The purpose of collecting information about incidents that occur is to identify incidents and manage risks for the recurrence of the incidents that clients and staff are exposed to. By understanding what types and risks of incidents are reported, and the potential administrative or system changes that may prevent such incidents, VIHA management can take appropriate action.

VIHA is in the process of implementing a new incident reporting system, which is designed to collect more complete incident information than the previous process. This management report will analyze the information collected and reported in incident reporting system and how this information can be used to develop information systems aimed at learning about incidents reported in order to manage risk.
B. Rationale

This project is important because VIHA recognizes that incident reporting is an opportunity for ongoing learning that can be used to improve the outcomes of their clients and staff. The incident reporting involves the identification, analysis and evaluation of incidents, formulation and implementation of recommendations and administrative/system changes and monitoring of outcomes to prevent future incidents.

This project will provide VIHA with recommendations to improve its incident reporting process to develop information systems for managing risk.

C. Background

VIHA has a formal incident reporting policy outlining the purpose, definitions and procedures in relation to how incidents are reported and managed. The procedures that are followed include actions that must be followed by line staff and supervisors/management.

Staff involved in incidents are responsible for reporting incidents. Supervisors and managers are responsible for the follow-up of incidents reported by staff, and implementing and/or recommending administrative/systems changes to prevent similar incidents.

An integral part of the process of reporting of incidents and the documentation of administrative or system changes that could prevent future incidents is the “Incident Reporting (IR) Form”. The IR Form is used to collect information about the site/program and unit/department where the incident is reported, the type and risk reported, the follow-up report process (incident management) that occurred, and implementation and recommendations regarding system or administrative changes. The IR Form is completed using a paper form (on-line, electronic IR Form coming soon).

Pilot sites for incident reporting included 2 Royal and 3 Royal at the Royal Jubilee Hospital, Aberdeen Hospital, West Coast General Hospital and Home and Community Care Program. The on-line IR Form has been field tested at 1 Royal at the Royal Jubilee Hospital.

D. Methodology:

Analysis will include both qualitative analysis and limited quantitative analysis. There is an abundance of research that has been completed in the health care field about how to improve incident reporting information systems for patient safety. This project will rely heavily on the research that has been done elsewhere on how to improve the process for incident reporting.
In additional to a literature review, this project will involve the use of individual (anonymous) data (IR Forms) and aggregated IR Reports produced by VIHA. Personally identifiable data involving clients and staff will be removed from the incident records by VIHA before they are given to the student.

Below is a list of research tasks:

8. Conduct literature reviews based on important works that have been completed on incident reporting for patient safety
9. Review qualitative data in the IR Forms
10. Analyse quantitative data reported in the IR Reports
11. Draft preliminary findings and recommendations and provide for review with project supervisor and client for review and comment
12. Incorporate supervisor and client feedback
13. Finalize deliverables

E. Data Sources

There are two main sources of information that will be used in this project:
1. Literature review
2. De-identified IR Forms and IR Reports

The client can provide access to de-identified incident report data. No other permissions are needed to complete the project.

F. Results

The key deliverable for this project is a formal report recommendations about how VIHA could improve incident data collection, storage and reporting.

G. Ethical and/or Research Review

There are no human subjects for this research. The student will use de-identified administrative data (incident reports) and academic literature on incident reporting. Therefore, a “Joint UVic/VIHA Waiver from a Full Ethical Review” form will be submitted for this project.
APPENDIX 2 – 598 ETHICAL REVIEW FORM
APPENDIX 3 – VIHA Incident Reporting Policy

1.0 General Administrative

1.2 Incident Management

1.2.2 Incident Reporting

1.0 Purpose

The VIHA recognizes incident reporting as a process for ongoing learning in order to improve outcomes of clients (defined under 3.0 Definitions) and staff and to reduce risk. The process involves the identification, analysis and evaluation of incidents, formulation and implementation of recommendations and administrative/system changes and monitoring of outcomes. Incident reporting involves risk assessment and risk management (defined under 3.0 Definitions).

2.0 Policy

All incidents (defined under 3.0 Definitions) must be reported using the Incident Reporting Form. Staff will adhere to 4.0 Procedures described in this policy.

3.0 Definitions

Incident – includes an adverse event, hazard, near miss or unusual occurrence. Note: For staff related incidents, the Employee Incident Exposure Symptom Injury and Accident Investigation Report (available from Wellness and Safety), must also be completed.

