

Hospital-Based Views and Practices Related to Incident Reporting and Patient Safety: A  
Qualitative Comparative Study of Two Divisions

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## Abstract

Patient safety has been on the research agenda since 2000, when unnecessary harm to patients in providers' care came to light. In 2005, the improvements in patient safety fell short of expectations, and the patient safety research community recognized that the issues are more difficult to resolve than first thought. One of the tools to address this vexing problem has been voluntary incident reporting systems, although the literature has given incident reporting systems mixed reviews.

This qualitative comparative case study comprises 85 semi-structured interviews in two separate divisions of a tertiary care hospital, General Internal Medicine (GIM) and Obstetrics and Neonatology (OBS/NEO). The main line of questioning concerned incident reporting; general views of patient safety were also sought.

This is a thesis by publication. The thesis consists of a general introduction to patient safety, a literature review, a description of the methods and cases, followed by the manuscripts. The thesis concludes with a summarization of the findings, and implications of the study.

Manuscript one focuses on the reporter end of incident reporting systems. It asks what frames underlie GIM nurse and physician self reporting and peer reporting practices. The findings showed that frames that inhibit reporting are shared by physicians and nurses, such as the fear of blame frame regarding self reporting, and the tattletale frame regarding peer reporting. These frames are underpinned by a focus on the individual, despite the organisational message of reporting for learning. A learning frame is an enabler to incident reporting. Viewing the objective of voluntary incident reporting as learning allows practitioners to depersonalize incident reporting. The focus becomes preventing recurrence and not the individual reporting or reported on.

Manuscript two again focuses on the reporter end, and on one type of reportable incident – a problem that healthcare practitioners can fix themselves. The study asks: when faced with such a problem, do practitioners fix it in the moment and forget about it, or do they fix it in the moment and report it? We found that “fixing and forgetting” was the main choice that most GIM practitioners made in situations where they faced problems that they themselves could resolve. These situations included a) handling near misses, which were seen as unworthy of reporting since they did not result in actual harm to the patient, b) prioritizing solving individual patients' safety problems, which were viewed as unique or one-time events, and c) encountering re-occurring safety problems, which were framed as inevitable, routine events. The paper argues that fixing and forgetting patient safety problems encountered may not serve patient safety as well as fixing and reporting. The latter approach aligns with a preventive view of patient safety.

Manuscript three focuses on the practice of double checking, drawing from interviews conducted in both GIM and OBS/NEO. It asks what weaknesses are in the double checking process and what alternative views can help the double checking process enhance patient safety. The findings showed weaknesses in the double checking process, such as: a) double checking trusted as an independent process, b) double (or more) checking as a costly and time consuming procedure, and c) double checking as preventing reporting of near misses. It is proposed that there are alternative ways of viewing and practising double checking in order to enhance patient safety. These include: a) recognizing that double checking requires training, b) introducing automated double checking, and c) expanding double checking beyond error detection. The paper argues that practitioners need to be more aware of the caveats of double checking, and to view the double checking process through alternate lenses to help enhance its effectiveness.

Manuscript four focuses on the reporting system more comprehensively, and attends to the reporting process in GIM and OBS/NEO. This is a comparative case study of the two divisions, and considers the different stages in the process and the factors that help shape the process. The findings showed that there were major differences between the two divisions in terms of: a) what comprised a typical report (outcome based vs communication and near-miss based); b) how the reports were investigated (individual manager vs interdisciplinary team); c) learning from reporting (interventions having ambiguous linkages to the reporting system vs interventions having clear linkages to reported incidents); and d) feedback (limited feedback vs multiple feedback). The differences between the two divisions can be explained in terms of: a) the influence of litigation on practice, b) the availability or lack of interprofessional training, and c) the introduction of the reporting system (top-down vs bottom-up approach). A model based on the findings portraying the influences on incident reporting and learning is provided.

This thesis contributes to an in-depth understanding of front line perspectives on incident reporting systems and safety, and aims to provide insights into improving patient safety. Implications for practice and research will be addressed.

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## Acronyms

AE – Adverse Event

AHRQ - Agency for Healthcare Research and Quality

AIMS – Australian Incident Monitoring System

AoM – Academy of Management

BMJ – British Medical Journal

CAES – Canadian Adverse Events Study

CADTH – Canadian Agency for Drugs and Technology in Health

CIHR – Canadian Institutes of Health Research

CLABSI – Central Line Associated Blood Stream Infection

CMPA – Canadian Medical Protective Association

CORE – Course On Research Ethics

CPSI – Canadian Patient Safety Institute

CUSP – Comprehensive Unit Safety Programme

GIM – General Internal Medicine

GTT – Global trigger tool

HIROC - Healthcare Insurance Reciprocal of Canada

IOM – Institute of Medicine

IRS – Incident reporting system

MRN – Medical Record Number

MORE OB – Managing Obstetrical Risks Effectively

NICU – Neonatal intensive care unit

OBS/NEO – Obstetrics and Neonatology

OHRI – Ottawa Hospital Research Institute

PSLS – Patient Safety Learning System

SOGC – Society of Obstetrics and Gynecologists of Canada

TOH – The Ottawa Hospital

UK – United Kingdom

US – United States

WHO – World Health Organization

## Chapter 1 - Introduction

Since the seminal work of the Institute of Medicine's 1999 study *To Err is Human* (Kohn, Corrigan, & Donaldson, 1999), much has been written on patient safety. There have been accomplishments, even though progress has been "frustratingly slow" (Pronovost, Miller, & Wachter, 2006; Shojania & Thomas, 2013; Wachter, 2010). One of the main tools promised to help improve patient safety is incident reporting systems (Donaldson, 2005; Kohn et al., 1999); yet many have reported being disappointed with the unfulfilled promise of these systems (Noble & Pronovost, 2010; Pham, Girard, & Pronovost, 2013; Shojania, 2008). This is a study of incident reporting systems; it helps voice perspectives from the front line on incident reporting and patient safety generally.

Hospital incident reporting systems have been studied in the literature. The focus of these studies have typically been on trying to get more reports into the system by studying facilitators and barriers to reporting (Brubacher, Hunte, Hamilton, & Taylor, 2011; Noble & Pronovost, 2010). These studies often focus on only one profession (Pfeiffer, Manser, & Wehner, 2010; Waring & Currie, 2009), and /or one department (Lubberding, Zwaan, Timmermans, & Wagner, 2011; Mutic et al., 2010; Subhedar & Parry, 2010; Tighe, Woloshynowych, Brown, Wears, & Vincent, 2006). This study extends the literature on hospital incident reporting by looking at the entire incident reporting process, and comparing two different hospital divisions.

Despite the attention to incident reporting in the literature, there is still a sense that incident reporting systems are not yielding the benefits they should (Pham et al., 2013; Shojania & Thomas, 2013). Social sciences have added a revealing lens through which to study incident reporting systems, by allowing different research questions to be asked, and

using various approaches to study phenomena (Iedema, 2009). While much extant literature reports on the numbers of incidents reported and on taxonomies (de Vries, Ramrattan, Smorenburg, Gouma, & Boormeester, 2008; Mahajan, 2010; Parker et al., 2010), fewer studies attend to the dynamics present at the front line for the practitioners involved in the incident reporting process (Iedema, 2009). The data informing this study are in-depth semi-structured interviews with a variety of healthcare practitioners who were asked about their views and practices related to incident reporting specifically and patient safety more generally. This allowed a view of the dynamics and nuances of the front line's perspectives, revealing a more complex view than is often reported.

This study investigated a local incident reporting system, aiming to extend the literature on conditions under which front line healthcare practitioners report, and to understand the entire reporting process in two different hospital divisions. It also interrogated patient safety generally, and one technique (double checking) was further investigated.

### **Organization of the thesis**

This is a thesis by publication (also known as a thesis by article). As such, the majority of the findings will be found in the manuscripts section. The thesis proceeds with a literature review (Chapter 2), whereby patient safety and incident reporting will be discussed. The methods chapter (Chapter 3) treats how the study was conducted; it addresses data collection and analysis, the grant funding this study, as well as ethics and quality considerations. The following chapter (Chapter 4) explains the context of the study, outlining the two divisions in which this study took place, as well as a brief description of

the incident reporting system. The results (Chapter 5) are the manuscripts that form the core of this thesis. They are

1. Hewitt TA, Chreim S, Forster A. Sociocultural Factors Influencing Incident Reporting Among Physicians and Nurses : Understanding Frames Underlying Self- and Peer-Reporting Practices. *Journal of patient safety. In Press.* doi: 10.1097/PTS.000000000000130.
2. Hewitt TA, Chreim S. (2015) Fix and forget or fix and report: a qualitative study of tensions at the front line of incident reporting. *BMJ Quality & Safety*, 24, 303-310. doi:10.1136/bmjqs-2014-003279.
3. Double Checking – A Second Look (currently in “Revise and Resubmit” status with the *Journal of Evaluation in Clinical Practice*)
4. Incident Reporting: A Comparative Study of Two Hospital Divisions

The final chapter (Chapter 6) highlights salient themes from the manuscripts, the contributions of this study, its limitations, as well as recommendations for practice and research.

The next chapter outlines the literature in patient safety and incident reporting.

## Chapter 2 - Literature review

In this chapter, I present a brief history of patient safety, both overall and early days at the turn of the century. I continue with a lens of prevention, intervention and postvention of fields of patient safety while introducing incident reporting systems. A review of the prevalent lens of the incident reporting literature followed by other ways to approach incident reporting systems follows. The chapter concludes with a development of the research questions.

### A Brief History of Patient Safety

Many people can quote a line of the Hippocratic Oath, the mantra that doctors recite at their licensing ceremony that has become woven into our popular culture, “First, do no harm”. As such, the idea of patient safety is not a new idea; its origins lie in antiquity<sup>1</sup>. Throughout the ages, various echoes of patient safety have left their mark on the history of healthcare. A number of physicians, notably Alexander Gordon in 1795, Sims in 1835, Oliver Wendall Holmes in 1843 and Ignaz Semmelwies in 1847, believed the cause of puerperal fever (the main cause of maternal mortality) was the lack of hygiene of the physicians who moved between performing an autopsy and delivering babies. This suggestion was met by resistance in the physician community, which was comprised of “gentlemen” who could not be implicated in such a problem (Dixon-Woods, 2013; Vincent, 2010). These early reflections on patient safety focussed mostly on the individual doctors, and their fiduciary responsibility to their patients, asking the doctors to be more vigilant, and remarking on the lack of competence that had been demonstrated. Hence, the attention to individual performance has a long history in medicine, and is still apparent today.

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<sup>1</sup> Some dispute that this came from Hippocrates; Galen was a later ancient Greek physician to whom this has also been attributed. The popularization of the oath as a Western moral standard came from Worthington Hooker in 1847 (Ilan & Fowler, 2005)

Florence Nightingale, the founder of modern nursing, observed that hospitals were making patients sicker, but without identifying any specific causal agent (Vincent, 2010). Her comments may well have been among the first to not attribute blame to a practitioner, but to look at the problem more holistically – the seeds of a systems view.

Elihu M Schimmel published “The Hazards of Hospitalization” in the *Annals of Internal Medicine* in 1964 (the paper was reprinted in *BMJ Quality and Safety* in 2003), and is likely the first systematic study of the rate of iatrogenic – or hospital caused – harm, finding it to be about 20%. He concluded the study by stating “The number and variety of these reactions emphasizes the magnitude and scope of hazards to which the hospitalized patient is exposed” (Schimmel, 1964, p. 109). As such, there has been a recognition that hospitals have known about problems in patient safety for some time.

Notwithstanding Schimmel’s paper (and a few others in the literature at that time), the main publication that gave rise to patient safety as an academic discipline (Stelfox, Palmisani, Scurlock, Orav, & Bates, 2006) was the Institute of Medicine (IOM)’s *To Err is Human* in 1999 (Kohn et al., 1999). The report was written in response specifically to three studies – the Harvard Medical Practice Study in 1984 and studies in Colorado and Utah in 1992 - that had been undertaken to assess the problem of avoidable Adverse Events (AE) in hospitals, whose collective numbers reported that 48 000 – 96 000 patients died annually due to medical error. The general public learned about this otherwise academic publication through the analogy of “a jumbo jet crashing daily” being equivalent to the number of Americans dying needlessly in hospitals – and that public would not tolerate the commercial aviation industry sustaining such a fatality rate. The effect of *To Err is Human* was substantial – it changed the conversation in healthcare from focussing exclusively on the

individual provider to appreciating the influence of systems, in order to achieve the greatest gains in improving hospital patient safety.

### **Patient Safety - Activities in the early 2000s**

The American experience continued with subsequent publications from the IOM such as “Crossing the Quality Chasm” in 2001 (Richardson et al., 2001). Additionally, the orientation of institutions such as the Institute for Healthcare Improvement (<http://www.ihl.org>), the Agency for Healthcare Research and Quality (<http://www.ahrq.gov/>), and the National Patient Safety Foundation (<http://www.npsf.org/>) on patient safety and healthcare quality began the United States’ journey in this research and practice agenda.

The United Kingdom had a similar journey, in that its seminal publication “An Organization with a Memory” (Chief Medical Officer, 2000) had assessed the rate of AE of hospital admissions at about 10%. As well, The Health Foundation (<http://www.health.org.uk/>) focussed on patient safety and healthcare quality, independent of the National Health Service (<http://www.nhs.uk>) that provided health care. Australia’s Patient Safety Foundation (<http://www.apsf.net.au/>) had reacted to problems in anesthesia in the late 1980’s, and had its AIMS (Australian Incident Monitoring System) by the late 1990’s, although the seminal Australian study assessing the AE rate (16%) was published in 1995 (Wilson McL. et al., 1995). The World Health Organization had begun its efforts in global patient safety through World Alliance for Patient Safety in 2003. There are many reports spanning many different areas of the discipline on the WHO website (<http://www.who.int/patientsafety/en/>).

The Canadian journey had a slightly different trajectory. As peer countries were assessing the extent of the patient safety problem in their jurisdictions, Canada got off to a slower start.

International jurisdictions such as the United States of America, United Kingdom and Australia have already recognized that health-care safety concerns are real, that their systems are prone to error and failure, and that measures must be taken to reduce the risk... There is an acknowledged lack of definitive information on the rate of adverse events in Canadian health care. (Wade, 2002, p. 1)

As such, the 2002 report of the National Steering Committee on Patient Safety (endorsed by the College of Physicians and Surgeons of Canada) recommended the creation of the Canadian Patient Safety Institute (CPSI <http://www.patientsafetyinstitute.ca>), and that a baseline study of AE be conducted in the Canadian context. In May 2004, the Canadian Adverse Events Study (CAES - also known as the Baker-Norton study) was published in the Canadian Medical Association Journal. The methodology of the retrospective chart review had been used in the Harvard Medical Practice Study: nurses or health records professionals found charts that met at least one screening criterion; these charts were then passed to physicians who assessed the extent of the injury, and if it was caused by healthcare provision. The CAES was conducted in 1 teaching, 1 large community and 2 small community hospitals in each of British Columbia, Alberta, Ontario, Quebec and Nova Scotia. Excluding the Emergency Department, Obstetrics and Psychiatry, the study reported that the risk of an AE was 7.5% for admitted adult patients. Since this time the Canadian patient safety baseline studies (commissioned by the CPSI) have expanded to Paediatrics, where rate of avoidable harm was found to be 9.2% (higher than that of adults); notably vulnerable were children in Neonatal Intensive Care Units (NICU) in academic hospitals (Matlow et al., 2012). Home care was also assessed, and the AE incident rate was found

amongst three provinces to be 10.1% per client year (Blais et al., 2013). Other studies of patient safety in non-hospital contexts that did not attempt to find an AE rate included studying long term care facilities (Wagner & Rust, 2008), primary care (Kingston-Riechers et al., 2010), emergency pre-hospital services (Atack & Maher, 2010), psychiatry (Procyshyn, Barr, Brickell, & Honer, 2010) and home care (Doran et al., 2009; Lang, Edwards, & Fleischer, 2008; Macdonald & Storch, 2010). Overall, patient safety has been identified as an issue throughout the healthcare continuum.

With the evidence of the extent of patient safety problems (borne largely from retrospective chart review), the healthcare community began to address patient safety. Bravely, the IOM asserted “The committee believes a 50% reduction in errors over five years is imperative” (Kohn et al., 1999, p. 70). However, when 2005 came, Leape and Berwick assessed the status of patient safety, asking “why isn’t healthcare demonstrably and measurably safer?” (Leape & Berwick, 2005, p. 2387), despite the flurry of activity that had taken place since 1999. At the ten year anniversary of *To Err is Human*, a large collection of academics began their paper “Transforming Healthcare – A Safety Imperative” with the sentence “Healthcare is unsafe” (Leape et al., 2009).

During this time, hospitals created a tool by which they could track their own progress – the Global Trigger Tool (GTT) (Baines et al., 2013). Concurrently, the language had changed from adverse event to patient harm (Burnett, Carthey, & Vincent, 2013, p. 34). Studies that had re-assessed the extent of the patient safety problem using the GTT found rates of patient harm ten times as high as the initial studies (Classen et al., 2011; James, 2013), and trying to find improvement with the GTT was as elusive (Landrigan et al., 2010). However, a longitudinal study using retrospective chart review and early AE definitions

found the AE rate to be virtually invariant (if not increasing) (Baines et al., 2013). Shojania had reminded the patient safety community that multiple methods for assessing patient safety are necessary – which was echoed by others (Meyer-Masseti et al., 2011; Olsen et al., 2007) – lest we befall the fate of the Indian folk tale of people describing [erroneously] an elephant from only a very limited view (Shojania, 2010). In their critique of using GTTs as a track-able patient safety metric, Pronovost and Wachter noted “Bottom line, we really don’t know if patient safety is improving” (Pronovost & Wachter, 2013, p. 167). Overall, while there has been some progress (notably the Michigan Keystone project on central line associated bloodstream infections or CLABSI) (Pronovost et al., 2010)), patient safety progress continues to be “frustratingly slow” (Wachter, 2010).

### **Areas of patient safety**

Patient safety is a vast field which can be seen through lenses proposed by renowned thanatologist Edwin Shniedman through his analysis of suicide, as reported by Leenaars (Leenaars, 2010). Shniedman argued that suicide should be looked at in three phases: PREvention, INTERvention and POSTvention. These phases can also be applied to the field of patient safety – whereby we define the reference point to be an “incident” or “adverse event”. The emphasis on prevention, intervention, and postvention, arguably applies to patient safety as well. What follows is an acknowledgement of other areas of patient safety, and how the pre/inter/post-vention theme applies to incident reporting systems.

### **Prevention**

As the name implies, the areas of patient safety that can be labelled as preventive are those that do not allow an incident to take place, although some would also include successful mitigation measures (Kessels-Habraken, Van der Schaaf, De Jonge, & Rutte, 2010). Specific preventive strategies are written about constantly in the literature; a review

of these was undertaken by Shekell, Pronovost and Wachter (2013). The interventions they recommend for immediate adoption, as well as the interventions that they endorse with some reservation, are in Table 1. Overall, much effort has been expended in creating programmes or systems that prevent incidents (or worse) from happening in the first place. As a qualitative researcher who must be aware of one's own biases and preconceptions, I place myself in this area of the patient safety research – preferring prevention to other areas of research.

<b>Strongly Encouraged Patient Safety Practices</b>
Preoperative checklists and anesthesia checklists to prevent operative and post-operative events
Bundles that include checklists to prevent central line-associated bloodstream infections
Interventions to reduce urinary catheter use, including catheter reminders, stop orders, or nurse-initiated removal protocols
Bundles that include head of bed elevation, sedation vacations, oral care with chlorhexidine, and subglottic-suctioning endotracheal tubes to prevent ventilator associated pneumonia
Hand hygiene
“Do Not Use” list for hazardous abbreviations
Multi-component interventions to reduce pressure ulcers
Barrier precautions to prevent healthcare-associated infections
Use of real-time ultrasound to central line placement
Interventions to improve prophylaxis for venous thromboembolisms
<b>Encouraged Patient Safety Practices</b>
Multicomponent interventions to reduce falls
Use of clinical pharmacists to reduce adverse drug events
Documentation of patient preferences for life sustaining treatment
Obtaining informed consent to improve patients’ understanding of the potential risks of procedures
Team training
Medication reconciliation
Practices to reduce radiation exposure from fluoroscopy and computed tomography scans
Use of surgical outcome measurements and report cards, like the American College of Surgeons National Surgical Quality Improvement Program
Rapid Response Systems
Utilization of complementary methods for detecting adverse events/medical errors to monitor for patient safety problems
Computerized provider order entry
Use of simulation exercises in patient safety efforts

**Table 1 - Tables C & D of Making Health Care Safer II : An Updated Critical Analysis of the Evidence for Patient Safety Practices (Shekelle et al., 2013, p. ES12,13)**

Note the absence of incident reporting systems from their list of recommended patient safety practices, highlighting instead bundles, checklists and hand hygiene. The only reference to incident reporting systems is the weaker recommendation of the “Utilization of complementary methods for detecting adverse events/medical errors to monitor for patient safety problems”.

Incident reporting systems are not thought of as preventive tools, as their name implies that an incident need occur before a report is written. Insofar as learning takes place after that incident to prevent recurrence, incident reporting systems can be seen as preventive systems, but only *after* something bad triggered the need for an incident report. However, if instead the reporting system is used to note hazards and “accidents waiting to happen”, it could be a very powerful preventive tool in the patient safety arsenal. This will be addressed in the manuscripts Fix and Forget or Fix and Report and the Comparison paper.

### **Intervention**

This is an area of strength in healthcare – once something is recognized as going wrongly, and is simultaneously urgent - healthcare’s immediate reaction (crash carts, emergency surgery, various audible overhead codes depicting urgent events) is swift and often effective. In the spectrum of proactive to reactive safety, healthcare has often been seen as very strong in the reactive sphere. In a paper for the Health Foundation, Hollnagel (2012) noted that healthcare could benefit from moving from a reactive to a proactive approach.

Strictly speaking, incident reporting systems are not an intervention tool, as they are not directly interfacing with patient care.

### **Postvention**

This has recently become a field of focus in patient safety. There are two main areas that have dominated the “after the event” patient safety literature, those being disclosure (the act of informing the patient and/or his/her family of patient harm) (Iedema, Allen, Sorensen, & Gallagher, 2011; Lucian Leape & Berwick, 2005; Simpson, Aubin, & Fillatre, 2012) and caring for the second victim (the healthcare provider who may believe he/she is wholly responsible for the patient harm) (Dekker, 2013; Pratt & Jachna, 2015; Wu, 2000). The

inclusion of patients in patient safety programs, often motivated by patient harm, has also been an area of study (Jeffs et al., 2014; Mockford, Staniszewska, Griffiths, & Herron-Marx, 2012; Pinto, Vincent, Darzi, & Davis, 2013; Schwappach, 2010).

Incident reporting systems would often be classified in a postvention category, as the incident has already occurred, which is the trigger to write a report. However, this need not be the case, as mentioned in the section on prevention. If “incidents” are more broadly defined beyond only bad events that have already occurred, near misses and hazards could get reported (Jeffs, Berta, Lingard, & Baker, 2012; Kessels-Habraken et al., 2010). This could result in incident reporting systems not needing to belong to only a postvention patient safety category.

### **Incident reporting**

In this section, I first look at how incident reporting systems have been typically represented in the literature and then address how incident reporting can be viewed from a different perspective.

#### **The prevalent literature**

The seminal document *To Err is Human* (Kohn et al., 1999), which heightened awareness of the patient safety problem, had recommendations on how to proceed to ameliorate the situation. One recommendation that deserved two entire chapters was incident reporting: the importance of mandatory (state) and voluntary (local) reporting systems, as well as an analysis of reporting systems of the day, and the legal ramifications of reporting. The emphasis on incident reporting was taken up by the World Health Organization (Donaldson, 2005), whereby an analysis was presented on why reporting systems were useful, as well as various practical implications regarding establishing reporting systems (process, classification, analysis). Various jurisdictions strongly encourage

institutions to establish incident reporting systems as can be seen in the UK (Emslie & Department of Health, 2001; National Patient Safety Agency, 2004), Australia (Australian Commission on Safety and Quality in Health Care, 2013), the US (The Joint Commission, 2015) and Canada (Accreditation Canada, 2015). Furthermore, in the wake of various crises in healthcare, such as the investigative reporting of problems in radiation therapy in the US (Bogdanich, 2010) and the inquest into the MidStaffordshire Trust problems in the UK (National Advisory Group on the Safety of Patients in England & Group, 2013), there have been calls to implement functioning incident reporting systems. Overall, incident reporting in healthcare is seen as a necessary tool to improve patient safety.

Papers on incident reporting are abundant in the medical literature. Some are very positive about incident reporting, especially those developed in-house for departmental use in emergency care (Tighe et al., 2006), intensive care (Osmon et al., 2004; Pronovost, Thompson, et al., 2006), anesthesia (Mahajan, 2010), and obstetrics and neonate care (Cochrane et al., 2009; Florea et al., 2010; Forster et al., 2006; Skapik, Pronovost, Miller, Thompson, & Wu, 2009). Hospital wide reporting (Swartz, 2011) has also met with success. Some of the facilitators to a successful incident reporting system include the severity of the incident (as perceived by the reporter), the profession valuing reporting, and the ease of submitting a report (Brubacher et al., 2011; Cochrane et al., 2009; Kreckler, Catchpole, McCulloch, & Handa, 2009). However, the most significant facilitator of successful incident reporting systems is feedback to the reporter, especially in the form of change resulting from the reports, allowing the reporter to feel valued (Brubacher et al., 2011; Donaldson, 2005; Jeffs, Berta, Lingard and Baker, 2012). Voluntary incident reporting has met with some success.

Evaluation of incident reporting systems through literature and systematic reviews has been undertaken. In 2009, Dücker et al. stated that "Six studies address the effectiveness of reporting systems as an organizational instrument to detect safety incidents" (p98S), noting that while needing to have complementary methods (e.g. chart review, observation), the studies were quite positive about the use of incident reporting systems in a variety of departments. A review of 28 studies indicated that medication safety is best assured with a multiplicity of methods (Meyer-Masseti et al., 2011). The authors state:

Nonpunitive, confidential, simple and timely voluntary incident reporting can provide valuable background information for subsequent in-depth evaluations such as root-cause analysis and trigger tool methodology. The relative strengths of incident reporting and trigger tools suggest that some combination of these two methodologies be used to optimally detect DRPs (drug related problems). (Meyer-Masseti et al., 2011, p. 237)

The Canadian Agency for Drugs and Technology in Health (CADTH) undertook a systematic review to understand how medical device problems are addressed in incident reporting systems. Their review of 30 studies reported on the barriers to reporting, including lack of recognition that a report should be written, themes of blame, lack of feedback and lack of time, all of which have been reported in the literature (Polisena, Gagliardi, Urbach, Clifford, & Fiander, 2015). Overall, the systematic reviews of healthcare professionals reporting into reporting systems acknowledge problems with the systems, but are on balance positive about the contributions these systems can make to patient safety,

However, some research on incident reporting is less optimistic. With titles such as "The Frustrating Case of Incident-Reporting Systems" (Shojania, 2008), "Underreporting of Patient Safety Incidents Reduces Health Care's Ability to Quantify and Accurately Measure Harm Reduction" (Noble & Pronovost, 2010), "Can We Use Incident Reports to Detect

Hospital Adverse Events?” (Blais, Bruno, Bartlett, & Tamblyn, 2008), and “What to do with healthcare Incident Reporting Systems” (Pham et al., 2013) the papers that evaluate the barriers to successful incident reporting or lament the lack of progress with incident reporting are numerous. Noble and Pronovost (2010) published an Ishikawa (fishbone) diagramme of barriers to incident reporting, summarized in Table 2.

Factors Accounting for Underreporting		
	Barrier Category	Barrier Specifics
Donabedian variables	Structure	Unsure of who should complete the report
		Unclear definition of an adverse event or a near miss
		Unclear of how the reporting system works
	Process	Lack of time to complete reports
		Reports too complex
		Lack of understanding of the benefit to reporting near misses
Outcome	Lack of feedback	
	Makes no difference	
Socio-cultural variables	Attitudes	Perceived unimportant nature of incident
		Verbal open disclosure enough
		Physicians don't get involved with reporting
	Fears - public	Ashamed of what happened
		Fear over confidentiality
		Fear of legal reprisal
	Fears - medical	Fear of adverse media coverage
		Fear of blame/being branded incompetent
		Fear of lack of support
	Fear of unemployment	

Table 2 - Barriers to healthcare reporting, taken from Noble & Pronovost (2010) p. 248

While all these barriers to reporting exist, many having been found in other studies (Brubacher et al., 2011; Hughes & Robinson Wolf, 2008), the barriers that have received most attention have been *Fear* and what is classified in Table 2 as *Outcome*. However, these are not the only problems with incident reporting systems.

Metrics concerning incident reporting systems are problematic. The lack of a denominator (the number of events that could otherwise have happened), is a significant

challenge to incident reporting systems being used as a reliable quantitative metric (Pham et al., 2013; Shojania, 2008). Bias in the type of incidents reported, as nurses report more than physicians, is another concern (Burkoski, 2007; Noble & Pronovost, 2010). Local classification schemes vex the attempt to compare different departments (Burkoski, 2007; Pham et al., 2013), and there are far too many reports in reporting systems to analyze (Cook, 2013; Pham et al., 2013). And, not insignificantly, incident reporting systems are costly (Pham et al., 2013). Comparisons of incident reporting systems with other ways to measure problems in patient safety, be it retrospective chart reviews (Blais et al., 2008; Schildmeijer et al., 2013) or trigger tools (Long et al., 2010) have routinely shown that traditional incident reporting metrics are not trustworthy. However, some have contemplated other quantitative metrics with incident reporting systems borrowed from aviation, such as those in Table 3, which may be more informative than those discussed above.

<b>The percentage of</b>	<b>The average time</b>
incidents where system causes are identified	from incident to completed investigation
incidents where causes of human error are identified	from incident investigation completion to correction
follow-up actions and learning shared	
incidents investigated to root causes	
investigations that show planning failure	
accident reviews with leadership participation	
incident reports that are shared with other units	

**Table 3- Possible quantitative metrics to evaluate an incident reporting system, taken from Burnett, Carthey, & Vincent (2013), p. 15**

Even without redefining metrics, incident reporting is not futile. It can offer a glimpse on the healthcare system (Pham et al., 2013; Vincent, 2004), and can be used to guide local improvement initiatives, aggregate information for uncommon conditions, and improve overall safety culture (Pham et al., 2013). Hence, “Incident Reporting Systems

(IRS) are and will continue to be an important influence on improving patient safety. They can provide valuable insights into how and why patients can be harmed at the organizational level. However, they are not the panacea that many believe them to be” (Pham et al., 2013, p. 154). With this lukewarm endorsement, it is worth investigating other perspectives on incident reporting.

### **Other ways to approach incident reporting systems**

In 2009, *Social Science & Medicine* dedicated a special issue to patient safety that addressed different ways to study it with different priorities, and asking different research questions. Iedema, who wrote the editorial for the special issue, reflected on how the methods inform the findings.

As a general rule, findings reflect the limits and affordances that are inscribed into the methods that were used to produce them. All methods are constrained in this way (Law, 2004). Harbouring different constraints, methods designed to (re)produce in situ accounts of risk and harm, such as (non-) participant observation, interviewing, or video-ethnography, reveal findings that are of a different order compared to chart analyses and incident report investigations. (Iedema, 2009, p. 1701)

In this issue, articles highlighted various novel ways to study patient safety: Mesman (2009) employed a geographic study of the ICU to reveal how patient safety is working, as opposed to exclusively focussing on problems; Kerr (2009) used experiential data as opposed to patient safety metrics to explore how team work may conflict with autonomy; Whyte et al. (2009) performed ethnography using a Burkean analysis and interpreted a preoperative briefing to shed light on motives, actions and making sense of the scene; and Hewett, Watson, Gallois, Ward, & Leggett (2009) used Social Identity Theory and Communication Accommodation Theory to analyze how different medical specialties interrelate. This issue also offered insight into incident

reporting. Waring (2009) contributed his analysis of the culture of medicine, and how ethnographic and narrative research can enrich the current fixation of patient safety which has a “manage and measure orthodoxy” (p1722).

### **Developing the Research Questions**

In this section, I report on the research questions that I pursued as part of this thesis. While the literature and the gaps in the literature underlying these questions are developed in depth in the individual papers, I provide a summary here that shows how the papers are connected and identifies the foci of the papers within the broader area of incident reporting.

### **Interprofessional self and peer reporting**

Reason’s work has been highly influential in healthcare. His Swiss Cheese model (Reason, 2000) is well known in healthcare circles, and was appreciated for its focus away from the front line, which was espoused in initial studies in patient safety (Kohn et al., 1999; Richardson, 2001). He also offered new language, such as *sharp end*, *blunt end* and *latent pathogens* (Hoffman, Beard, Yu, & Dingwall, 2008; Reason, 1990) which again helped front line workers feel less burdened in the event of an error.

Notwithstanding this emphasis on the system as opposed to the individual worker (Leape & Berwick, 2005), healthcare workers still are fearful when errors occur, which serves as a barrier to reporting (Brubacher et al., 2011; Noble & Pronovost, 2010; Pfeiffer et al., 2010). Other barriers to self-reporting that have been cited in the literature include lack of time, a bureaucratic process and the inevitability of error (Brubacher et al., 2011; Burkoski, 2007; Noble & Pronovost, 2010; Waring, 2009). A few facilitators to self-reporting are in the literature, such as severity of the incident, the expectation of the profession, the ease of reporting and feeling as though

the investment in reporting is valued (Brubacher et al., 2011; Whitehead & Barker, 2010). Self-reporting facilitators and barriers have been studied in the literature.

Individual professions and their experience with reporting have also been studied, such as residents (Boike et al., 2013), nursing (Waters, Hall, Brown, Espezel, & Palmer, 2012), and specialist physician studies (Linthorst, Kallimanis-King, Douwes Dekker, Hoekstra, & de Haes, 2012; Waring & Bishop, 2010; Waring, 2005). In Waring's paper on narratives in patient safety, he did not "deal with the horizontal differences between professional groups (nurses and surgeons)" (Waring, 2009, p. 1725). In fact, only a few papers have compared and contrasted physicians' and nurses' reporting practices (Kingston, Evans, Smith, & Berry, 2004), especially in terms of the frames (Chreim, 2006) they hold. Furthermore, while there is plenty of focus on blame on an individual reporter, in the nursing profession, and looking at reporting on one's peer (King, 2001), few studies have combined an interprofessional view with both self and peer reporting. The first research questions of this study, asked in the first manuscript, attempt to fill these gaps:

*Research Question 1:* What enabling and inhibiting frames underlie self and peer reporting practices?

*Research Question 2:* How do these frames held by physicians and nurses differ from each other?

### **Near miss reporting**

*Fixable problems and reporting implications, and double checking*

Many incident reporting systems expect near misses to be entered, in addition to realized events. For example, the WHO guide on Incident Reporting Systems defines adverse events (injury related to medical management), preventable adverse

events (subset of adverse events) and “near miss” or “close call” (serious mishap that has the potential to cause an adverse event), suggesting that all should be reported into an incident reporting system (Donaldson, 2005, p. 8). The Canadian Patient Safety Institute refined these definitions and uses terms such as Patient Safety Incident, a broad label including all of the following: Harmful Incident (reached patient, patient harmed), No Harm Incident (reached patient, patient not harmed) and Near Miss (did not reach patient). The suggestion is to report all Patient Safety Incidents into an incident reporting system (Incident Analysis Collaborating Parties, 2012, p. 8).

Note that the term “adverse event” has been replaced with “harmful incident”, which is shared with others (Burnett et al., 2013), attempting to ensure that the generic term “harm” is not restricted to medically defined adverse events. Note too the difference between a “no harm incident” and a “near miss”, which likely would not have been distinguished in earlier patient safety publications, but has been noted by Kessels-Habraken, Van der Schaaf, De Jonge & Rutte (2010) as an area worthy of investigation.

Near miss reporting is still challenging in healthcare contexts (Mattioli et al., 2012), and is an increasingly popular subject of study. Jeffs et al. had looked at near miss reporting both as a way to “close off the Swiss Cheese holes” (Jeffs, Berta, Lingard, & Baker, 2012) and as a way to investigate individual accountability and collective vigilance (Jeffs, Lingard, Berta, & Baker, 2012). With an increased attention to near misses, “Health care organisations could (1) eliminate failure factors before real accidents may occur, (2) enhance their ability to recover from errors, and (3) improve their safety culture, thereby indirectly improving safety performance”

(Kessels-Habraken et al., 2010, p. 1307). However, the appreciation of near misses is still elusive in healthcare – especially to physicians (Roblee, 2014).

As seen by the WHO definition terms, a near miss is classified as such due to “chance or because it is intercepted” (Donaldson, 2005, p. 8). Few studies have addressed specifically the intercepted type of near miss and its relation to incident reporting. In other words, if the healthcare provider was able to avoid a harmful incident, would this action be worthy of a report in an incident reporting system? Addressing this gap in the literature, the next research question asks

*Research Question 3:* How do frontline healthcare practitioners choose between a) fixing a patient safety problem and forgetting about it, and b) fixing the problem and reporting it into an incident reporting system?

This question is asked in the second manuscript.

Another type of near miss that has not received much attention in the patient safety literature is the near miss caught by a double check. Double checks, while pervasive in health care, have not been subject to randomized control trials (Alsulami, Conroy, & Choonara, 2012). Studies have shown that the double check compliance rate is quite variable (Alsulami, Choonara, & Conroy, 2014a, 2014b), and double checking can be overall ineffective (Armitage, 2009). Notwithstanding the problems, there is great confidence in the process on the part of practitioners (Conroy, Davar, & Jones, 2012; Duggan, Kron, Howlett, Skov, & O’Brien, 1997; Liu, Manias, & Gerdtz, 2012). As double checking is not a strong theme in the patient safety literature, this study adds to the questioning of this ubiquitous process by asking

*Research Question 4:* What are the weaknesses in the double checking process?

*Research Question 5:* What are alternative ways to view and practice double checking in order to enhance patient safety?

The above two questions were pursued in the third manuscript.

### **The incident reporting process**

While incident reporting has enjoyed front and centre stage in the patient safety research literature, much of the literature is focussed on the lack of reporting events into the system, much like Table 2, and the first three manuscripts of this study. The fourth manuscript looks beyond the enablers and inhibitors to entering reports, and addresses the entire reporting process. A few studies give enough detail in their description of the entire reporting process, including analysis and learning phases, that the reader can gather an appreciation of what the process is (Bush, 2010; Cunningham & Geller, 2012; Tighe et al., 2006), although the description is incidental to the main focus of the study. Waring & Currie (2009) do describe a process of how information is handled post incident report submission, and how this process differs between different departments, but their main focus was knowledge management amongst professionals in hospital environments. Overall, there is paucity of studies that investigate the reporting process in its own right, comparing the process between different environments. To fill this gap in the literature, this study asks:

*Research Question 6:* What are the similarities and differences in incident detecting, the analysis process, and learnings from reporting in different hospital divisions?

*Research Question 7:* What factors account for these differences?

In the next chapter, I address the general methodological approach used to answer the above research questions.

## Chapter 3 - Methodology

In this chapter, I describe how patient safety has been addressed through qualitative study, as well as describing specifics of a comparative case study. I outline how the data was collected and analyzed. The chapter concludes with a brief description of the research grant under which this study was conducted, the ethical approvals of the study, and how quality was addressed throughout.