Adverse Event – An injury caused by health care management rather than by the underlying disease or condition of the client; also called harm. Health care management refers to all aspects of the health care system, not just actions or decisions by staff. Not all, but a sizeable proportion of Adverse Events are the result of errors. (Reference: adaptation of Kohn K.T., To Err is Human, Institute of Medicine 1999)
Hazard – a set of circumstances or a situation that could harm a client’s interests, such as their health or welfare. (Reference: Davies, JM, Herbert P, Hoffman, C, The Canadian Patient Safety Dictionary 2003)

Near Miss – An error that could have caused harm, but did not reach the client because it was intercepted. (Reference: When Things Go Wrong - Copyright 2006 Massachusetts Coalition for the Prevention of Medical Errors) Also called good catch)

Unusual Occurrence – an event, situation or process that contributes to, or has the potential to contribute to, a client injury, a staff injury, or degrade our ability to provide optimal patient care. (Reference: National Patient Safety Foundation - Definitions www.npsf.org/html/defcit.html)

Person(s) Affected – Includes clients, visitors, staff, physicians, volunteers and others.

Client – includes patients, residents and families.

Staff – VIHA employees, physicians, medical residents, students and other health care providers.

Harm – Death, or temporary or permanent impairment of body function and/or structure requiring intervention. (Reference: National Patient Safety Foundation – Definitions www.npsf.org/html/defcit.html)

Follow-Up Report Process – the process established and administered by the manager to identify staff responsible for the procedures/tasks that support Incident Reporting.

Most Responsible Practitioner (MRP) – A medical staff member with active, provisional or approved locum tenens privileges at the time of MRP designation who is designated responsible for the coordination, facilitation and timely management of the client’s medical care. (Reference: 12.1.1 Most Responsible Practitioner Policy)

Risk Assessment - Staff will classify the risk (severity) of the incident as Level 1, Level 2, Level 3, Level 4 or Level 5 according to Chart I – Risk Assessment below.

Risk Management – the process of managing risk that involves the following five steps:

1. Identifying incidents and assessing risk (Risk Assessment);
2. Analyzing and evaluating incidents;
3. Formulating recommendations and administrative/system changes;
4. Implementing recommendations; and
5. Monitoring outcomes from the implementation of
recommendations and administrative/system changes.

Chart I – Risk Assessment

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>No harm, damage or loss. Possible Near Miss.</td>
</tr>
<tr>
<td>Level 2</td>
<td>Mild/temporary harm, damage or loss. Requires initial, but not prolonged intervention.</td>
</tr>
<tr>
<td>Level 3</td>
<td>Moderate/temporary harm, damage or loss. Requires short-term intense intervention.</td>
</tr>
<tr>
<td>Level 4</td>
<td>Major harm, damage or loss. Requires intense intervention to sustain life. Possible Adverse Event.</td>
</tr>
<tr>
<td>Level 5</td>
<td>Severe/permanent harm, damage or loss. Requires prolonged intervention to sustain life. Possible death or destruction. Possible Adverse Event.</td>
</tr>
</tbody>
</table>

4.0 Procedure

4.1 The Role of Staff (Reporter/Discoverer and/or MRP) in Response to an Incident

When an incident occurs, staff will:

1. Ensure the safety of clients, staff and others and provide immediate medical/first aid attention as required.
2. Notify the Manager/Delegate, MRP and/or Medical Director if the level of risk for the incident is a Level 4 or 5. If after hours, notify the Administrator-On-Call. Preserve any materials needed for investigative purposes. If equipment is involved, attach a label indicating **DO NOT USE** and contact Biomedical Engineering to secure it.
3. Document the facts only of the incident on the client’s health record, including: the results of any examinations; what injuries, if any were sustained; and any treatments which may have been administered. Do not record on the health record or the Kardex that an Incident Reporting (IR) Form was completed.
4. Complete the IR Form, specifying the level of risk (1-5). Staff wishing to remain anonymous should not record name, employee number and work phone number. If the incident is an Adverse Event, refer to 9.3.1 Disclosure Policy. If appropriate, submit an Emerging Issue/Untoward Incident Report at [http://intranet.viha.ca/crit_incident/](http://intranet.viha.ca/crit_incident/).
5. Forward the completed IR Form as specified by the Manager. The IR Form should be completed as soon as possible and forwarded not later than the end of the shift.
6. Participate in next steps/action plan.
7. Review the IR Reports.
4.2 The Role of the Manager/Delegate, MRP and/or Medical Director