Healthcare has a long tradition of quantitative study, be it through randomized control trials, case-controls, or longitudinal epidemiological trials assessing a multitude of outcome variables. This has extended to the study of patient safety, which was recognized as a problem through retrospective chart reviews (Baker et al., 2004), and chart reviews have guided patient safety's successes (Idema, 2009). However, this approach may not yield any further progress on patient safety (Cook & Wears, 2004) nor reveal the full spectrum of complexities of risks and harms (Idema, 2009), although not everyone agrees with abandoning retrospective chart reviews (Burnett et al., 2013). Benn et al (2009) stated that patient safety has a history of "focusing upon one microsystem, disciplinary perspective or single level of the system" (p. 1775), and that large scale improvement programmes need to account for local context, complex variation, and use multiple measures at different levels of a system over long term studies. Some of the authors reporting on safety culture/climate surveys postulate that a qualitative approach can reveal richer information than questionnaires (Singer, Lin, Falwell, Gaba & Baker, 2009; Etchegaray & Thomas, 2012; Weaver et al, 2013). Hoff & Sutcliffe (2006) argued that qualitative studies using methods of observation, focus groups and interviews can "capture [the] complexity [of medical errors] and allow for more people-focused, contextually based, and 'real-time' study of patient

safety and medical errors in the everyday clinical setting” (p. 5). A special issue of *Social Science & Medicine* was dedicated to showing the importance of qualitative studies in patient safety (Iedema, 2009). This study adds to the growing body of qualitative research on patient safety.

This project adopted a comparative case study design, because case studies are best suited to *how* and *why* questions of contemporary phenomena in a real life context, wherein the researcher has little control over the events being studied (Yin, 2003). Case studies, through a strong appreciation of context, and a rigorous methodological approach, can assist in understanding complex phenomena whose essence might not be fully appreciated using a survey alone (Yin, 2003). The study was bounded by two medical departments in the same tertiary care hospital. Using multiple cases in a cross-case analysis can help “deepen understanding and explanation ... Multiple cases not only pin down the specific conditions under which a finding will occur, but also help us form the more general categories of how these conditions may be related” (Miles & Huberman, 1994, p.173). Furthermore, an embedded design, or having nested cases (such as professions within hospital divisions within a hospital) while complex, “permits induction of richer, more reliable models” (Graebner & Eisenhardt, 2004, p.368).

### **Data Collection**

The data for this case study were semi-structured confidential face to face interviews with participants from General Internal Medicine (GIM) and Obstetrics and Neonatology (OBS/NEO). Both cases began with a quality meeting, where the project was introduced, and initial interviewees were met. The GIM data collection took place in the spring of 2012 and lasted until the end of the summer 2012; the OBS/NEO data collection began in summer 2014 and lasted until early fall 2014. In both departments, key leaders sent out emails to

recruit interviewees. Due to their roles, these leaders were the first interviewees and were key informants, introducing us to other interviewees through snowball sampling (whereby each interviewee is asked “who else should we be talking with”, providing us with more contacts than we would have had otherwise). Some interviewees were purposefully chosen, due to their known history with the reporting system (very enthusiastic reporters, infrequent reporters, analysis role), while others were convenience sampled, due to their availability on a low workload, low acuity day on the unit. Many of the bedside nurses were recruited and interviewed on the spot, whereas many of the other job titles were recruited through email contact. Eighty five interviewees participated in this study in total - a profile of the interviewees by blended job title is in Table 4.

<b>Job Category GIM</b>		<b>Job Category OBS/NEO</b>	
Physicians	<b>11</b>	Physicians	<b>8</b>
Nurse Leaders <sup>2</sup>	<b>5</b>	Nurse Leaders	<b>15</b>
Bedside Nurses	<b>15</b>	Bedside Nurses	<b>15</b>
Pharmacy	<b>3</b>	Midwives	<b>3</b>
Physiotherapists	<b>3</b>	Respiratory Therapy	<b>4</b>
Nursing Support	<b>3</b>		
<b>Total</b>	<b>40</b>	<b>Total</b>	<b>45</b>

**Table 4- Interviewees by generic job title**

There are three types of interviews, according to Patton (2002); the informal, conversational style; the guided semi-structured approach; and the standardized open ended interview (p. 342). The interviews in this study were semi-structured, using an interview guide and probes. Spontaneously worded questions allowing the interviewer to follow leads of the interviewee within the framework set by the guide are some advantages of this style. Further, semi-structured interviews allow for similar topics to be investigated with all interviewees, making data analysis easier (in comparison with a conversational style).

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<sup>2</sup> Nurse Leaders is a term referring to all nurses with a job function not exclusively at the bedside.

Every interviewee was provided with an explanation of the contents of the consent form, and every interviewee signed the consent form in duplicate – one for themselves, and one for the study. The consent form is in Appendix A. While every interviewee was given the right to withdraw from the study, no one did. The interview guide began with questions that first allowed the interviewee to introduce themselves, and then focussed on incident reporting (e.g. introduction of the reporting system, what is reported, who reports, what happens to reports), and was employed as such in the first case of GIM. The question guide evolved in OBS/NEO when different subjects emerged from the early interviews in that department (e.g. the influence of MORE OB, history with reporting systems, debriefing). The two question guides can be found in Appendix B.

All interviews were recorded on a digital voice recorder and transcribed verbatim. Sixty-five hours of interviews took place in this study, with the shortest interview being 15 minutes, the longest being 95 minutes, and the median time being 41 minutes.

### **Data Analysis**

Before beginning to analyze the content of the interviews, I established a code list – various themes that I expected to see based on the literature, and on the questions asked, as per Miles & Huberman (1994). I entered these codes into Atlas.ti, the qualitative research software I used, with explanations (where warranted). These codes were both descriptive (such as “Weaknesses of the incident reporting system”) whereby the code reflects directly the text of the interview, and interpretive (such as “Fear of reporting”), whereby I analyzed and interpreted text that may not have been as closely associated with the code (Charmaz, 2006). Then, with the transcribed interview and the code list, I began to assign codes to various paragraphs in the interview. There were also occasions whereby I realized a theme

was being discussed for which I had no code, and needed to create one. These are labelled inductive codes, and were created as I was coding the interviews. This meant that I needed to re-read interviews already coded to see if this new inductive code would apply, and as such the coding process was iterative. Occasionally, the coding was guided by word searching, whereby a word (such as “double checking”) and its synonyms (e.g. “double-check”, “check”) would be used to identify the passages worthy of coding.

Throughout the analysis, I recorded memos, which are a key tool in qualitative research (Charmaz, 2006; Eisenhardt, 1989; Miles & Huberman, 1994). Memos capture thoughts that need to be followed up, hunches or “gut feelings”, or insights that come to the researcher at any stage of the research process. Memos are often used to refine coding (Miles & Huberman, 1994).

Once all interviews were coded, I proceeded to extract all the quotations by code. I would then read the quotes by code files, and often annotate the files in the .pdfs with further memoes or indications of a quote being highly indicative of a concept. One quality check was trying to stay as close to the quotations as possible (sometimes with reminders from my supervisor), which helped assure that any insight based on data was strongly grounded in the interview material.

The analysis proceeded in chronological order, with GIM being analyzed as the first case, followed by OBS/NEO as the second case. I analyzed each case separately (intra-case analysis) and followed this by a comparison (inter-case analysis) (Miles & Huberman, 1994). Since the data was organized by profession, this allowed analyses both within and across professions. When the same process was repeated for both cases, this allowed an inter-case comparison. These different levels of comparison (within profession, across

professions, and across departments) helped assure that findings were tested both within and across cases to either affirm similar results or reveal contradictory results (Yin, 2003). “The juxtaposition of seemingly similar cases by a researcher looking for differences can break simplistic frames. In the same way, the search for similarity in a seemingly different pair also can lead to more sophisticated understanding” (Eisenhardt, 1989, p.541). Having the different levels of analysis and the different cases to analyze forced me to engage in constant comparison, helping to build a robust study (Eisenhardt, 1989; Yin, 2003).

The study took advantage of flexibility or emergent design (Creswell, 2013) – of being able to approach subjects that were not designed for at the beginning. In this study, conceptually, the Self and Peer Reporting paper or the first study (comparing different professions) and the Comparison paper or the fourth (comparing different departments) were anticipated and planned for at the outset of the study. It is noted that the Comparison paper is the heart of this thesis. The Fix and Forget paper or the second study was emergent from the data collected to that point, and the Double checking paper (or third study) was even more so. The double checking paper was not designed for in the question guide, nor anticipated – it was truly an emergent study that could only have been done in qualitative research with a flexible design, whereby participants were not confined to rigid questions.

#### *Member Checking*

While member checking (Guba & Lincoln, 1985) – which is the opportunity for the study participants to review the researcher’s findings – is a critical stage of qualitative study, many of the interviewees were available only for the interview. Following up with the healthcare professionals individually would have been highly challenging, and might have breached confidentiality. As a compromise, some findings (findings that would be more

pertinent to the unit level rather than findings of the publications) were shared with the initial Quality committees with which the study recruitment began. GIM was given a presentation on preliminary findings in Oct 2012 (at a grant meeting), more solid findings in March 2013 (a local grant meeting) and a presentation to the quality committee in November 2013. OBS/NEO was given a presentation on May 28, 2015 and June 3, 2015. These presentations were given to leaders (and some front line practitioners) with the hope that the findings would be communicated to those who participated in the study. Participants in both departments were in agreement with the analysis and the findings.

### **The research grant under which this study was conducted**

This study, while self-contained, was part of a much larger enterprise. The grant to the Ottawa Hospital Research Institute (OHRI) from the Ontario Research Fund #RE-05-070 was entitled “The use of eTriggers to systematically detect and manage adverse events”. The grant was applied for in advance of my coming to graduate school; as such I did not participate in its writing, but I was paid a stipend from it throughout my studies. The grant was wide ranging, having many different arms of study. Below is the title of each arm of the grant.

- E trigger derivation and validation
- Statistical analyses to identify AE risk factors
- Statistical analysis to define the health and financial impact of AEs
- Legal interpretation of existing legislation and case-law pertaining to appropriate use and disclosure of quality of care information
- Case studies in AE event reduction

This study was conducted under the “Case studies in AE event reduction” arm.

### **Ethics**

As this study was under the grant described above, ethics was applied for through the administration of the grant. Ethics was obtained both at the Ottawa Hospital (where this

study took place) and at the University of Ottawa. Prior to beginning data collection, I needed to successfully complete the TCPS-2: Course On Research Ethics (CORE) ethics course, in compliance with the Tri-Council<sup>3</sup> Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2).

### Quality

Qualitative research is judged using a number of criteria that are summarized by Creswell (2013), based on the work of different methods authors. I explain how these were met in Table 5.

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<sup>3</sup> The Tri-council is the name for the major research funding bodies in Canada: NSERC (the Natural Sciences and Engineering Research Council), SSHRC (Social Sciences and Humanities Research Council) and CIHR (Canadian Institutes of Health Research).

<b>Concept (adapted from (Creswell, 2013))</b>	<b>How criteria was satisfied</b>
Prolonged engagement with the study participants to appreciate a deep understanding of contextual factors	Interviews took place over weeks and months; 85 interviews were conducted with individuals in different positions and in different departments.
Triangulation of data sources to provide corroborating (or disproving) evidence	The main data source was interviews, but documents such as an explanation of the incident reporting system and the drop down menu were obtained and used.
Supervisor review or debriefing	Very close contact with supervisor – every written piece underwent multiple revisions
Negative case analysis	Codes were chosen to be general enough such that e.g. “fear of reporting” encapsulated both sentiments that expressed fear and those that expressed no fear of reporting. When the quotes per code were analyzed, I ascertained if there were discrepant views on the chosen topic, and refined my working hypotheses accordingly.
Clarifying Researcher Bias	While I was aware that I have a preference for preventive rather than reactive approaches, I tried to remain neutral when asking questions of the participants, and transparent to this preference in my work.
Member checking	Presentations of high level findings to quality meetings of both departments
Rich, thick descriptions	Quotations are the heart of the reported findings

**Table 5 - How credibility was obtained throughout the study**

Overall, attention to quality was important throughout the entire study.

The next chapter introduces the cases, and sets the stage for the main section of the thesis – the manuscripts.

## **Chapter 4 - Context of the study**

As mentioned, this study is a comparative case study of the use of a voluntary incident reporting system, and of the views on patient safety in two hospital divisions. In this chapter, I briefly introduce the two departments, as well as the reporting system.

### **The Hospital**

The Ottawa Hospital (TOH) is a teaching hospital with many specialized services serving primarily patients from Eastern Ontario. Its research programme runs primarily out of the Ottawa Hospital Research Institute, and is strongly affiliated with the University of Ottawa. In 1998, the hospital was amalgamated under provincial order (as were many others in the province), and the Civic, Riverside and General Hospitals became TOH. The Riverside is no longer a site of beds and emergency care, but runs day clinics and similar services. The Civic and General campuses both have emergency services and overnight care.

### **General Internal Medicine**

General internal medicine, or GIM, is the largest division in the hospital, and is in the Department of Medicine. The primary patient population is the elderly – many of these patients present with multiple co-morbidities, making care challenging. Additionally, GIM can have a mix of medical problems from any adult age at any one time on the wards, demanding a very broad knowledge base. It also has high readmission rates, which the hospital would like to keep low, in line with provincial initiatives.

Physicians rotate between the campuses, while nurses are stationed at only one campus (I conducted interviews across campuses, although this study did not highlight differences between campuses). With the very diverse (yet primarily aged) population, much time is spent in documentation and patient rounding. Nurses are primarily responsible for 5

patients during the day and 7 overnight, although if more than one nurse is needed for any task, the workload can be greater. Nurses report to a nursing manager, who can have over 100 direct reports. Nursing educators are also available to the GIM units. Other professions directly involved in GIM include respiratory therapists, physiotherapists, pharmacists, social workers, as well as support workers who assist the professionals, such as clerks, personal care assistants and transportation workers. Many hospital services indirectly interface with GIM (diagnostic imaging, laboratory services to name two). The same structure exists on each campus.

### **Obstetrics and Neonatology**

The Department of Obstetrics/Gynecology & Newborn Care is comprised of divisions looking at gynecological care for women, prenatal care (for high risk maternity patients), obstetrics, post-natal care and care for high risk preterm babies (neonatology). This study looked chiefly at the divisions of Obstetrics and Neonatology.

In Obstetrics, there is a one to one nurse to maternal patient ratio (which includes the mother and baby post low risk birth), and there are care facilitators who are responsible for the maternal unit, overseeing the activities of 11-13 nurses. These nurses may also need to be involved in Caesarian or C-sections (both planned and emergency). There is a nursing manager with many direct reports (similar to GIM), a nursing educator, as well as a clinical care leader. This structure exists on each campus.

Obstetricians are responsible for births, chiefly the assisted births (needing forceps or vacuum extraction) and all C-sections. Anesthesiologists will assist with some births (administering epidurals), but are a team member in all C-sections. Family physicians who have admitting privileges care for low risk maternal patients, and if the risk status changes

during the birth (e.g. evolves to needing an emergency C-section), the care is transferred to an obstetrician. Midwives exclusively care for their clients in the hospital (nurses do not assist with midwife patients), but if the risk status changes from low to high, the care is similarly transferred to an obstetrician. Midwives practice at only one of the campuses.

There are high risk baby units (Neonatal Intensive Care Units or NICUs) in the hospital, each with nurses who care for the high risk, often premature, babies (1-3 babies per nurse, depending on acuity). Care facilitators and nurse educators take on similar roles as in the Obstetrics area, whereas the nursing manager and the Clinical Care Leader are shared across the campuses. Neonatologists are at each campus. A neonatologist is present for births in crisis as well as C-sections. Respiratory therapists are also involved in the care of high risk premature babies in the NICU. As with GIM, many other hospital services indirectly interface with Department of Obstetrics/Gynecology & Newborn care.

### **The Incident Reporting System**

The reporting system used at TOH was the Patient Safety Learning System, or PSLS. While PSLS is customized for TOH's environment, it is based on a Datix® platform. PSLS was on every networked computer in the hospital, such that every hospital employee could report. Once a reporter decided to report, the reporter would need to find a free computer, and open the PSLS software. A report began with a patient's Medical Record Number (MRN), and the reporter entered free text (although there are drop down menus in Obstetrics) to describe the facts – no judgement was meant to be in a reported event. There were a few fields for the reporter to fill out, to enable the reviewers to determine not only what happened but where and when it happened, as well as details that could involve other departments. The event reviewers were alerted of the existence of a new report by email. The

review differed in the two departments (see Manuscript 4), but one key part of the review was the ability to share a report with key individuals of different departments who would otherwise not know of a problem that they could help solve. The reporter could track their reports, although very few did. Interviewees were asked and provided feedback on the PSLS – its strengths, weaknesses and opportunities for improvement, which was shared with the participating departments as described under Member Checking in the Methodology section.

The chapter that follows consists of the publications resulting from the study. Each will be prefaced by the citation (if applicable) and any other pertinent information regarding the manuscript.

## Chapter 5 – Manuscripts (Results)

This chapter contains the manuscripts of the thesis. The four manuscripts are (the short title in brackets indicates how a paper will be referred to in the Discussion and Conclusion section);

Self and Peer Reporting – Enabling and Inhibiting Frames (Self and Peer Reporting)

Fix and Forget or Fix and Report

Double Checking

Comparative Study of the Incident Reporting Process (Comparison paper)

A visual depiction of how these manuscripts are interrelated is shown in Figure 1, whereby incident reporting is the central theme. All manuscripts are related to incident reporting – the Comparison Paper most strongly, followed by Self and Peer Reporting and Fix and Forget or Fix and Report. Double Checking can be seen as a subset of Fix and Forget or Fix and Report, but also has its tie to incident reporting. The manuscripts follow Figure 1. As different journals had different requirements for the title page (e.g. including author information or not), I have standardized all title pages to include nothing but the title.

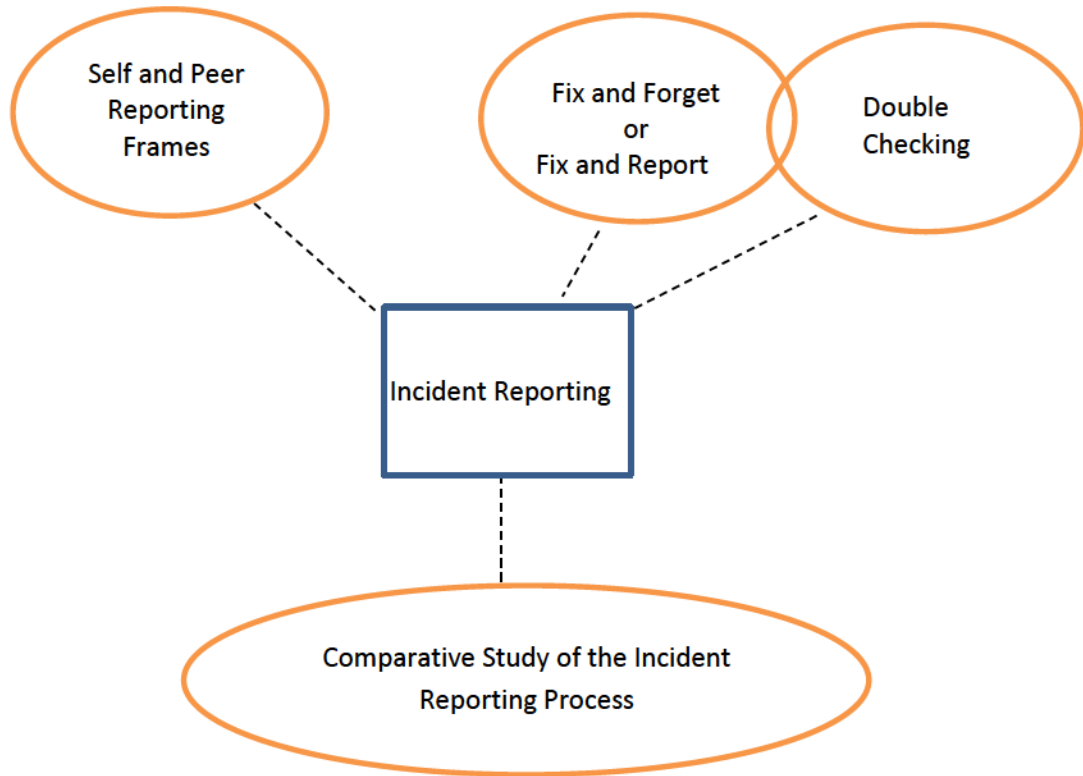


Figure 1 - Visual depiction of how the manuscripts are interrelated

## Manuscript #1 - Self and Peer Reporting

Citation:

Hewitt, T. A., Chreim, S., & Forster, A. (2014). Sociocultural Factors Influencing Incident Reporting Among Physicians and Nurses : Understanding Frames Underlying Self- and Peer-Reporting Practices. *Journal of Patient Safety, In press*. doi: 10.1097/PTS.0000000000000130

This is an Open Access article.

**Manuscript title:**

Socio-cultural factors influencing incident reporting among physicians and nurses:  
Understanding frames underlying self and peer reporting practices

## ABSTRACT

**Objectives:** Voluntary reporting of incidents is a common approach for improving patient safety. Reporting behaviours may vary because of different frames within and across professions, where frames are templates that individuals hold and that guide interpretation of events. Our objective is to investigate frames of physicians and nurses who report into a voluntary incident reporting system and to understand enablers and inhibitors of self and peer reporting.

**Methods:** Qualitative case study – confidential in-depth interviews with physicians and nurses in General Internal Medicine in a Canadian tertiary care hospital.

**Results:** Frames that healthcare practitioners employ in their reporting practices serve as enablers and inhibitors for self and peer reporting. Frames that inhibit reporting are shared by physicians and nurses, such as the fear of blame frame regarding self reporting, and the tattletale frame regarding peer reporting. These frames are underpinned by a focus on the individual, despite the organisational message of reporting for learning. A learning frame is an enabler to incident reporting. Viewing the objective of voluntary incident reporting as learning allows practitioners to depersonalize incident reporting. The focus becomes preventing recurrence and not the individual reporting or reported on.

**Conclusions:** Physicians and nurses employ various frames that bound their views of self and peer incident reporting – further progress should incorporate an understanding of these deep seated views and beliefs.

## **Introduction**

Voluntary incident reporting systems are one approach to improve patient safety<sup>1</sup> as evidenced by their inclusion in many hospital accreditation programmes. For example, the Joint Commission (US) has Sentinel Events as part of their Comprehensive Accreditation Manual for Hospitals<sup>2</sup>, Accreditation Canada now has voluntary incident reporting as one of its Required Organizational Practices<sup>3</sup>, and the Australian Commission on Safety and Quality in Healthcare has a standard entitled Governance for Safety and Quality in Health Service Organisations, whereby incident reporting is a core requirement<sup>4</sup>. When properly used, incident reporting systems allow data to be collected and aggregated for the determination of patterns that may lead to corrective action<sup>5</sup>. Reported incidents can also be used as learning tools<sup>6</sup>.

However, voluntary incident reporting systems have also been described as a source of frustration, falling short of generating intended benefits. Their effectiveness is diminished by barriers to voluntary incident reporting, some of which are related to concerns about repercussions to the reporting health care professional<sup>7-9</sup>. This has been the case despite a continual de-emphasis on blame and responsibility of the front line worker<sup>10,11</sup>, and an increased emphasis on the systems properties of patient safety<sup>12-16</sup>. A better understanding of factors influencing the decision to report incidents will facilitate efforts to improve systematic collection of patient safety threats.

Voluntary incident reporting systems are complex socio-technical systems, which can benefit from evaluations using a social science lens<sup>17,18</sup>. Using these approaches, researchers have identified factors that enable and hinder incident reporting<sup>19-21</sup>. Research has shown

variability in beliefs about, and the practice of, reporting<sup>5</sup>. Variations are observed across and within professional disciplines<sup>22</sup>. There are also variations in practices of self reporting and peer reporting. As incident reporting systems are intended to detect trends and patterns<sup>1</sup>, any source of variation will undermine the credibility of results. Thus, understanding factors contributing to varying practices is important.

We undertook this qualitative study to better determine the views of those who do and do not self and peer report. To perform this work, we considered one source of variation to be the ‘frames’ that practitioners apply to the practice of reporting. Frames are templates that individuals hold cognitively and that guide interpretation of events<sup>23,24</sup>. They are derived from individuals’ past experiences and social milieu and are used to guide an individual’s actions in particular scenarios<sup>25</sup>. It is not uncommon for practitioners working in the same site to hold different frames<sup>5,26</sup>. We wanted to better understand the frames that enable and hinder self and peer reporting, as well as the differences between these frames. Furthermore, we wanted to understand what frames were employed within and across professional disciplines. Understanding underlying frames would allow organizations and workgroups to communicate with and train professionals in ways that would promote both self and peer reporting, and that would reduce variability in reporting practices.

### **Literature Review**

Several works have contributed to positioning of errors within a systemic framework. James Reason’s work has been highly influential in this context<sup>27</sup>. Reason proposed multifactorial causes for any accident<sup>28</sup>. Some of these causes are at the front line (physician, nurse) and are proximal to the patient – what Reason called the sharp end. However, other causal

factors are not as visible, but contribute possibly to even more incidents at the front line, given the scope of their coverage (procedures, management, regulations). These are distal from the patient – what Reason called the blunt end. His earlier work<sup>29</sup> describing active errors as those at the sharp end differing from, and often resulting from latent errors - errors at the blunt end - is still important to a holistic understanding of accident causation.

Reason's ideas were utilized in the seminal patient safety publication *To Err is Human* by the Institute of Medicine<sup>30</sup>, and the National Academy's *Crossing the Quality Chasm*<sup>31</sup>, which have set the stage for patient safety discussions to go beyond the focus at the front line.

Other works in safety more broadly have continually de-emphasized the sole responsibility of the front line worker, trying to promote a more holistic understanding of how systems are generally safe yet vulnerable to accidents<sup>32-38</sup>. Notwithstanding these system views, there is still a strong perception amongst front line health care practitioners that individuals play a critical role in preventing an incident, or indeed causing an incident. Research on reporting behavior by health care professionals shows that enablers and obstacles to reporting are rooted in beliefs that the individual at the front line holds responsibility for incidents and/or that reporting incidents has consequences at the individual level. This focus on the individual permeates practices related to self and peer reporting.

A primary inhibitor for self reporting is fear to report. Burkosi<sup>39</sup> speaks of leadership in health care blaming individuals for error as being a significant impediment to front line reporting; a fishbone diagramme in Noble and Provonost<sup>8(p.248)</sup> illustrates classes of fear

(professional and public) as two of many barriers to incident reporting. In a systematic review of reporting, Pfeiffer, Manser and Wehner's<sup>40</sup> evidence-informed psychological framework on factors influencing willingness to report includes fear as an influence on a front line worker's willingness to voluntarily report an incident. They also present a decision making framework to report, including factors such as individual and organizational, the perception of the incident reporting system and the incident characteristics as being factors practitioners use in their willingness to report. Other inhibitors to self reporting include the perception that errors are inevitable<sup>20</sup>, that reporting is overly bureaucratic<sup>20,41</sup>, and that incident reports are used as a gauge of incompetence<sup>42</sup>. Facilitators for self reporting are less commonly addressed, but include duty of the profession<sup>43</sup>, and feeling as though one is making a difference<sup>42</sup>.

Peer reporting – reporting an incident believed caused or not prevented by a peer – has its own set of barriers and enablers. Peer reporting practice encounters “powerful group norms against tattling” and work groups that “make peer reporting a proscribed and risky behavior”<sup>44(p.39)</sup>. Kingston<sup>45</sup> showed that physicians prefer to keep incidents “in house”, prioritizing loyalty to colleagues, but that nurses peer report out of a sense of duty to their profession. A systematic review of nurses' reporting practices by Whitehead and Barker<sup>43</sup> revealed that confidentiality enabled peer reporting, along with incident severity, the experience of the nurse and personal feelings and beliefs. King<sup>46,47</sup> constructed a decision making framework that encompasses individual, situational and organizational variables in concert with the severity of the incident and the intentionality of the peer's action that govern a nurse's choice to report a fellow nurse. Other barriers to peer reporting include unknown consequences for the reported peer<sup>48</sup>, and for the reporter<sup>49,50</sup>.

Despite the studies that have looked at reporting practices, gaps exist in terms of comparing self and peer reporting, as well as in terms of exploring the frames underlying self and peer reporting facilitators and barriers. Frames are schemata that individuals hold and that guide interpretation of events<sup>25</sup>. Frames are rooted in individual and socio-cultural experiences, and the two are closely intertwined<sup>25,51,52</sup>. Individuals and groups working in an organization might perceive their environment in different ways because they hold different frames, and this results “in differential strategies for action across the organization”<sup>26</sup>. In this study, we focused on the frames that enable and inhibit self and peer (including interprofessional) reporting among physicians and nurses. Thus, we ask two research questions: What enabling and inhibiting frames underlie self and peer reporting practices? How do these frames held by physicians and nurses differ from each other?

## **Methods**

This study was part of a larger research project on voluntary incident reporting and safety in a teaching hospital in Ontario, Canada. The reporting system at the hospital is ostensibly available to all employees through any networked device (e.g. computer). The incidents are entered using the patient’s medical record number and the identity of the reporter is known. The reporter enters a narrative describing an incident using the passive voice and facts, but does not record their judgement concerning why an incident occurred. The incidents are sent to Clinical Managers who investigate them locally, and log them in the electronic system. The incidents are then reviewed by physician Clinical Reviewers to assess if harm was caused to the patient, and are sent to Core Reviewers, who assess larger hospital issues. We focused our study on General Internal Medicine – one of the largest departments in the hospital. The study began in spring 2012, with a quality review meeting whereby the

researchers were introduced to key personnel who would later become interviewees. Over five months, two researchers (both independently and together) confidentially interviewed hospital personnel. The Chief Physician and Clinical Director were key informants, each of whom recommended other personnel to interview based on our request to sample individuals with a variety of views and practices related to incident reporting. This process yielded twenty-three additional interviews purposefully sampled. To increase the number of physicians in the study and to reach residents, an email was sent out to which two physicians and three residents responded. Thus, overall, thirty in-depth interviews with physicians and nurses were undertaken as follows: seven attending physicians (including the Chief Physician and Clinical Reviewers), three residents, Clinical Director of nursing, four nursing leaders (Clinical Managers and Nurse Educators, referred to as Educators), and fifteen registered and practical nurses with a range of experience and reporting practices. The interview included questions about the physicians' and nurses' reporting and safety practices, as well as the reasons underlying their practices. Interviews averaged 45 minutes, and were digitally recorded and transcribed. Data analysis was undertaken by two researchers (TH, SC) who met to discuss the themes in the interviews and the derivation of codes based on the data gathered. Atlas ti software was used to code the interviews and retrieve quotations. A third researcher (AF) – not involved in data gathering – also participated in reviewing quotes and the emerging analysis. Through our collective work, we identified the enablers and inhibitors to self and peer reporting, and analyzed the frames used by physicians and nurses to explain their decisions to report or not to report. We organize our findings under two overarching headings: enabling frames and inhibiting frames of self and peer reporting.

## **Results**

In this paper, we focus specifically on frames that enable/hinder self and peer reporting, and on the differences in the frames of physicians and nurses. This is not to say that interviewees did not speak of other foci of reporting. For example, participants indicated that insufficient time is an element in any type of reporting, which we consider under a “reporting logistics” framework that is not discussed here. Similarly, a “first, do no harm” theme that shows a patient centric view was evident in the interviews, and was discussed extensively in relation to more general safety concerns. However, these themes are not the focus of this study; comparing self and peer reporting and their underlying frames is the present objective. In the sections that follow, we elaborate and provide illustrative quotations on each of the frames that enable and inhibit self and peer reporting, and we compare the frames held by physicians and nurses.

### ***Enabling Frames of Self and Peer Reporting***

We found that there are three main frames that frontline healthcare practitioners employ that enable self reporting: professional accountability, trust in the system and learning from error; and three main frames that promote peer reporting: severity of incident or repeated errors by a healthcare professional, learning from errors, and anonymity. However, these were not found equally across the professions. Table 1 displays the frames as found through the interviews with physicians and nurses.

Enabling Frames of Self/Peer reporting			
		MD	R(P)N
Self Reporting Enablers	Professional Accountability		x
	Trusting Reporting System is Non- Punitive		x
	Learning from Error		x
Peer Reporting Enablers	Severity/Repeated Errors	x	x
	Learning from Error		x
	Anonymity		x

**Table 1 - Enabling frames of Self and Peer Reporting**

Physician reports were infrequent when it came to reporting on incidents in which the physician him/herself was involved. This was expressed by a Physician and Clinical Reviewer, who reviews a large number of incidents reported into the incident reporting system. When asked if events entered in the system by physicians were events in which others were involved, the Physician and Clinical Reviewer stated:

Oh versus what they [themselves] did? Yeah I think it's definitely related to something else that's happened somewhere. *(Physician and Clinical Reviewer 1)*  
 Do they enter their own issues? So if they miss something would they enter that? *(Interviewer)*  
 I've never seen one. *(Physician and Clinical Reviewer 1)*

Some physicians attempt to influence colleagues and residents to engage in self reporting but indicated that this is seldom practiced:

I've told the residents we should probably write up ourselves...we should write up our own events that have been caused by our care ... But I haven't seen many people writing that up... So I would say, just knowing how things work, people probably don't write up their own errors in there. *(Physician and Clinical Reviewer 3)*

In contrast to physicians, nurses engage more readily in self reporting. This was well illustrated in a quote from a Registered Nurse: "I've probably done more on myself than on other nurses" *(Registered Nurse 11)*. Nursing has a long history with reporting in this hospital, as does the profession. The frame of professional accountability in nursing, which

derives from training and from expectations set by the nursing regulatory college, was evident in many of the nurse interviews. Nurses may hold the belief that reporting is a professional obligation, mandated by the regulatory college.

If you make a mistake, it's self reporting, it's from College of Nurses. We need to do that, like it's mandatory for every nurse. *(Registered Nurse 10)*

...as a part of staying competent and avoiding ... either personal or a professional misconduct or abuse situations ... you would want to - as a part of your duties - to fill in this kind of thing. *(Registered Practical Nurse 2)*

In fact, nurses readily engage in encouraging other nurses to self report extending their frame of professional accountability to encompass other nurses who might not self report, as *Registered Nurse 9* stated: "Hopefully if a nurse has made an error you can encourage them to do self assessment, self reporting." Additionally, there is a belief held by some nurses that the voluntary incident reporting system is non-punitive. This reveals a frame consistent with the organizational message that reporting is non-punitive. These nurses felt secure in self reporting, and when directly questioned, expressed certainty that self reporting does not result in blame or reprimand.

I don't feel like if I did something bad and I wrote myself up that I'd be punished or anything for it. *(Registered Nurse 2)*

It's not really just about the nurses making errors ... it's not to blame me... it's not to kind of punish me in a way. *(Registered Practical Nurse 4)*

These nurses trusted the organizational messaging of no blame reporting, and seemingly did not feel threatened in reporting incidents. This frame is highly enabling, and aligns with larger organizational goals. Furthermore, many nurses believed that self reporting aided learning from the reported incident.

If I report a fall or I report medication being wrong we can look at that as more of a learning experience *(Registered Nurse 11)*

[My manager says] it's totally a learning thing, we're all human, we're all gonna make mistakes as long as we learn from it, that's the major thing. (*Registered Nurse 3*)

This learning frame is also highly enabling. This removes the stigma of reporting, as learning from one's incidents tends to frame reporting those incidents as part of a larger goal, of continuous improvement. If the learning experience frame could be held generally by front line workers, seemingly many of the barriers associated with self and peer reporting diminish in significance.

Some the frames enabling peer reporting behaviour differed from the frames underlying self reporting. Interviewees indicated that physicians might report peers more than they report themselves. A repeated errors/severity frame underpinned some peer reporting practices. Reporting a fellow physician is facilitated if the reporter believes the physician is a "bad apple".

I mean clearly if you know there's a doc who's a bad apple for example who always botches something, then I think I would have a lower threshold to bring it up or document it. (*Physician and Clinical Reviewer 1*)

Nurses also employed this frame of repeated error of a fellow nurse as serving as an incentive to report that fellow nurse.

You come in and you find out the same nurse is doing a near miss in a repetitive [fashion], then of course in my mind it's clear that you have to [report] it because they're missing something. (*Registered Nurse 9*)

Now I feel that if you don't report it then these errors that are being made the other nurse will never be aware of it. So she's not gonna learn from it. So I always make sure I report the situation. (*Registered Nurse 3*)

Additionally, practitioners will engage in peer reporting if the reporter determines the incident to be severe enough, indicating a severity threshold below which one would not report a peer.

Okay so you wouldn't write an incident report on another nurse? (*Interviewer*)  
[Only if] there was something really bad ... if there was a threat to the patient... it depends on the severity of the mistake. (*Registered Nurse 6*)

The frames enabling peer reporting diverge from here – no other frames enabling peer reporting amongst physicians were found. Nurses, however, have more complex frames that are employed enabling peer reporting.

In peer reporting, as in self reporting, some nurses spoke of the act of reporting as a way to learn about incidents and their causes, and as a way to help find solutions. The desire to learn from the error was the main attribute of this frame, which is effective at diverting attention from the individual reporting and reported on and focusing instead on how to prevent recurrence of the incident encountered.

Any error that your colleague makes if we're doing a very similar role... caring for the same patient, often if it happened to them, in my mind, it could very easily happen with me... I want to know what it was that happened and how we can all learn from this kind of thing. (*Registered Practical Nurse 2*)

If there's an error that happens [to your colleague] you can look at that and if there's a pattern then ... make solutions [to] prevent that from happening again (*Registered Nurse 9*)

The above frame facilitates not only peer reporting, but also self reporting for nurses. We noted that some of the nursing participants who spoke about trusting the incident reporting system not to be punitive, also spoke about the importance of reporting incidents for learning.

The anonymity frame that nurses hold also enables peer reporting. This refers to the ability to report a fellow nurse, but not name him/her in the incident report.

You can say you found patient on floor beside bed. Patient reported that he fell. So that's what I mean it's very objective but ... you don't try to place blame (*Registered Practical Nurse 1*)

Well I guess it's more or less anonymity, just anonymously. So it's not really going back to the person that's doing it (*Registered Nurse 11*)

The inspiration behind this may come from the training that the nurses receive “If it's happening to you, it's happening to other people” (*Educator 1*), which does not require the identity of the nurse involved in the incident to be revealed. Additionally, the message of not blaming one's colleagues has been communicated.

We keep saying that it's not punitive. We don't want to feel like the nurses are pointing fingers and that it's a learning process. (*Clinical Manager 2*)

In this way, nurses can report incidents without “pointing fingers” and consequently laying blame on a colleague. It is worth noting that all peer reporting enablers were restricted to one's workgroup – that is to say that physicians (rarely) peer report fellow physicians and nurses peer report fellow nurses. No frames that enable interprofessional peer reporting (physician reporting nurses, and vice-versa) were found.

### ***Inhibiting Frames of Self and Peer reporting***

The three main frames employed by frontline healthcare practitioners that serve as barriers to self reporting include: fear of blame, incompetence, and career progression; and the three main frames that inhibit peer reporting include: tattletale, locus of responsibility, and professional boundaries. These are depicted in Table 2.

Inhibiting Frames of Self/Peer Reporting			
		MD	R(P)N
Self Reporting Inhibitors	Fear of Blame	x	x
	Incompetence	x	x
	Career Progression	x	x
Peer Reporting Inhibitors	Avoiding Tattletale	x	x
	Outside Locus of Responsibility		x
	Professional Boundaries	x	x

**Table 2 – Inhibiting Frames of Self and Peer Reporting**

Fear of blame and being found at fault was pervasive amongst both physicians and nurses.