Following notification of the incident, the Manager/Delegate, MRP and/or Medical Director will:

1. Confirm safety of clients, staff and others.
2. Confirm that the MRP has been notified.
3. Confirm that materials needed for investigative purposes have been preserved, as necessary.
4. For Level 4 and Level 5 incidents, notify the Director, Executive Director and Executive Medical Director, and if appropriate, notify others, such as Risk Management and Quality and Patient Safety. If the incident is an Adverse Event, refer to 9.3.1 Disclosure Policy. Ensure that an Emerging Issue/Untoward Incident Report at http://intranet.viha.ca/crit_incident/ has been completed if appropriate.

For all incidents, the Manager is responsible for establishing and administering the Follow-Up Report Process that supports Incident Reporting. For all IR Forms received, the Manager (or designate) will:

5. Ensure that the IR Form received is accurate and complete.
6. Analyze and evaluate the incident. If follow-up is required by another unit/department, forward the white and yellow copies of the IR Form to the appropriate manager/delegate.
7. Determine next steps/action plan and consider the need for further investigations.
8. Formulate proposed/required recommendations, noting any administrative/system changes.
9. Once follow-up is completed, sign the IR Form and mail the white copy to Quality and Patient Safety. Retain the yellow copy for your files.
10. Implement approved recommendations, as appropriate.
11. Monitor the implemented recommendations and modify, if required and as appropriate.
12. Follow up on administrative/system change recommendations with the Director and/or Quality and Patient Safety.
13. Provide appropriate feedback, specifically to the Reporter/Discoverer, and education for staff.

Following receipt of the IR Reports, the Manager/Delegate and/or Medical Director will:

14. Review the IR Reports.
15. Share the IR Reports with staff.
4.3 The Role of the Director, Executive Director and/or Executive Medical Director

Following notification of the incident, the Director, Executive Director and/or Executive Medical Director will:

1. For Level 4 and Level 5 incidents, notify Senior Executive, as appropriate, and include the proposed next steps/action plan.
2. Participate in next steps/action plan, if required and as appropriate.
3. Approve and/or revise proposed/required recommendations, as appropriate.
4. Review the implemented recommendations with the Manager/Delegate, Senior Executive, and/or Quality and Patient Safety, if required and as appropriate.
5. Follow-up on administrative/system change recommendations with the Manager/Delegate, and/or Quality and Patient Safety, as appropriate.

Following receipt of the IR Reports, the Director, Executive Director and Executive Medical Director will:

6. Review the IR Reports with the Manager/Delegate, Senior Executive and/or program quality councils.

4.4 The Role of the Quality and Patient Safety

Quality and Patient Safety will:

1. Receive IR Forms from managers/delegates.
2. Support the follow-up of administrative/system change recommendations with the Manager/Delegate, Director, Executive Director and Executive Medical Director, Senior Executive, Quality and Patient Safety and/or program quality councils.
3. Record the IR Forms received in the IR Database.
4. Support the preparation and distribution of IR Reports for units and departments.
5. Review IR Reports.

The Quality Improvement Consultants will:

6. Provide immediate consultation on incidents reported as required.
7. Support the analysis and evaluation of incidents and investigation, as required.
8. Support in the formulation of the next steps/action plan, as required.
9. Support the formulation of recommendations, as required.
10. Support the implementation of recommendations, as required.
11. Support the follow-up on administrative/system change recommendations with the Manager/Delegate, Director, Executive Director, Executive Medical Director and program quality councils.
12. Review IR Reports.
References

**VIHA Policies**
9.3.1 Disclosure Policy  
1.2.1 Immediate Notification of an Emerging Issue  
12.1.1 Most Responsible Practitioner  
1.5.1 Privacy Rights and Confidentiality of Personal Information

**Provincial Acts, Statutes and Regulations**
Freedom of Information and Protection of Privacy Act

**Bibliography**


<accessed: June 30, 2006>

APPENDIX 4 – VIHA INCIDENT REPORTING FORM EXAMPLES

New form, page 1

New form, page 2

New Form, instructions

Old form, page 1

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APPENDIX 5 – TAXONOMY DESCRIPTIONS

Below is a summary description of various types of incident taxonomies that have been used by health care organizations to classify incidents.