There’s a huge fear of blame and a huge culture of fear of being perceived as being incompetent. (*Resident 1*)

There’s a big culture among residents and med students and even staff I think there’s still a stigma of reporting things because people are worried about being reprimanded and punished (*Physician 2*)

I’m sure the manager would say like ‘oh this is non-punitive’... I made an [error in a previous position.] She raised her voice and was pretty much angry and it made me very nervous. I’m like, ‘Oh wow, can’t make mistakes here’. (*Registered Nurse 6*)

There would be a feeling of fault or backlash... like a punishment associated with it if it’s something that they feel could have been avoided. (*Registered Practical Nurse 2*)

The blame frame has been existent in medicine and healthcare generally for a long time, and this is what much of the work in patient safety has tried to address. Encouraging front line staff to report incidents without fear of punishment has been a significant challenge. As mentioned, this hospital had gone to some effort to dispel the idea that incident reports would be used to blame a practitioner, and yet these quotes demonstrate the frame of being blamed for reporting an incident is held very strongly by both physicians and nurses.

Personalizing an incident and framing it as a matter of incompetence is a major deterrent to self reporting. Resident 1 stated: “I think the perception is that when you report errors it’s not just the error that gets reported it’s the person who made the error.” Physicians’ fear for

one's reputation as a professional is prominent. Referring to such notions as "look(ing) like an idiot" and "personal screw up" is indicative of the tendency to personalize an incident. These notions also point to the stigma that physicians associate with being involved in incidents.

You don't want to disappoint your superiors, you don't want to disappoint the patient, you don't want to disappoint their family and you don't want to look like an idiot (*Resident 3*)

If you're reporting something that actually [indicated a] personal screw up ... I would say that probably people would think twice (*Physician and Clinical Reviewer 2*)

Nurses, like physicians, hold pride in their competence and skills, and fear for their reputation. They refer to the incompetence frame as an inhibitor to self-reporting.

I think it's a bit of a kind of knowing your colleagues might feel a certain way about you afterward if they figure out you did something or have an opinion about it and your reputation may be at stake. (*Registered Practical Nurse 2*)

Overall, framing incidents as a mark of personal failure is a barrier to self reporting, and one that patient safety has tried to combat. A powerful detractor is not only what the reporter thinks of him/herself, but also how he/she believes others will perceive the self.

Further, self reporting serving as an impediment to career progression is a frame shared both by younger physicians, residents, and nurses. The need to impress those who make decisions about job placements can act as a deterrent to self reporting:

In order to get into that area [the residents] need to be on their best behaviour and ...need to impress a certain staff physician in order to gain access to that area. And they feel as though if they were to do something by reporting an error that that would be looked upon as negative. (*Physician 2*)

(Some think) 'oh my God you made a medication error there's one x on your evaluation or on your file... The next x you're gonna lose your job.... There's still a lot of thinking about that. (*Registered Nurse 8*)

It is important to note that the fear of blame and incompetence frames that are held by physicians and nurses run counter to the formal views held at the institution. This is illustrated in the Chief of Internal Medicine's quote below, which acknowledges the frames generally held by physicians while indicating that the incident reporting system is not intended as punitive, but as a learning system:

I think docs in the hospital would just need to be constantly reminded ...that it's ... not a punitive system that someone's going to use to identify you as a problem person ... that it's really to learn and decide how we can make changes. But docs should know that - I mean we've been told that time and time again. (*Chief Physician*)

Similarly, the local nursing senior personnel (*Clinical Manager, Educator*) spoke about the non-punitive aspects of incident reporting.

It's not like I keep a running total of who has filled it out and who's made the error. So it's very non-punitive and it's really trying to just get everybody to understand that it really is to look at the systems. Because if you make a mistake most likely it's human error or there's some system in place that is just not working...I do believe it's just a culture that, when you made a mistake in the past that you felt that you were going to get in trouble. And now it's you make a mistake and what do we learn from that. But I think there still are people that are afraid to tell somebody they've made a mistake. (*Clinical Manager 1*)

So they don't always see it as something to look at the whole system, they look at it as a punitive thing, where part of my education to them is that it is to look at the whole system. Just because you gave the wrong med there could have been other factors involved that included other parts of the system causing that to happen. (*Educator 2*)

The fear of blame, incompetence and career progression frames are inhibitors to self reporting shared by both physicians and nurses, notwithstanding the organizational messaging aimed at alleviating these concerns.

In peer reporting, avoiding tattletale is a pervasive frame that is held by physicians and nurses. A resident described this perspective by saying "This is something that happened to other people ...you're sort of overseeing and watching what everybody else is doing... I feel

like it's a tattletale system" (*Resident 2*). Other quotes refer to the act of reporting as "squawking" on a colleague, which has a negative connotation and is something physicians would like to avoid.

Because even the other day when we were talking about ... how the patient didn't receive any emergency care and the team [said] "well we really don't want to report it because we don't want to ... report the emerg doc" (*Physician and Clinical Reviewer 3*)

I wouldn't want to squawk on a colleague right that did a procedure wrong or prescribed the wrong treatment - you know what I mean. (*Physician 3*)

Nurses had similar views regarding peer reporting, such as "They may think that they're like snitching" (*Registered Nurse 11*), and echo the physician held frame that reporting colleagues involves tattletale and going behind some's back:

Why would you hesitate about filling a report on somebody else? (*Interviewer*)  
I just keep on thinking that I am kind of going behind someone's back. That's why I don't like the idea. (*Registered Practical Nurse 4*)

If it was a medication error, some nurses get really offended if you [peer report]. They go 'oh she wrote me up' ... (*Registered Nurse 6*)

Framing the act of reporting a colleague as tattletale carries an underlying implication that reporting violates social conventions and therefore should be avoided.

Another inhibitor to peer reporting is the view that reporting on peers' incidents is outside an individual's locus of responsibility. This was frame was held by some of the nurses who indicated that nurse peer reporting is associated with disciplining, a role that is reserved for management:

It's not really up to me to discipline another nurse. It's not my job. (*Registered Nurse 7*)

I know that in certain cases ... writing an incident report... was seen more or less as a system of retribution from nurse to nurse. (*Educator 1*)

Another inhibiting frame relates to reporting on incidents in which a practitioner from a different profession is involved. This is the interprofessional boundary frame. In terms of physicians reporting nurses, there seemed to be an understanding among physicians of what nurses are responsible to report and physicians will generally not report what they believe to be nursing-related incidents.

It's kind of required, you know, like for them, because the nurses will administer the medications. (*Physician and Clinical Reviewer 2*)

We don't usually put a lot of things that are kind of nursing related. (*Physician and Clinical Reviewer 3*)

For the nurses, physician status plays an influential role, and has major implications for interprofessional reporting. As evidenced by the Chief of Internal Medicine,

[Nurses] should [report physicians] but I don't know if they do... but I can see there being a culture of feeling like they're tattletaling on doctors or maybe one of reprisal even though they're reassured that it's not working that way... I think doctors are seen as the ... moral and clinical leaders... It's part of that sort of hierarchy that they might be worried about doing that. (*Chief Physician*)

Furthermore, nurses stated not wanting to "go above" a staff physician, and focussing on correcting the problem as opposed to reporting physicians. They would call the physician or speak with other individuals (their managers or the pharmacist) to seek clarification. This frame of observance of social structures in a hospital is a deterrent to reporting these incidents.

If you had come across a short form in an order would you think of recording, putting that into the system? (*Interviewer*)

No not likely. I'd call the doc and just get a verbal order... or we'll ask the pharmacist. (*Registered Nurse 1*)

Interprofessional reporting is seen as an unfamiliar practice. A physician would not report nursing events and nurse educators were challenged to think that the incident reporting system would apply to professions outside nursing. This alludes to the long history of nurse reporting and fairly limited history of general internal medicine physician reporting, to the extent that reporting is seen by senior nurses to be restricted to the nursing domain.

I think that a lot of people don't even think of those as errors. So for instance if the physician wrote in the wrong chart they'll just call the physician. (*Educator 2*)

Maybe it's just not part of our culture... We're just so used to thinking of ourselves as a unit in terms of nursing practices and nursing processes and we're so used to dealing with issues within our own scope of practice that I don't think many people think of [incident reporting] as being a tool for physician improvement as well. (*Educator 1*)

Thus there is a strong tendency to stay within one's professional boundaries when it comes to peer reporting.

### **Discussion**

This study focused on specific aspects of reporting that have not received sufficient attention in the literature, namely the frames that are held by physicians and nurses with respect to self and peer reporting. The results show that some frames enable self and peer reporting, while other frames inhibit self-and peer reporting. Self and peer reporting behaviors are underpinned by these frames, which are derived from individual and socio-cultural experiences of front line workers. The results show variability in the views regarding self and peer reporting practices among physicians, among nurses, and across the two groups. In this section, we elaborate further on the origin and influence of frames, delve into the

differences between enabling and inhibiting frames, and compare the findings for the two professional groups.

Individuals use frames to understand their workplace settings<sup>23-25</sup>, and these can be informed by several factors that include past work experiences, training, socialization, profession, interactions, and group norms. Researchers have pointed to the prevalence of a variety of frames in organizations. For example, following Goffman<sup>52</sup>, Leonardi indicates that

frames demarcate a set of cultural resources that one will use to create schemata of interpretation that guide (one's) actions... The concept of frames helps to explain why groups of people who share access to the same toolkit of cultural resources might act and perceive the world in different ways.<sup>26</sup>

Similarly, in her empirical study, Chreim<sup>24</sup> found that individuals in the same organization hold or “appropriate” different frames, based in part on their own experiences, such as how they interface with a new technology. As one of the quotes we reported before illustrates, a nurse learned in an earlier experience that mistakes are not tolerated, and this underlies her holding a fear of blame frame. Our analysis also points to organizational messages related to learning, which found resonance among a number of the participants in the study. Thus, there are several individual and socio-cultural factors that help shape the frames that front line workers hold, and these frames influence their decision to report<sup>5,20</sup>.

The findings also show that there are similarities as well as differences in the frames held by the two professional groups. A look at Tables 1 and 2 indicates that the frames that are shared by physicians and nurses tend to be those that inhibit reporting, namely the fear of blame, incompetence, and concern for career frames when it comes to self reporting, and the tattletale frame when it comes to peer reporting. Nurses resolved the tattletale obstacle by reporting their colleagues anonymously.

It is important to note that a frame held by some of the practitioners – the learning frame – trumps the inhibitors to self and peer reporting. Viewing the objective of voluntary incident reporting as learning from errors allows practitioners to depersonalize incident reporting. The focus becomes how to prevent recurrence of incidents and not the individual reporting or reported on. In fact, it is the focus on the individual that underpins the fear of blame, the fear for one’s career and reputation, and the view that peer reporting is equivalent to tattletale. The prevalence of these views in health care settings has been well documented in the literature<sup>40,43,53–55</sup>. They appear to be culturally-ingrained beliefs that persist despite organizational and policy attempts to dispel fears. In a summary of various reports of a significant lapse in the NHS health care system in Mid Staffordshire, England, the National Advisory Group on the Safety of Patients in England (colloquially known as the “Berwick report”) states that achieving safety depends “on major cultural change” and that essential to this change is the need to “abandon blame as a tool”<sup>54 (p10-11)</sup>. In trying to address this well-known blame culture<sup>55,56</sup>, organizations espouse a just culture, although Weiner et al.<sup>57</sup> found that just culture<sup>58</sup> has been loosely defined for healthcare. In the case we studied, the general message accompanying the implementation of the voluntary incident reporting system was that it was intended as a learning system and not as a punitive system. The quotes we provided from physician and nurse leaders attest to this focus in the messaging. So what are the implications of these findings? We consider the implications in the next section.

## **Conclusion**

We would like to address the limitations of the study and implications for research and practice. In terms of limitations, it is worth repeating here that this study focused specifically

on self and peer reporting, to the exclusion of other aspects of patient safety views and practices. Another limitation is that this is a qualitative study that does not allow us to provide frequencies of views and frame occurrence in the site we studied. However, the strength of qualitative research lies in its ability to delve into and achieve an in-depth understanding of local contexts<sup>59,60</sup>. What is lost in terms of frequencies is gained in depth in understanding of the views that underlie decisions to self and peer report. The themes we elaborated on here can be tested in survey studies that would provide information on the prevalence of frames underlying the decision to self and peer report. In addition, this study was undertaken in one hospital department, which limits the generalizability of the study. However, as numerous methodologists have pointed out, the strength of case study research lies not in its generalizability to a population, but in the thick, rich descriptions of the dynamics present at the site studied<sup>59-62</sup>. Thus, qualitative researchers provide information on the site studied and extensive quotations that allow the reader to determine transferability of the findings to different contexts.

What are the implications of our findings that reporting practices are underpinned by deep-seated views and beliefs deriving from individual experiences and group interactions and norms? It can be said that ingraining the practice of incident reporting and making it a prevalent and relatively invariable practice within and across professions requires intensive investment in education and training, as well as demonstrating the systemic benefits of reporting while exercising vigilance to avoid the punitive side. These are lengthy processes. Persistent communication about systems benefits and non-punitive aspects of incident reporting is needed but is not sufficient. This communication should be consistent with practices at the local levels – where group culture and norms have a major influence on

individual views and practices. As Hor et al.<sup>5</sup> point out, incident reporting mechanisms and accountabilities must be woven into the local cultural context to be effective. Approaches used for ingraining new beliefs and practices have followed the principles laid out by Kurt Lewin<sup>63</sup>, who proposed the importance of considering the individual as well as the group in efforts aimed at change. Schein, whose work builds on Lewin's, points out that for lasting change to occur, it is best to provide training to the whole group in such a way as to allow the group members to reveal their views, and then to introduce “collectively a new set of standards for judging”<sup>64 (p34)</sup> what is acceptable belief and behavior. In other words, it is important that the collective understand the value of peer and self reporting and that it appropriate the frames that enable these behaviors.

In conclusion, health systems and hospitals should consider the various frames that enable and inhibit self and peer reporting among different professional groups when trying to improve the quality of information derived from incident reporting systems. Increased attention to group norms and local contexts would enhance patient safety initiatives such as incident reporting systems.

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## Manuscript #2 - Fix and Forget or Fix and Report

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**Manuscript title**

Fix and Forget or Fix and Report: A Qualitative Study of Tensions at the Front Line of Incident Reporting

## ABSTRACT

**Introduction:** Practitioners frequently encounter safety problems that they themselves can resolve on the spot. We ask: when faced with such a problem, do practitioners fix it in the moment and forget about it, or do they fix it in the moment and report it? We consider factors underlying these two approaches.

**Methods:** We used a qualitative case study design employing in-depth interviews with 40 healthcare practitioners in a tertiary care hospital in Ontario, Canada. We conducted a thematic analysis, and compared the findings with the literature.

**Results:** ‘Fixing and forgetting’ was the main choice that most practitioners made in situations where they faced problems that they themselves could resolve. These situations included (A) handling near misses, which were seen as unworthy of reporting since they did not result in actual harm to the patient, (B) prioritising solving individual patients’ safety problems, which were viewed as unique or one-time events, and (C) encountering re-occurring safety problems, which were framed as inevitable, routine events. In only a few instances was ‘fixing and reporting’ mentioned as a way that the providers dealt with problems that they could resolve.

**Conclusion:** We found that generally health care providers do not prioritise reporting if a safety problem is fixed. We argue that fixing and forgetting patient safety problems encountered may not serve patient safety as well as fixing and reporting. The latter approach aligns with recent calls for patient safety to be more preventive. We consider implications for practice.

## Fix and Forget or Fix and Report:

### A Qualitative Study of Tensions at the Front Line of Incident Reporting

#### **INTRODUCTION**

Voluntary incident reporting systems have been recommended by various bodies as a way to improve patient safety(1–4). Yet, incident reporting systems are complex socio-technical systems(5,6) that have come under intense scrutiny(7–11); they have been both criticised(12–14) and praised (15–17). One of the main objectives of incident reporting systems is to attain organisational learning(1,18). This learning is restricted if only realised incidents are reported, but it could be greatly enhanced if patient safety hazards (defined as conditions that could lead to patient harm) are reported as well(19,20). While many studies have researched obstacles to and enablers of incident reporting by frontline healthcare workers, this study focuses on a specific but significant type of information – problems that the practitioners themselves can typically resolve. Few studies have looked at the goal conflict associated with the decision made at the front end of fixing an encountered patient safety problem on the spot and forgetting about it, or fixing the problem and reporting it into a reporting system. For example, a practitioner is about to administer medication to a patient, when s/he realises that the dosage by far exceeds what is recommended. The practitioner has two options: (1) seek clarification and change the dosage, administer the proper medication, move on to other tasks, and forego incident reporting, or (2) seek clarification and change the dosage, administer the proper medication, and fill out an incident report.

Several conceptualisations of what constitutes an incident have been suggested(21–23). The Canadian Patient Safety Institute (CPSI) presents three types of incidents: a harmful incident (reached the patient, and harm resulted – typically well accepted in healthcare under various terms such as ‘adverse events’, ‘sentinel events’ and ‘critical incidents’)(ref. 24, p.9), a no-harm incident (reached the patient, but no discernible harm resulted), and a near miss (did not reach the patient). Given that all of these deserve analysis, it can be argued that they should be reported into a reporting system. The WHO’s Patient Safety Curriculum Guide expects multi-disciplinary learners to acquire competencies in adverse events and near misses(25). Franklin et al. note that “If incident reporting systems include and encourage reports of no-harm incidents in addition to actual patient harm, they can facilitate monitoring the resilience of healthcare processes”(ref 19, p.765). The Health Foundation’s The Measurement and Monitoring of Safety states “The focus is moving from counting harms after the event towards looking at hazards that might give rise to error, or safety failure before harm has occurred”(ref 26, p.iii). Overall, while historically adverse events were the main focus of hospital reporting systems, near misses and hazards may also be expected in patient safety reporting, thus requiring practitioners to attend to this dimension of their work.

At a cognitive level, Tucker and Edmondson(27–29) studied health care practitioners’ first order problem solving (fixing the problem at hand) and second order problem solving (understanding why the problem exists, aiming to correct the drivers, and thereby enhancing organisational learning). This study extends Tucker and Edmondson’s work by viewing their concepts as applied to a reporting system, specifically first order problem solving represented as fixing a safety problem in the moment and forgetting about it, and second order problem solving represented as fixing the problem in the moment and reporting it so

that wider learning can occur. The choice between these two options may be done more or less purposefully, as we demonstrate in this paper. Regardless, the two options are faced on a regular basis, and are underpinned by competing organisational priorities that require both providing effective, expedient care to as many patients who need that care, and investing effort to create awareness of hazards and incidents. Given that frontline workers tend to be in an excellent position to identify safety problems and that they can play an important role in enhancing organisational learning(28), we ask: How do frontline healthcare practitioners choose between a) fixing a patient safety problem and forgetting about it, and b) fixing the problem and reporting it into an incident reporting system?

## **METHODS**

This study is part of a larger research project on voluntary incident reporting and safety in a teaching hospital in Ontario, Canada. The reporting system at the hospital is available to employees through any networked device. The reporter enters information using the patient's medical record number and provides a narrative describing the patient safety incident (see the CPSI definition above) using facts. The reports are reviewed by Clinical Managers who investigate them locally, by physician Clinical Reviewers who assess if harm was caused to the patient, and by Core Reviewers who assess larger hospital issues.

Our study focused on General Internal Medicine – one of the largest departments in the hospital. The study began in spring 2012, with a quality review meeting whereby the researchers were introduced to key personnel who would later become interviewees. Over 5

months, two researchers (both independently and together) confidentially interviewed hospital personnel. The Chief Physician and Clinical Director were key informants, each of whom recommended other personnel to interview based on our request to sample individuals with a variety of views and practices related to incident reporting. This process yielded 26 interviews purposefully sampled. Additional interviewees were recruited through email requests for practitioners to participate in the study. Overall, 40 participants were recruited as shown in Table 1.

<b>Job title</b>	<b>Number of participants</b>
Clinical Director	1
Physicians (Chief Physician, Clinical Observer, Clinical Reviewers, Physicians)	8
Residents	3
Clinical Managers, Nurse Educators	4
Registered Nurses, Registered Practical Nurses	15
Clerks, Orderlies	3
Physiotherapists	3
Pharmacy (Pharmacist, Drug Distribution Supervisor, Pharmacy Technician)	3
<b>Total</b>	<b>40</b>

**Table 1 - Number of interviewees by job title**

The interview included questions about reporting, non-reporting, and safety practices. Interviews averaged 45 min, and were digitally recorded and transcribed. Data analysis was undertaken by two researchers who met to discuss the themes in the interviews and the derivation of codes based on the data gathered. Atlas ti software (GmbH, Berlin, Germany) was used to code the interviews and retrieve quotations. The analysis involved both a deductive and inductive approach(30). Through a reading of the literature, we were informed about concepts and approaches related to incident reporting systems and patient safety (deductive approach). Our analysis of the data revealed local practices related to the use of the incident reporting system (inductive approach). Through an iterative process of

moving between the literature and the data, we identified three themes pertaining to how patient safety problems that health care practitioners can solve are handled with respect to reporting.

## **RESULTS**

The Canadian tertiary care hospital where this voluntary incident reporting system was in place had instructions on the types of events expected to be entered: a ‘patient safety event’ is ‘Any circumstance where a patient experiences harm, or potential harm, due to medical care’ (Hospital literature). This is a broad statement; leaders refined and defined expectations regarding incident reporting, but these expectations were not always met by practitioners. A nursing leader described two different ways that events might be dealt with:

We had dry alcohol swabs... So nurses would go ‘oh dry, dry, dry’, they’d go through 5-6 dry ones, get a wet one, and move on with their day. Finally somebody comes to me and says ‘why are all of our alcohol swabs coming up dry?’... So it takes that initiative. Some nurses have that initiative ... they think about systems. Others think about moments, ‘this is an issue right now, this is something I can deal with...’ not ‘oh I think the hospital needs to know that this isn’t working’. (*Educator 1*)

In the situation where the nurse opens alcohol swabs that are dry, and continues to do so until finding a wet one, the nurse is ‘fixing and forgetting’. The goal of getting a wet alcohol swab was reached – the nurse fixed the problem - so work can continue. However, the nurse who questions why there were dry swabs is ‘fixing and reporting’. The nurse fixed the problem – getting the wet alcohol swab as well - but ensured that the problem was reported before attending to the next task. The report allowed an investigation and went beyond only tending to the immediate problem at hand. This illustrates a situation that healthcare practitioners can address, followed by their choice to report or not to report, which is the

subject of our study. We examine the context surrounding practitioners' decision to 'fix and forget' or 'fix and report'. Through this analysis, we revealed three themes: handling near misses, fixing individual patients' safety problems, and adapting to imperfections.

### **Handling near misses**

Near misses have various definitions(23,24), but in all these definitions, the incident has not been realised – some intervention prevented the near miss from progressing to a harmful incident. Some near misses, if reported, would overwhelm the practitioners:

You have a crazy shift... Somebody has turned around and quickly they grab an IV fluid, they go to hang it, they realise it's in their hand and say 'oh it's the wrong one' and they go put it back. I basically have been told that that's a near miss, you should be doing an incident report. But we would drown in paperwork if we did that, right? (*Registered Nurse 9*)

The main issue here was that reporting this type of near miss would create overburdening paperwork, and the subtext of the patient not being harmed helped justify the decision to 'fix and forget'. In this case, putting the incorrect intravenous fluid back and getting the right intravenous fluid for the patient's need, and continuing on with various tasks was prioritised, without reporting the near miss. However, near misses were not reported for other reasons as well.

If the physician wrote in the wrong chart they [nurses] will just call the physician up and say 'hey you wrote the order in the wrong chart come and write it in the right chart' ... They wouldn't fill out an incident report unless something had happened because of an order being written wrong... If they had a chance to fix it, it's not considered a near miss. Like I said, most near misses are not reported... there's no agreement on what constitutes a near miss. (*Educator 2*)

What constituted a near miss was poorly understood, and there was general agreement that they were underreported. Generally, the view was that if a problem had not progressed to

the patient (CPSI near miss), there would be no need to report. The potential for harm to the patient notwithstanding, the patient was not harmed, so ‘fixing and forgetting’ as opposed to ‘fixing and reporting’ was how near misses were generally handled.

However, some did recognise that near misses were worth reporting:

*(Interviewer)* Would you fill out [an incident report] for a dose that’s a hundred times too high on the prescription and you got it clarified down to what it should have been?

*(Registered Practical Nurse 2)* I should, yeah, that would be a near miss type thing, because it never got given but it had the potential to be harmful.

This nurse considered that the potential for harm was a trigger to writing an incident report, and in contrast to his/her colleagues, engaged in ‘fixing and reporting’.

### **Fixing individual patients’ safety problems**

Healthcare providers prioritise caring for individual patients, and if a problem occurs, providers tend to treat the situation as ‘a one-off’, or ‘a one-time’ event. Hazards are conditions or situations that could cause harm, but if the patient was not harmed, the situation was seen as not worth reporting. A prescription or order was ambiguous, but instead of viewing this as a problem worthy of reporting, the nurse got clarification so that the proper drugs were administered to his/her patient, and did not subsequently fill an incident report.

Anything that adversely affects my patient is an incident report ... If there’s a potential, it becomes more of a judgement thing ... ‘If we can fix it, don’t report it’ type idea... A doctor writes an order, I don’t understand what they’ve [written], I call the doctor and say ‘what was the dosage...’ They tell me. It hasn’t affected my patient .... If there wasn’t any effect on the patient – I fixed the problem – so I don’t do an incident report. *(Registered Nurse 9)*

This quote demonstrates two concepts – severity determining reporting, as well as responsibility towards an assigned patient. This nurse was certain that an incident that affects the patient is worthy of reporting (a CPSI harmful incident), but if a situation is fixed, the severity would decrease, and there would be no need to report. Additionally, the quote illustrates the responsibility felt towards assigned patients (‘my’ patient) and the desire to fix problems for individuals under a provider’s direct care. An incident report would have little effect on an individual patient, so ‘fixing and forgetting’ was seen as far more aligned with what the healthcare provider believed to be his or her role. In a different scenario, where a patient was affected (a CPSI no harm incident), an incident report was not thought to be important.

[The nurses] called me [and] we fixed the situation - we checked [the patient’s] blood sugars and everything was fine ... Because the mistake was recognised early and because the appropriate recourses were taken, it wasn’t something that needed to be reported. (*Resident 2*)

In this case, short acting insulin had been injected instead of the intended long acting insulin, but the healthcare team realised it early enough to prevent any serious harm to the patient. The reactive response of the healthcare providers was considered appropriate, and ‘everything was fine’ for this patient; an incident report was seen not to be necessary. This is in contrast to one interviewee, who noted:

[We should report] having two patients side by side with the exact same last name - which I have seen multiple times - you’re asking for error to happen. (*Physician 2*)

This physician talked of a hazard that can affect more patients than just an individual patient assigned to a practitioner as being worthy of reporting since the possibility of causing an incident is foreseeable. Reporting a hazard aligns with the hospital’s expectation of reporting, “A circumstance where a patient experiences potential harm due to medical care”

(hospital literature). This is a case that is closer to ‘fixing and reporting’. It should be noted, however, that most interviewees espoused the ‘fix and forget’ option and only a few spoke about reporting hazards.

### **Adapting to imperfections**

Fixes, or adapting to unfixed problems, can become routinised normal work, and may not be noticed any longer. The extract below followed a discussion that only major events would be reported.

*(Interviewer)* So [a patient whose paperwork wasn’t complete], staying for the extra 2 days of the weekend isn’t major?

*(Physician 3)* Happens all the time. There’s delays. My day is chock a block full of dealing with these sort of things as well as trying to take care of patients and do other duties... They’re just things that occur day-to-day, that have always sort of occurred day-to-day in various different ways. That is part of the practice of medicine in a big large teaching hospital.

The sense of inevitability of ‘these sorts of things’ is evident in stating the daily occurrence of seemingly minor problems that this practitioner needed to deal with to attend to patients and other duties. Reporting these problems, although identified as potentially harmful to patients, was not undertaken – was not considered. Rather, practitioners adapted to these seemingly minor issues and considered these as routine occurrences.

*(Resident 1)* [Requisitions] get lost all the time and that’s never reported.

*(Interviewer)* And it’s not reported?

*(Resident 1)* Oh no. Everybody agrees that there’s probably some black box ...where all these radiology reqs that have been lost - that happens all the time... They say ‘oh well we never got the fax’... And that never gets reported, and it delayed treatment or delayed assessment.

Here, although the potential for harm was acknowledged by the provider, the problem was not reported – rather the resident (and other practitioners) adapted to the frequent loss of

requisitions and delayed assessments. Engaging in work-arounds, such as hand delivering a requisition, became a routinised practice that escaped attention as a problem to be reported.

In short, ‘fixing and forgetting’ was the main choice that most practitioners made in situations where they faced problems that they themselves could resolve. These situations included (A) handling near misses, which were seen as unworthy of reporting since they did not result in actual harm to the patient, (B) prioritising solving individual patients’ safety problems, which were viewed as unique or one-time events, and (C) encountering re-occurring safety problems, which were framed as inevitable, routine events.

## **DISCUSSION**

This study looked at specific encounters with hazards and problems where a healthcare practitioner might either fix the problem and move on, or fix the problem and report it into the reporting system. We identified three themes: handling near misses, fixing individual patients’ safety problems, and adapting to imperfections. In these scenarios, the practitioners nearly always chose to fix and forget – or to engage in first order problem solving. It is worth reflecting here on Tucker and Edmondson’s study, where they found that “on average, 33 min were lost per 8 hour shift due to coping with system failures that could have been addressed and removed”(ref, 27 p.60). These different types of problems that practitioners fix and forget are not only lost to organisational learning, and may be costing them time as well in their work-arounds. Choosing to be efficient in the moment may ironically cause the front line providers to be far less efficient over time than intended.

One of the problems was near misses. Near misses in our study were poorly understood – a common occurrence in other healthcare contexts. Kessels-Habraken et al.(23) argued that

healthcare has focused more on incidents that did reach the patient but did not cause harm (CPSI no harm incident – the insulin example in this study) than incidents that did not reach the patient (CPSI near miss – ambiguous prescription example in this study). Kessels-Habraken et al. indicate that due to this focus, “valuable safety-related information about successful error recovery mechanisms remains unavailable or gets lost”(ref 23, p.1302). Other healthcare studies have shown near misses not being tapped for their potential. Mattioli et al.(31) noted a preference for reporting incidents causing harm over near miss reporting in a paediatric surgical department. Jeffs et al.(32) also found that near misses generate three typical responses: doing a quick fix and nothing else (‘fixing and forgetting’ in our study), which was the most frequent response, and two types of ‘fixing and reporting’, whereby the report falls into a black hole, or is used as a catalyst for organisational change. In transportation, accident investigation crews examine crash sites extensively to find out why the crash occurred and how to prevent it in the future. They thus generate lessons for the industry, but only after lives have been lost in the crash. Alternately, near misses are seen as ‘free lessons’ where learning can occur, but without any deaths(33). Burnett, Carthey and Vincent stated that high risk industries have shifted from focusing attention on incidents and realisation of harm to hazards and conditions that create safety(26). In healthcare, Schildmeijer et al. recommend that random chart reviews be undertaken to find no-harm incidents(34), although this view is not unanimous(35). Franklin et al.(ref 19, p.770) state that “The challenge, across all areas of harm, is now to create and use data on... low-harm occurrences to test the resilience of safety practices and systems”.

Fixing an individual patient’s safety problem is common. As mentioned, healthcare providers often personalise the assignment of patients to them, and the care given (including

fixing problems) to ‘my’ patient is then a source of professional pride and responsibility. Jeffs et al. noted a physician stating “part of what we pride ourselves in is to be able to get ourselves out of tricky situations”(32). This professional pride in fixing problems is common to many front line workers, including in rail(36), and nursing(28). Practitioners view their ability to solve problems “... as a strong sign of their expertise and competence”(37 p101). Fixing problems that would otherwise harm that patient (to the exclusion of reporting the hazard) is common. However, as Jeffs et al(32) point out “As a result of such unreported quick-fix scenarios, learning remained local and confined to the individual level. Notably, learning is limited to the individual who initiated the fix.” Haradan adds(38 p2) “We fix it for that particular person or family and the immediate surgical team involved learns, which is very important, but what about preventing such errors from happening to anyone else?” Tucker and Edmondson(27) note that nurses are encouraged to use vigilance to solve problems to the detriment of organisational improvement. This aligns directly with first order problem solving (fixing and forgetting), to the exclusion of second order problem solving (fixing and reporting)(27–29). In fixing and reporting, the lessons are disseminated beyond the local circumstance of the individual patient, and can benefit far more patients as a result.

It is worth noting that opting to report or not to report is not always a purposeful decision. For example, if fixing and forgetting becomes the norm, adapting to imperfections will follow, and the need to report hazards or problems will escape attention. Waring writes “the inevitability of error leads to more than acceptance [of errors], but also to their ‘normalisation’. This is where some common mistakes are regarded as routine and normal within the context of medical work, and in consequence these events are not perceived as

problematic or worth reporting”(ref 6, pp.1931-1932). Dekker explains Vaughan’s influential term coined through her study of the Challenger launch decision: “The ‘normalisation of deviance’ describes a process whereby a group’s construction of risk can persist even in the face of continued (and worsening) signals of potential danger...Small departures from an earlier established norm are often not worth remarking or reporting on”(ref 39, p.538). Thinking of imperfections as routine occurrences could result in hazards or safety problems never being reported.

However, not all healthcare practitioners are blind to the imperfections. Tucker and Edmondson describe a desirable employee as a “disruptive questioner who will not leave well enough alone. The person is constantly questioning, rather than accepting and committed to, current practices”(ref 27, p.68). The success of the Central Line Blood Stream Infection or CLABSI initiative in the USA(40) – an excellent example of a patient safety intervention – began with a physician challenging the status quo, or the inevitability of error. Reporting problems can save front line healthcare workers from encountering the same incident repeatedly, or engaging in work-arounds that reinforce working with an imperfect system(27). Even in our study, a nurse saw the potential for patient harm through an order clarification, and a physician found two patients with the same last name in close proximity troubling, and both deemed the situation worthy of fixing and reporting.

At this point, one might ask whether it is worth reporting all realised incidents and all potential incidents. Might this not result in costly and far too many reports, both for the reporters(41), and those who analyse the reports(20,42)? And more importantly, would such

reporting yield safety benefits? For example, it has been pointed out that most events that are entered into reporting systems, such as patient falls, “provide little incremental value about the insight of safety systems... questioning the benefit of having the user report them in the first place”(ref 20, p.155). In contrast, other studies(43) have looked at patient falls with an aim to get more of them reported. Importantly, most studies suggest that better criteria should be set to guide practitioners about what and how to report. Additionally, “both operational ‘know how’ and conceptual ‘know why’” are important for frontline engagement in quality improvement projects(20, p.125). Certainly the most serious harm to patients is dealt with expediently using hospital processes of risk management and senior personnel(42–44), often followed by extensive investigations. Equally important, however, is giving consideration to reporting near misses and hazards, and using them as the focus of investigation and intervention. This would enable investigations to have a preventive (and not only a reactive) approach to patient safety(44).

### **Limitations**

This study has limitations. The focus on the fixable types of problems is to the exclusion of other types of reports that healthcare professionals write. Further, this study was undertaken in one hospital department, and may not be generalisable to other departments. However, the results concerning the underreporting of near miss incidents have been found in other studies of hospital departments, notably pediatric surgery(31), pediatric ICU(45), radiation oncology(46,47), emergency(48), and surgery(49,50). In addition, it should be noted that the strength of qualitative studies lies not in generalisability, but in the ability to provide an in-depth view of micro dynamics present in sites(51). In fact, findings from qualitative studies

can be transferred to other contexts that are similar to the one studied(30). The quotes and interpretation should serve to illuminate the context sufficiently to allow the reader to assess if the findings of this study are transferable to other contexts.

## **CONCLUSION**

This study investigated a particular type of possible report – a problem that the practitioners themselves can typically resolve – and looked at their choice between ‘fixing and forgetting’ and ‘fixing and reporting’. In considering the themes of handling near misses, fixing individual patients’ safety problems, and adapting to imperfections, we found that generally health care providers do not prioritize reporting if a situation is fixed. This suggests a number of practice recommendations. ‘Fixing and forgetting’ could engender normalisation as exceptions become the norm, but recognition of hazards and problems may help healthcare guard against normalising deviance, and may help improve patient safety by focussing on a more preventive approach. Communication and training on what should be reported, why and how should be considered more carefully. Further, recognising the ‘disruptive questioner’(27) as a desirable employee would be one step towards encouraging this new approach. Finding individuals who ‘fix and report’, enabling them to share their reporting approach with their colleagues, and recognising their efforts would underlie informal training that could result in more healthcare workers fixing and reporting hazards and problems, and help organisational learning that improves patient safety.

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### **Manuscript #3 – Double Checking**

This manuscript has been reviewed and invited to be revised and resubmitted to the Journal of Evaluation and Clinical Practice. Attached is the first version (pre-revision).

**Manuscript title:**

Double Checking – A Second Look

## ABSTRACT

**Rationale, aims and objectives:** Double checking is a standard practice in many areas of healthcare, notwithstanding the lack of evidence supporting its efficacy. We ask in this study: “What are the weaknesses of double checking? What alternate views of double checking could render it a more robust process?”

**Method:** A qualitative study based on 85 semi structured interviews of healthcare practitioners in General Internal Medicine and Obstetrics and Neonatology; thematic analysis of the transcribed interviews. Inductive and deductive themes are reported.

**Results:** Weaknesses in the double checking process include: Double checking trusted as an independent process, Double (or more) checking as a costly and time consuming procedure, and Double checking as preventing reporting of near misses. Alternate views of double checking that would render it a more robust process include : Recognizing that double checking requires training and a dedicated environment, Introducing automated double checking, and Expanding double checking beyond error detection.

**Conclusion(s):** Double checking deserves more questioning, as there are limitations to the process. Practitioners could view double checking through alternate lenses, and thus help strengthen this ubiquitous practice that is rarely challenged.

## Double Checking – A Second Look

“When it comes to everything, everything is always double checked. So I’d say we’re pretty safe.” (*Nursing Manager*)

### **Introduction**

Double checking is a standard practice intended to improve patient safety. It is used in different areas of healthcare, such as medication administration (1–4), and radiotherapy (5,6). The confidence in double checking exists in spite of the lack of evidence substantiating its effectiveness. Alsulami, Choonara and Conroy (7) undertook a systematic review of double checking and found that there is a paucity of evidence, particularly randomized controlled trials, to justify the practice of double checking. Leape had identified double checking as a “sacred cow” that “zaps time and is ineffective” (8 p513).