Multilevel classification systems

Multilevel classification systems collect information about:
- Factors that led to the incident
- The level of harm
- Location
- People involved
- Factors that are identified that can prevent further incident from occurring

Within this broad description, there have been a number of systems to collect this type of information, some with a wide range of options to select, while others employ a very simple taxonomy. Paper-based incident reporting mechanisms have a limited amount of room for displaying information without the form being large and awkward to handle. However, with an appropriate level of detail this type of taxonomy can be easy for reporters to use and understand. Electronic systems are able to use branched menu systems that allow users to select information, and follow-up possible selections are provided while irrelevant selection possibilities are removed from view.

An example of a multilevel taxonomy is the classification system used by Fernald et al. (2004) in the design of the Applied Strategies for Improving Patient Safety (ASIPS) incident reporting system.

In each report submitted in the ASPIS system, information must be included in the five domains displayed below:

<table>
<thead>
<tr>
<th><strong>ASIPS Taxonomy Summary</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domain</strong></td>
</tr>
<tr>
<td>Patient Information</td>
</tr>
</tbody>
</table>
| Outcome | • Harm  
| | • Interventions as a result of the error |
| Course of behaviour | • Type of event  
| | • Location of Event  
| | • Intent  
| | • Event Process  
| | • Cause |
| Participants | • Participant  
| | • Contribution |
| Discovered by | |
In each of these domains, there are a number of areas that must be addressed to provide further details about the event. The classification system is collected with a web-based tool, and allows the under to navigate through detailed about each of the domains. A full description of the classification system can be downloaded at: [http://www.errorsinmedicine.net/taxonomy/asips/default.aspx](http://www.errorsinmedicine.net/taxonomy/asips/default.aspx)

A second example of a multilevel classification system is the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) patient safety taxonomy described by Chang et al. (2004).

The JCAHO taxonomy, like the ASIPS taxonomy, uses five domains, each with sub-domains, to collect information about incidents. The domains and sub-domains in the JCAHO taxonomy are displayed below:

<table>
<thead>
<tr>
<th>JCAHO Taxonomy Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain</td>
</tr>
<tr>
<td>Impact of the incident</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>The type of event</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Characteristics of the</td>
</tr>
<tr>
<td>people and setting</td>
</tr>
<tr>
<td>involved</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>The cause of the event</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Possible prevention</td>
</tr>
<tr>
<td>and mitigation actions</td>
</tr>
</tbody>
</table>

Within each of the sub-domains there are more than 200 additional sub-levels to provide further details about incidents. Each of these domains includes the flexibility to provide free-text information to elaborate on the details of the incidents.

Each of these taxonomies offers an example of an exhaustive list of possibilities to categorize information about each incident in each of the domains that are needed to understand the relationship between incident causes, effects and incident characteristics.

Considering number of possible classifications that reporters can select, it is essential that for all of the options to be made available that an electronic system using drop down boxes that only provides the options that are relevant for each incident. With a paper-based reporting tool, the list of options would be pages long and would be confusing for reporters. A second downside to the
comprehensive nature of the options for each domain is that using the system may be considered time consuming and there might be a need for ongoing training for staff who are new to the organization.

A significant drawback that has been identified with this form of incident classification that rely on collecting information on the domains outlined in these examples is that they lack a theoretical basis that attempts to understand how human cognition led to the error and can lead to the development of remedial measures (Kostopolou, 2006).

**Summary of advantages of multilevel classification systems:**
- Can offer simple, common sense way to categorize common incident types and factors that lead to incidents.
- Requires little training for potential reporters to understand.
- Are the most common type of classification used in incident reporting systems.

**Summary of disadvantages of multilevel classification systems:**
- Lacks a theoretical basis of understanding how incidents are caused.

*Latent and active cause classification systems*

In multilevel taxonomies, there are usually various domains that information is collected in. Within each of the domains, there are various taxonomies that can be used.

One method of using a taxonomy within a specific domain is to provide information about the nature of the causes of medical incidents. Understanding the causes of medical incidents can be a key factor in identifying what types of workplace improvements are necessary in order to improve patient safety. In medical error literature a distinction is made between medical errors that occur at the sharp end (known to as “active errors”) and errors made in the blunt end (known as “latent errors”).

A latent error is one that results from a failure in the system, such as a problem with the physical environment, the equipment, organizational policies or the work culture. An active error is the result of human behaviour (White, 2007). A classification system that prompts reporters to distinguish between active and latent errors attempts to provide information about where efforts to prevent further incidents should be focused.