Patient deaths have been attributed in part to a failed double checking process (9–11). The Institute for Safe Medication Practices Canada (ISMP) published instructions on how to undertake an independent double check (12), and the American parent ISMP later published a bulletin (13) to further clarify independent double checks. The ISMP highlights that double checking has been critiqued for: the increased workload it brings in time pressured environments; the variability in double checking practice resulting in errors not being found; and the difficulty in finding errors through double checking when the error rate is very low (12). This Institute maintains that double checking is effective, but only if it is a true independent double check, and only if it is sparingly used. Furthermore, double checking as a patient safety tool is recognized as being only moderately effective. The Canadian Patient Safety Institute (CPSI) ranks interventions on a Hierarchy of Effectiveness. Ranked highest are corrective actions that include physical changes and computerization, whereas double checking is on a lower tier of effectiveness (14 p57). A separate CPSI study noted that mandating double checking without understanding its process “has created a false sense of

security in our healthcare system” (15 p11). Additionally, a study in 2014 revealed that double check compliance is variable (16). In a study of UK children’s hospitals, Conroy, Davar and Jones (3) concluded that “the practice of double checking is largely based on what seems to be common sense” (p. 24). Paparella noted “Studies on the nature and value of an independent double check in today’s health care environment in light of added technologies would be a welcome addition to the safety literature”(17 p 631).

We ask “What are the weaknesses in the double checking process? What are alternative ways to view and practice double checking in order to enhance patient safety?” The study adds to the literature by further examining the limitations of the double checking process, proposing alternate views of double checking to help enhance patient safety, and providing theoretical background to these issues.

## **Methods**

This qualitative study focused on voluntary incident reporting and patient safety in a multi-campus teaching hospital in Ontario, Canada. In semi-structured interviews, participants spoke of double checking as a patient safety practice, and this data forms the backbone of this paper. Data collection was undertaken in General Internal Medicine (GIM) and Obstetrics and Neonatology (OBS/NEO) between spring 2012 and fall 2014. Our data collection in each department started with our attending a quality review meeting where the researchers were introduced to key personnel who would later become interviewees. These key informants helped us extend our sample by contacting managers and practitioners. Over a period of five months in each division, two researchers (both independently and together) confidentially interviewed eighty-five participants, as shown in the table below.

<b>Job Category GIM</b>		<b>Job Category OBS/NEO</b>	
Physicians	<b>11</b>	Physicians	<b>8</b>
Nurse Managers	<b>5</b>	Nurse Managers	<b>15</b>
Bedside Nurses	<b>15</b>	Bedside Nurses	<b>15</b>
Pharmacy	<b>3</b>	Midwives	<b>3</b>
Physiotherapists	<b>3</b>	Respiratory Therapy	<b>4</b>
Nursing Support	<b>3</b>		
<b>Total</b>	<b>40</b>	<b>Total</b>	<b>45</b>

**Table 1 - Interviewees by Generic Job Title**

This study underwent ethics review at both the hospital site of the case study, and the researchers’ university. Interviews lasted about 45 minutes, and were captured on a digital voice recorder and transcribed verbatim. Atlas ti software (GmbH, Berlin, Germany) was used to code the interviews and retrieve quotations. We undertook data analysis by discussing the themes in the interviews and the code derivation based on the data. The analytical approach was both inductive and deductive (18). The first three themes presented were inductively derived (informed principally by the data), whereas the second three themes were deductively derived (indications in the data were further developed based on extant literature). Iteratively moving between the data and the literature, we identified themes of weaknesses in and alternative views of the double checking practice.

## **Results**

The analysis we conducted concentrated on two broad themes with respect to double checking: weaknesses in the double checking process, as well as alternative ways to view the practice. The sub themes under weaknesses are *Double checking trusted as an independent process*, *Double (or more) checking as a costly and time consuming procedure*, and *Double checking as preventing reporting of near misses*. Sub themes under alternate views of double checking include *Recognizing that double checking requires training and a dedicated*

*environment, Introducing automated double checking, and Expanding double checking beyond error detection.*

### **Weaknesses in Double Checking**

These themes were informed by the data, and as such were inductively derived.

#### Double checking trusted as an independent process

Participants often referred to double checking as a standard institutional procedure.

So the double checking of medications for example is a standard practice  
(*OBS/NEO Nursing Manager 1*)

So the specifics they put in [after a catastrophic event] was basically double checking, like having 2 nurses checking things. (*GIM Bedside Nurse 13*)

It was viewed as a process that could be relied upon to find mistakes.

They'll say "can you check this medication" and then the nurse will double check it and it's not the right thing or it's not what like the nurse is saying it is. "So you almost gave this - good thing you double checked". (*OBS/NEO Bedside Nurse 7*)

We already have two nurses check the milk before you give it to the baby so ...we have something in place to mitigate that risk. (*OBS/NEO Bedside Nurse 11*)

We have the double checking system so that's what we do - so the mistakes are found. (*OBS/NEO Bedside Nurse 13*)

The trust in the double checking process was evident – it was often used on its own as a procedure to assure safety. Sometimes the nursing managers needed to “reinforce the rules about double checking” (*OBS/NEO Nursing Manager 1*), as a nurse who did not follow the double checking process would be seen to be at fault. Reliance on double checking was well entrenched not only in nursing and pharmacy, but also among physicians.

Obviously we put upon ourselves the expectation that we've done our best, double checked our orders ... but at the same time we do realize that mistakes are gonna happen and hopefully somebody else will catch them before they reach the patient. (*GIM Physician 10*)

If I had a little more support for the last 30 hours or if I wasn't as tired, then the mistake may not have happened, or if there was some other sort of double check system in place for whatever had happened. (*GIM Physician 11*)

These quotes indicate that the physicians trusted that double checking would have caught problems that they might have missed. Generally, double checking was seen as sound as an independent process, and as guarding against patients being subjected to mistakes. The view here was that errors would be identified in the double checking process.

#### Double (or more) checking as a costly and time consuming procedure

In some situations, double checks were seen as insufficient, and additional checks were added.

We double check [breast milk]; I know we've added a third check, just to make sure any mistakes don't happen. (*OBS/NEO Bedside Nurse 9*)

Some practitioners, when asked about patient safety, were not convinced that double checks were good enough.

Medications are lost, the orders aren't transcribed, they've missed this one, even though they've signed it off, it hasn't been transcribed here, and so there's a double check, a triple check, the pharmacy checks. So I mean they built in double checks for many of these things, but often double checking is not enough, you need a triple or quadruple. (*GIM Physician 2*)

However all these checks came at a cost.

I know this is terrible to say, but it almost increases the work that we have to do because now, all of a sudden, we have to find two people to co-sign the breast milk syringes, whereas before we weren't doing that, we were just showing the bottle to somebody and then giving the milk. So now all of a sudden we have to hunt down people, have them co-sign it, it's a pain for them, it's a pain for us. (*OBS/NEO Bedside Nurse 12*)

The above nurse recognized that while the double checking protocol was well intended, it substantially impacted nursing daily work, whether one was the nurse

looking for someone to double check, or the nurse being sought to double (or triple) check. Furthermore, the ability to perform an independent double check could be very difficult in a busy environment, despite best efforts to block time for checking.

So I blocked off certain days that I would just be checking so I was in the area. I was doing my checking function of all the drugs going to the patients - there was quite a lot of noise and I was interrupted every 5 minutes for about half an hour so I kept having to stop, give my input, and then start again. And I still made a mistake ... (*GIM Pharmacy 2*)

These checks were not infallible.

Do errors still happen, yes. "Baby Smith, baby Jones, baby Smith/baby Jones. Okay I'll sign it in a minute", and they take baby Smith's and baby Jones' and then baby Jones gets baby Smiths' ... Why? Because they're busy, because they're trying to save time, because they've got way too much to do. (*OBS/NEO Nursing Manager 3*)

Heavy workload, coupled with the problem of finding both time and a quiet environment in which to concentrate implied that the introduction of a double (or higher) check may not have resulted in a robust patient safety tool.

#### Double checking as preventing reporting of near misses

A near miss is a problem that is caught and stopped before it causes harm. Double checking is an intervention that can catch problems before they cause harm to the patient, and as such often prevents the reporting of near misses.

So that's a near miss because she's done her check at the last minute before she hung [a high risk medication] and connected it, or it's been double checked by the second RN, between the 2 of them they've identified that. Those probably don't get in our [incident reporting] system. (*OBS/NEO Nursing Manager 1*)

*Interviewer:* You stated if medication was missed you would report that; would you report an incorrect order (drug prescription)?  
(*OBS/NEO Nursing Manager 13*): No. No mistake has occurred yet - [the physician] has to modify their order but still no error has actually occurred because it was double checked. We have a third check by pharmacy because the

yellow copy goes to pharmacy, but hopefully by the time it gets there one of the three of us would have picked it up.

The double check process was seen as a risk mitigation technique, and reporting the near miss was not viewed as beneficial. Near misses in this context are events would have reached (and possibly harmed) the patient were it not for the double check. However, given that the patient was not harmed, the view was that an incident report was not necessary – the absence of a bad outcome determined that an incident report was not logged. However, double checking not triggering an incident report was not confined to an outcome interpretation:

*(GIM Pharmacy 2)* We always get somebody else to double check before something is prepared and dispensed to a patient.

*(Interviewer)* Does that second check ever trigger one of these reporting forms?

*(GIM Pharmacy 2)* No not at that level because it hasn't left the department.

Here, the reason for not reporting the problem caught by the double check was not outcome determined – there was no reference to the absence of a bad outcome justifying non-reporting. The reason given here was that the medication had not yet left the department. As such, when the problem caught by the double check was kept local, there was no need to report the problem. Generally, the principle of reporting – into an incident reporting system – a problem caught through double checking was not widely held.

### **Alternative views on Double Checking**

These themes were informed by the interviewees' responses, but were further developed through the literature, and as such were deductively derived.

### Recognizing that double checking requires training and a dedicated environment

The difficulty associated with performing a double check, in an environment where the checker was distracted, was not as evident as first thought.

[After I missed a medication error that I had double checked], it made me step back and realize you need to concentrate, and maybe I should have said to those people “you’ll need to wait twenty minutes, once I’m done this you’ll have my total attention.” And it really makes you in the future think ‘well I’m not gonna do that again’. (*GIM Pharmacy 2*)

Unlike a cursory view, an independent double check is a cognitive activity requiring the double checker’s concentration. This pharmacy employee learned by experience that double checking was not a routine activity; it needed more cognitive attention than was initially assumed. This experience served to teach the pharmacy employee to ensure that the double checking environment is important, such as having a place where one could be minimally distracted, in addition to being assertive as a checker that the task at hand should not be interrupted. Overall, the realization that an independent double check was not an obvious process was a step forward. As noted by the pharmacy employee, the quote above was a learning experience – but was confined only to that employee through his/her reflection. The importance and the process of conducting independent double checking could be communicated through training. Having a physical environment that minimizes distraction coupled with training could be effective at helping strengthen double checking as a safety tool.

#### Introducing automated double checking

So far, we have discussed the double checking process as involving various independent individuals – people checking other people’s work. However, the checking process can also involve computerization.

*GIM Pharmacy 1:* We don't check the MARs (Medication Administration Record) routinely unless something comes up. It would just be by chance that we would discover errors or if nurses identify errors and bring them to us and we discover it.

*Interviewer:* Some computer algorithm [could] check the MAR against the pharmacy list.

*GIM Pharmacy 1:* Yeah [but only] if you have an electronic MAR... That would eliminate a lot of errors I think.

The Medication Administration Records or MARs were paper carbon copies, which had many problems, such as illegible physician handwriting, difficult to read carbon copies, lost papers, in addition to not being routinely checked. Eliminating the need for human intervention when a computer could do the job more efficiently and reliably is a positive aspect to the double checking process.

#### Expanding double checking beyond error detection

Double checks to this point have been concerned with catching problems and thus preventing harm to patients. However, double checking need not be used exclusively to find problems. A nurse reflected on how double checking was used to share best practice.

We do have policies that we must double check on many things, but even things we don't have to double check on, we do, and I think it's just because we are so safety conscious...I think double checking is also just verifying what we're doing. "I'm thinking of doing this, what do you think" and someone else might say "no I think such and such is a better way of doing it". And again to me that's not a near miss, it's not a mistake. I think we just give a higher standard of care or better quality because we're always looking for the best practice and double checking gives us that.... Our formal double checks as well as our informal ones make sure we're always following best practice guidelines either formally or informally.(*OBS/NEO Bedside Nurse 9*)

Here, the idea behind the double check was not compliance with a standard or to catch a mistake, but to share opinions on how best to accomplish the work. While a "formal" double check would fall into the category that most practitioners espoused (finding a

problem), this “informal” double checking to help share best practices is a novel interpretation, and could have a positive influence on patient care and safety.

Overall, the problems with double checking seen through the themes *Trust in double checking as an independent process*, *Double checking as an unreported near miss*, and *Costs to double checking*, and the alternate views of double checking through *Recognizing that double checking requires training and a dedicated environment*, *Introducing automated double checking*, and *Expanding double checking beyond error detection* provide insight on a process that is rarely questioned.

## **Discussion**

In this section, we further develop the results, and provide theoretical interpretations. Double checking is seen as a trusted practice by healthcare practitioners (19–21), in spite of the lack of supporting evidence (3,7). “Double-checking requires that one fallible person monitor the work of another imperfect person” (22 p1659). As such, it is subject to social psychological concepts of groupthink (where one tends to align one’s opinions with the majority) (23), hindsight bias (using an outcome to judge a practitioner’s decisions ) (24), and the investigative term “what you look for is what you find” (25). Double checking has other weaknesses that are worthy of exploration.

Literature has addressed some of these problems. Armitage undertook a qualitative study of double checking, and found that the double checking process is rarely questioned, but that those who do not follow it are blamed (8). He also found that often people involved in double checking 1) defer to authority, by trusting that a checker with a more senior position would be trusted more than one in a junior position, 2) enter a phase of “auto processing”, where the act of checking is given little active thought, 3) reduce their level of

individual responsibility (8). These concerns as well as the idea of redundancy diffusing responsibility, were identified as weaknesses of double checking when seen through the High Reliability and Normal Accident safety theories (22). Larger issues can go unrecognized due to double checks finding problems, and practitioners solving those problems at an individual level (26). ISMP warns “do not use double checks as a means of fixing problems when more fundamental redesign is needed” (13 p1).

Double checking was relied upon by some to catch mistakes that they themselves could miss. This can be seen through a construct named the Efficiency Thoroughness Trade Off (or ETTO) (27). Hollnagel argued that in a resource constrained environment, efficiency and thoroughness cannot be simultaneously achieved. He elaborates the ETTO concept for groups involved in distributed work, which he calls “Collaborative ETTO”. A person in the group prioritizing thoroughness would *make an effort* to confirm that the input (s)he receives is correct, and consider the possible side effects of what (s)he produces as output for the next person. A person in the group prioritizing efficiency would *trust* that the input (s)he receives is correct, and that the next person will perform any necessary checks and verifications. Hollnagel remarks “For distributed work, for the social fabric, there is never enough time to check everything. It is therefore necessary to trust what others do. Trading off thoroughness against efficiency is in practice the only means available to save time and resources... It’s as if everyone reasons in the following way ‘I can allow myself to be efficient, because the others will be thorough’” (27 p115-6). He continues,

If only some people do that, the system may be able to correct itself and to find a balance of functioning that is both reasonably effective and reasonably thorough. But if everyone begins to work in this way, for instance because of systemic pressures, the net result may be that something goes wrong. Yet the reason for that is not that anyone did anything that was manifestly wrong or incorrect. The

reason is more likely that everyone did their own bit of ETTOing, quite as they normally do. (27 p 116).

When problems found through double checking are not seen as potentially systemic – that is, when they are confined to a single department or unit – there may be the perception that no one else needs to know about the problem. The view is that “We understand it better than others, and we have fixed it to our satisfaction, so no one else needs to know” - not as a deception, but as the way normal work proceeds (28,29). This practice has been termed “in family” in accident investigations (30,31), as the information that was kept (often informally, without a paper trail) to a single department would have been useful to other departments, although this was not known to the department holding the information until a disaster struck. “In family” thinking can have organization wide consequences. To avoid an “in family” approach to double checking and reporting in healthcare, communication could take place with other departments, such as recording an incident discovered through an “in family” double check in an organization-wide incident reporting system.

The costs of having to employ multiple checks, and the additional workload double checking adds to the front line are strong themes in critiques of double checking. Lack of time was one of the dominant themes in a study of double checking by Armitage (8). This has been found elsewhere, as in the Intensive care unit (ICU),

Most hospital policies require that two nurses manually check every patient controlled analgesia (PCA) order change against the electronic medical record (EMR) order. In the ICU, we observed PCA orders changed, on average, four times per patient and it takes 8 to 10 min for one nurse to find another nurse to confirm the orders match. With 20 patients in this ICU, confirming orders relies on heroism and wastes 8 to 10 nursing hours a day, one full time equivalent of nursing time per unit. (32 p527)

One full time equivalent in one unit due to a double checking procedure has an opportunity cost, which might not be adequately accounted for. Overall, the cost of double checking should be a prime consideration before requiring the procedure.

Double checking should not be discarded altogether, however. It can be an effective process, especially if it is one of a set of safeguards used in combination to ensure safety, i.e. not the only tool in use. For example, in a study of emergency department nurses' error recovery mechanisms, Henneman et al. found that double checking is only one of a suite of strategies including surveillance, anticipation, awareness of the "big picture", and experiential knowledge. Further, double checking was supplemented by "theoretical knowledge of pathophysiology and pharmacology, and [the nurses'] critical thinking skills as backup" (33 p74). Wheeler et al. reflected on a medication error revealed during a simulation.

During one of the in situ simulations, a nurse incorrectly prepared the amiodarone, resulting in a significant dosing error. This was identified as a knowledge gap and a systems issue, and steps were taken to correct this latent safety threat using: different package labelling; the addition of a backup clinical pharmacist to the code team; the use of independent double-checking of all code medications; continued staff education and training.(34 p510)

Note that there are a variety of corrective actions mentioned, highlighting that double checking need not be a single tool used in isolation.

Training on how best to perform an independent double check could well improve its effectiveness. ISMP states that an independent double check is where "two people separately check each component of the work process... So holding up a syringe and a vial and saying, 'This is 5 units of insulin, can you check it?' is not effective"(13 p1). Reports on mortalities in radiotherapy (35,36) and medication administration (9,37) highlighted that

there was little training on the expected double checking procedure (35,38). Paparella adds “Ask a roomful of ED nurses to explain the double check process for high-alert medications and one is bound to get a variety of answers about the correct procedure” (17 p 631).

Double checking may actually require a specific skill set, which is not often acknowledged (39). Including double checking in a training roster may help healthcare practitioners gain this specific skill set.

One of the environmental changes to ensure an independent double check is a dedicated space where no interruptions are allowed, which can be challenging, as found in this study. Efforts at a “sterile cockpit” environment, whereby interruptions would be minimized during highly cognitively intensive tasks (which could encourage an environment of thoroughness), have met with mixed results (40). Conversely, establishing a distraction-free zone (in this case, a floor mat and signs on computers) whereby “When staff members were in the distraction-free zone, they were not to be bothered until their task was completed”, as well as dedicated time to use the zone, has met with success as being one of many interventions addressing pediatric medication safety (41 p 5). Establishing a physical environment to minimize distraction for cognitively intensive tasks is a step in strengthening the double checking process.

Computerized double checking is seen as a solution to overworked, undertrained, unreliable double checkers. A study titled “From Heroism to Safe Design” states that the above problem of an FTE of nursing devoted to double checking could be alleviated by computerization (32). Radiotherapy has endorsed computerized checking for a variety of therapies (42,43) as has medication administration in surgery (44). Accreditation Canada, England’s National Health Service (NHS), as well as a provincial coroner recommend

computerized checking, endorsing manual double checks only if computerization is not available (1,9,45). However, computerized systems designed to replace the imperfect manual double checking process themselves are fallible (46,47). Furthermore, an overreliance on computerized processes can also be problematic (29). While computerization may be helpful in double checking, it is not an infallible solution.

Furthermore, double checking need not be exclusively confined to looking for problems. It could be used as a mechanism of knowledge transfer. For example, as a way to increase “capacity to bring in fresh perspectives on a problem and listen to the voice from below” (48 p35), double checking could be a tool to ensure that best practice and novel solutions are communicated between those on the front line. “Patient safety efforts, ... might recognize, celebrate, and enhance the positive aspects of diversity that guarantee the emergence of resilience in complex situations” (49 p194). Using double checking in an innovative fashion could help align it as one of these emergent resilient patient safety efforts. Even in this study, a nurse recognized the potential of a “double check” to be fruitful exchange of ideas towards best practice and safer care.