The classification of latent and active errors by Battles and associates (as described by White, 2007) is an example of a system that seeks to identify the nature of the cause of medical errors. Below is a summary of the categories that are used with this classification system:
### Latent and Active Error Taxonomy Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Sub-category</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Latent Errors: errors that result from underlying causes</strong></td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td>External</td>
</tr>
<tr>
<td></td>
<td>Design</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>Materials</td>
</tr>
<tr>
<td>Organizational</td>
<td>External</td>
</tr>
<tr>
<td></td>
<td>Transfer of knowledge</td>
</tr>
<tr>
<td></td>
<td>Protocols/procedures</td>
</tr>
<tr>
<td></td>
<td>Management priorities</td>
</tr>
<tr>
<td></td>
<td>Culture</td>
</tr>
<tr>
<td><strong>Active Errors: errors that result from human behaviours</strong></td>
<td></td>
</tr>
<tr>
<td>External</td>
<td>Beyond control of the organization</td>
</tr>
<tr>
<td>Knowledge-based behaviours</td>
<td>Knowledge-based errors</td>
</tr>
<tr>
<td></td>
<td>Rule-based behaviours</td>
</tr>
<tr>
<td></td>
<td>Qualifications</td>
</tr>
<tr>
<td></td>
<td>Coordination</td>
</tr>
<tr>
<td></td>
<td>Verification</td>
</tr>
<tr>
<td></td>
<td>Intervention</td>
</tr>
<tr>
<td></td>
<td>Monitoring</td>
</tr>
<tr>
<td>Skill-based behaviours</td>
<td>Slips</td>
</tr>
<tr>
<td></td>
<td>Tripping</td>
</tr>
<tr>
<td>Other</td>
<td>Patient-related behaviour</td>
</tr>
<tr>
<td></td>
<td>Unclassifiable</td>
</tr>
</tbody>
</table>

Identifying the whether incidents are a result of active errors or latent errors can provide valuable information about whether workplace improvements should be focused on underlying organizational and technical factors or human behaviour factors.

It is important to note that this type of taxonomy is not mutually exclusive to the multilevel taxonomies described above, as this type of taxonomy is focused on one of the domains contained within the numerous domains used in a multilevel taxonomy.

**Summary of advantages of latent and active cause classification systems:**
- Provides a way to identify how incidents occur. This information can be used to identify and target potential solutions.
- Can be combined with multilevel classification systems described above.
Summary of disadvantages of latent and active cause classification systems:

- Has not been actively used and proven in a healthcare setting.
- Would require a significant amount of training for potential reporters to understand the terminology.

Theory-based classification systems

Theory-based classification systems attempt to provide insight into the cognitive causes of medical errors and are based on theories of how humans interact with their environment. According to Zhang et al. (2005), without a theoretical understanding of the nature of medical errors, it is difficult to provide insight into how errors occur and how they can be prevented.

In order to provide a theoretical basis for understanding how humans interact with technology, Zhang et al. propose using a cognitive taxonomy, based on James Reason’s research on human error that seeks to understand how medical errors can result from human-technology interactions and Donald Norman’s seven-stage theory of action (2005). According to Zhang et al., in order to prevent human error, “the system in which humans work must be adapted to their cognitive strengths and weaknesses and must be designed to ameliorate the effects of human errors that do occur” (2005).

Under the cognitive taxonomy proposed by Zhang et al., human errors can be classified into two main categories, as adopted by Reason’s classification of human error: slips and mistakes. The proposed taxonomy is displayed below:

Although Zhang et al. believe that understanding the cognitive basis for how medical errors occur, they also state that this is only one part of the picture because not all errors would be captured in this classification (2005).
Examples of medical errors that could occur that would not be captured in this taxonomy is if a transfusion pump malfunctions, this is not the result of an individual making an error.

A practical drawback of the taxonomy is that it has yet to be tested and refined in a healthcare setting.

**Summary of advantages of theory based classification systems:**
- Provides a theoretical basis for understanding how incidents occur and how they can be prevented.

**Summary of disadvantages of theory based classification systems:**
- Has not been actively used and proven in a healthcare setting.
- Would require a significant amount of training for potential reporters to understand the terminology.
- Not every type of incident that reporters can report on can be classified in the theory-based classification system described by Zhang et al. (2005).