## **Conclusion**

Double checking, while a trusted process in many areas of patient care, is not infallible. In addition to having a weak evidence base, the process has limitations. Weaknesses of the process were highlighted in this study through themes of trust in double checking as an independent process, double checking seen as an unreported near miss and the costs of double checking. The Efficiency Thoroughness Trade Off explained how double checking can be problematic if all involved prioritize efficiency over thoroughness. “In family” described how double checks confined to one area might be problematic to the larger organization. The highlighted opportunity costs of double checking can be non-trivial.

Alternative lenses were discussed whereby double checking can be seen as a specialized activity deserving of training and physical environment considerations, a process worthy of thoughtfully employed automation, and a practice that need not be confined exclusively to error detection.

This study has limitations. It was meant to explore the topic of double checking based on data derived from one case study and on the literature. As such, the findings are not generalizable to a variety of contexts. However, as is the case with qualitative studies, the purpose is not to provide generalizations, but to offer in-depth insight through “thick, rich descriptions” (50,51) into the dynamics that can be transferred to other, similar environments (18,52).

As this study shows, double checking deserves more questioning, given the limitations to the process. Practitioners, who are aware of the weaknesses, could view double checking through alternate lenses, and help strengthen this ubiquitous process that is rarely challenged.

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## **Manuscript #4 – Comparison paper**

An earlier version of this manuscript was accepted to the Academy of Management conference. This version was presented at the AoM annual meeting in Vancouver August 10, 2015. This manuscript has not been submitted to any journal yet.

**Manuscript title:**

Incident reporting systems: A comparative study of two hospital divisions

## **ABSTRACT**

Previous studies of incident reporting in health care organizations have largely focused on single cases, and have usually attended to earlier stages of reporting. This qualitative comparative case study looked at various stages of the incident reporting process in the General Internal Medicine division and the Obstetrics and Neonatology divisions of a large hospital. The findings showed that there were major differences between the two divisions in terms of: a) what comprised a typical report (outcome based vs communication and near-miss based); b) how the reports were investigated (individual leader vs interdisciplinary team); c) learning from reporting (interventions having ambiguous linkages to the reported incidents vs interventions having clear linkages to reported incidents); and d) feedback (limited feedback vs multiple feedback). The differences between these two divisions can be explained in terms of the influence of litigation on practice, the introduction of the incident reporting system and relative availability or lack of interprofessional training. Implications for practice are addressed.

## INTRODUCTION

A number of studies have found high incidences of adverse events in health care. These include *To Err is Human* (Kohn, Corrigan, & Donaldson, 1999), the UK's *An Organization with a Memory* (Chief Medical Officer, 2000) and the *Canadian Adverse Events Study* (CAES) (Baker et al., 2004). Incident reporting has been recommended as one of several tools to address this patient safety problem (Donaldson, 2005). Incident reporting systems (IRS) have met with some success. For example, Swartz (2011) describes the success a hospital had with an electronic IRS which allowed key players greater access to information they needed to effect and prioritize corrective actions. Osmon et al. (2004) noted the diversity of front line practitioner reported events in a successful ICU IRS. Using a new human factors focus within an IRS, Morag et al. (2012) reported very promising results. Overall, there have been several reports of success with various IRSs.

However, IRSs have been sharply criticized as well. Blais, Bruno, Bartlett, & Tamblyn (2008) compared the chart review process against an incident reporting technique in adult medicine and surgery in hospitals in a province, and found that only 15% of incidents in the chart review were identified in the IRS. Shojania (2008) spoke of the “frustrating case of incident reporting systems”. He highlighted physician underreporting, the lack of a denominator in IRS metrics (incident reports reveal only how many incidents occurred, but do not capture how many could have occurred), and the deceiving metric of compliance with having an IRS irrespective of how the system functions (the system could be solely a data collection system without any follow up). In a later paper, Shojania further stated that relying on IRSs exclusively is not a good way to assess patient safety, but instead a number of different methods should be used (Shojania, 2010). In his report “Hospital

Incident Reporting Systems Do Not Capture Most Patient Harm”, the Inspector General of the American Department of Health and Human Resources noted that administrators rely heavily on IRSs to identify problems, in spite of the well-known underreporting problems (Levinson, 2012).

Despite extensive studies on IRSs, few researchers have identified or investigated the different stages of incident reporting. Most studies tend to focus on the reporting phase, whether and how it occurs (Anderson, Kodate, Walters, & Dodds, 2013; Haller, Courvoisier, Anderson, & Myles, 2011; Hewitt, Chreim, & Forster, 2014; Osmon et al., 2004; Pronovost et al., 2006). Less attention has been given to what happens after a report is entered. Yet, studying what happens post-report submission is essential because it allows us to discover if IRSs contribute to or fall short of enhancing patient safety and to understand how this occurs. Further, few studies have attempted to compare IRSs in different organizations or departments. Studying more than one case allows researchers to see dynamics across cases, “to understand how they are qualified by local conditions, and thus to develop more sophisticated descriptions and more powerful explanations” (Miles & Huberman, 1994:172).

The purpose of this study is to understand the different stages of electronic incident reporting and to do so in a comparative study of two hospital divisions: General Internal Medicine (GIM) and Obstetrics and Neonatology (OBS/NEO – for the purposes of this study, Obstetrics and Neonatology will be treated as a single division except where noted). These two divisions were chosen because they used the same electronic IRS differently. In addition, OBS/NEO was one of the earliest divisions to engage in electronic incident reporting, while GIM adopted the system later. Our preliminary discussions with divisional

representatives had previously indicated that the dynamics associated with the IRS were different in the two divisions, and we thus pursued an in-depth study of these two cases.

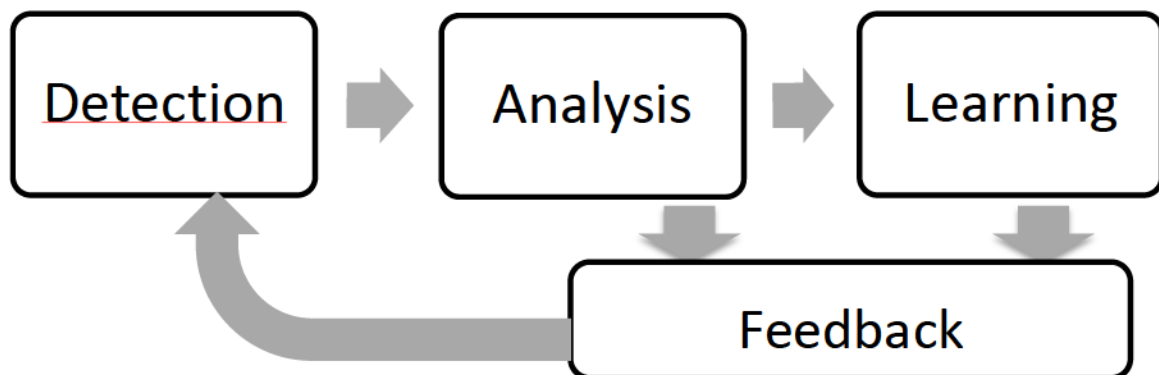
## CONCEPTUAL BACKGROUND

IRSs are complex socio-technical systems. Øvretveit provided the introduction to a special issue of *Social Science & Medicine*, stating that

The social sciences are increasingly viewed by policy-makers and implementers as a resource for helping with the considerable challenges they have encountered in ‘implementing’ changes which are thought to be necessary to improve safety and quality...the value of social science perspectives [include] questioning common assumptions and showing why some strategies—such as voluntary incident reporting – are not meeting their aims. (Øvretveit, 2009:1780,1782)

Hor et al. found that there is a multiplicity of accountability roles affiliated with incident reporting, stating that “the incident reporting system and its policy are interwoven with other accountabilities in the local context” and that “local accountabilities can also be in conflict with the aims of the incident reporting system and the incident management policy” (Hor et al., 2010:1097).

Incident reporting is fundamentally a multi-stage process (Hewitt, 2013; Waring & Currie, 2009) as shown below.



Generally, information enters the IRS at the detection stage, the reports are investigated and analyzed at the analysis stage, which feeds into the learning stage, from which incident

reporting leads to some change in understanding or practice. Feedback can occur at the analysis and/or learning stages.

***Detection Stage*** The majority of the studies of IRSs to date have focussed on the first stage; reporting. A few studies have described the reporting phase: Tighe, Woloshynowych, Brown, Wears, & Vincent (2006) reported that a nurse or physician filled out a paper form with the aid of an incident book, classifying the type of incident in broad, pre-defined categories with as much detail as possible, up to including contact detail of witnesses; Cunningham & Geller (2012), noted that the reporter was given reporting criteria and a form with check boxes and free text in which to enter an event description. However, the majority of studies focussing on the reporting of events into IRSs highlight the factors enabling or inhibiting reporting. Barriers that have been identified to prevent detection and reporting of incidents are numerous, and include fear of exposing incompetence or reprisal (both public and medical), lack of time, lack of education on what is a reportable incident, lack of feedback and futility (Brubacher, Hunte, Hamilton, & Taylor, 2011; Kreckler, Catchpole, McCulloch, & Handa, 2009; Noble & Pronovost, 2010). Studies identifying enablers of detection and reporting are less numerous, and include incident severity, evidence that the profession values reporting, greater availability of reporting pathways, timely feedback and visible changes linked to reports in the IRS (Brubacher et al., 2011; Hewitt et al., 2014; Kreckler et al., 2009).

However, not all studies of the first stage of reporting identify enablers and inhibitors to reporting incidents. For example, Waring (2005) proposed that the emphasis on assigning blame in incident reporting neglects the culture of medicine, such as physicians' belief in the inevitability of error and viewing reporting as a bureaucratic exercise. Hewitt et al. (2014)

looked at the frames underlying nurses' and physicians' decision to report, and found that attention is rarely given to systemic, larger organizational safety issues. An underlying message of a variety of studies (Anderson et al., 2013; Logio & Ramanujam, 2010; Moore & McAuliffe, 2012) is the need to increase the number of reports entered into the reporting system, and as such, these studies remain focussed on the first stage of reporting.

*Analysis Stage* Fewer studies have looked at other aspects of reporting such as the analysis stage. Pham, Girard, & Pronovost (2013) recommended investigating reports thoroughly and involving multiple stakeholder input to enhance the value of IRSs. The large quantity of reports entered into IRSs has been noted as a possible barrier which can limit the ability to do meaningful data analysis (Cook, 2013; Wachter, 2010). Bush (2010), in a descriptive study, traced how a reported incident was investigated, describing how a multi-disciplinary team interviewed those involved in each incident, and subsequently met to discuss and agree on findings. Tighe et al. (2006) described a clinical risk management team which collected completed reporting forms, assigned severity and likelihood of recurrence scores, and then entered the information into a central reporting system. Cunningham & Geller (2012) described a review process whereby individual managers wrote their follow up action on the same reporting form filled out by the reporter, but in a different text box. In Waring & Currie's (2009) study of a UK hospital, reports from the hospital were analyzed by a central risk management department, sometimes with a brief assessment which prioritized managerial accounting over the contextual narrative describing the incident, overriding the reporter's effort to provide all relevant details to understand the event. As these studies show, there are a number of different ways in which reported incidents can be analyzed, but

only a few studies of IRSs describe these processes, and even fewer studies undertake a comparative study of incident analysis.

### ***Learning***

Some studies have addressed learning in hospital settings. Bush(2010) described how an interdisciplinary team that investigated incidents then presented their findings to a Quality Assurance Committee with senior leadership, whereby the recommendations were oriented to system fixes (changes in design) as opposed to individual fixes (training). Tighe et al.(2006) described how, once the clinical risk management team entered reports into the system, the same team reviewed the reports monthly, and followed up investigations and/or actions. In Cunningham & Geller's (2012) study, managers who filled out their section of the reporting form collected the reports and sent them to a central risk management department for review and database entry. Generally, however, IRSs are seldom cited as the genesis of learning interventions. Mahajan (2010), focusing on the IRS, stated that the current paradigm of quick judgements and assigning of blame does not promote learning, whereas analysis with a human factors lens and then feedback to the reporter are key practices promoting learning from IRSs. The few studies that describe the learning phase in IRSs range from storing reports to interprofessional meetings with an accountable process to follow up corrective actions, yet comparisons between different IRS learning processes are not present in the IRS literature.

***Feedback*** – In the WHO's guideline on how to establish reporting systems, feedback is emphasized as a key feature. “Even with simple systems that focus primarily on recognizing hazards, resources should be available to support follow-up on reports, provide feedback to the reporter, and conduct at least a limited investigation when indicated”

(Donaldson, 2005, p. 55). In a study of the UK NHS, fifteen different aspects of feedback were highlighted as recommendations for IRSs (L. M. Wallace, Spurgeon, Benn, Koutantji, & Vincent, 2009). Overall, if data is collected, including that from IRSs, it serves little purpose if its effects are not fed back to the reporter (Benn, Arnold, Wei, Riley, & Aleva, 2012). Feedback is an important yet often overlooked area of IRSs.

***IRS in GIM and OBS/NEO*** Incident reporting has also been studied in specific hospital departments. As this present study investigates incident reporting in the division of General Internal Medicine (GIM – a subset of the Department of Medicine) and the divisions of Obstetrics and Neonatology (OBS/NEO - a subset of the Department of Obstetrics/Gynecology & Newborn Care), a brief review of the literature concerning incident reporting and patient safety in these two divisions is warranted. General internal medicine is a core hospital division, and takes care of a wide variety of patients and patient conditions, although the vast majority of the inpatients are elderly. A number of studies of IRS use in GIM have been conducted. One study, aiming to improve reporting rates by reminding residents to report, found that the programme only succeeded in the short term (Boike et al., 2013). Another study used Root Cause Analysis (RCA) in the analysis of reports, and revealed that human error is often linked to technical and organizational causes (Lubberding, Zwaan, Timmermans, & Wagner, 2011). Obstetrics and Neonatology's patients are pregnant mothers and at risk and premature babies respectively. A study found that the overall perception of safety and management support predicted reporting behaviour in a Neonatal Intensive Care Unit (NICU) (Snijders, Kollen, van Lingen, Fetter, & Molendijk, 2009), while positive team dynamics in labour and delivery were found to decrease the need for incident reports (Waters, Hall, Brown, Espezel, & Palmer, 2012).

Another study recommended a structure for a critical IRS in Obstetrics and Neonatology, suggesting specific incident categories and a detailed review process (Ahluwalia & Marriott, 2005).

However, despite the richness of the literature on individual departments and their struggles at the reporting stage, few researchers have analyzed departments in parallel in a comparative study.

This qualitative comparative case study of GIM and OBS/NEO hospital divisions attempts to fill some of these gaps by answering the following research questions:

*Research Question 1: What are the similarities and differences in incident detection, the analysis process, and learnings in two hospital divisions, GIM and OBS/NEO?*

*Research Question 2: What factors account for these differences?*

This study extends work that has been done on IRSs by going beyond the reporting stage and by undertaking a comparison of the IRS processes in two departments.

## **METHODS**

Qualitative studies are useful for inquiries that ask what, how and why questions, “which help us to understand social phenomena in natural (rather than experimental) settings, giving due emphasis to the meanings, experiences, and views of all the participants.” (Pope & Mays, 1995, p. 42) As this present study seeks to understand the workings of an IRS in different settings, it is suited to a qualitative research approach. The study adopts a comparative case study design. Comparative case studies help researchers avoid jumping to conclusions with limited data, avoid ignoring disconfirming evidence, and prevent them from being overly influenced by higher profile study subjects (Eisenhardt, 1989:540). A comparative case study design is more robust than studying a single case, as

replication can be realized – either literally (when similar results are obtained between cases) or theoretically (when contrasting results between cases emerge) (Yin, 2003).

The study focused on voluntary incident reporting and patient safety in a multi-campus teaching hospital in Ontario, Canada. The IRS at the hospital was available to employees through any networked device. The general process involved the following: The reporter entered information using the patient's medical record number, identified the event, and provided a narrative describing the patient safety incident using facts. Incident investigators at the hospital were informed of an incident report by email and could forward reports to other departments for further investigation. Once reports were investigated and considered closed (and removed from email), they were forwarded to Core review for larger hospital issue investigation and archiving.

Data collection began in spring 2012 in GIM and ended in fall 2014 with OBS/NEO. Our data collection in each department started with our attending a quality review meeting where the researchers were introduced to key personnel who would later become interviewees. These key individuals helped us access other interviewees by contacting managers and practitioners. Over five months, two researchers (both independently and together) confidentially interviewed GIM participants; a similar process was adopted for OBS/NEO. Overall eighty-five participants were interviewed as shown in Table 1.

<b>Job Category GIM</b>		<b>Job Category OBS/NEO</b>	
Physicians	<b>11</b>	Physicians	<b>8</b>
Nurse Leaders <sup>1</sup>	<b>5</b>	Nurse Leaders	<b>15</b>
Bedside Nurses	<b>15</b>	Bedside Nurses	<b>15</b>
Pharmacy	<b>3</b>	Midwives	<b>3</b>
Physiotherapists	<b>3</b>	Respiratory Therapy	<b>4</b>
Nursing Support	<b>3</b>		
<b>Total</b>	<b>40</b>	<b>Total</b>	<b>45</b>

**Table 1- Generic interviewee titles**

The interview included questions about the IRS: how it was introduced, structured and used. There were also questions about safety practices and safety culture. Interviews averaged approximately 45 minutes, and were digitally recorded and subsequently transcribed. Data analysis was undertaken by two researchers who met to discuss the themes in the interviews and the derivation of codes. Atlas ti software (GmbH, Berlin, Germany) was used to code the interviews and retrieve quotations. The analysis involved both a deductive and inductive approach (Miles & Huberman, 1994). Through a reading of the literature, we were informed about concepts and approaches related to IRS and patient safety (deductive approach); some sample codes based on the literature included Fear of Reporting, Feedback, Individual Staff Focus and Systems Thinking. Our analysis of the data revealed local practices related to the use of the IRS (inductive approach); some sample codes derived inductively included Pre Screen, QA committee, Litigation and History. Through an iterative process of moving between the literature and the data, we identified differences in reporting, analysis and learning in GIM and OBS/NEO, as well as the reasons why these differences exist. We conducted the analysis for each department separately and then engaged in comparison. In other words, we followed Miles and Huberman's (1994) recommendation to do a within case analysis followed by a cross-case analysis.

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<sup>1</sup> Nurse Leaders is a term referring to all nurses with a job function not exclusively at the bedside.

This study underwent ethics review at both the hospital where the study was conducted, and the researchers' university. Trustworthiness (Guba & Lincoln, 1985) was established by ensuring the researchers were in constant communication, questioning potential biases and assumptions, and returning to the data when there were disagreements. Member checking (Guba & Lincoln, 1985) was undertaken through presentations to interprofessional (quality) meetings of the different divisions and seeking feedback on the results reported.

## RESULTS

In this section, the divisions' experience with incident reporting is analyzed: first, GIM, then OBS/NEO. In each division, the reporting process is examined through reporting events, analyzing events, learning from reported events and system feedback.

### **Detection, Analysis, Learning and Feedback in GIM**

*Incident detection – GIM – Predominantly nurses, outcome based* Incident detection in GIM was examined in its connection to the history of incident reporting in that division. Historically, incident reporting was on paper, done exclusively by nurses, and was seen as punitive. The fact that it was a paper based system tended to restrict its use to nurses: “the whole sort of paper incident report used to be largely just nursing generated” (*GIM Physician 6*). Although physicians and other practitioners could and did report into the present IRS, they did so much less than did the nurses.

I think we're just so used to thinking of ourselves as a unit in terms of nursing practices and nursing processes and we're so used to dealing with issues within our own scope of practice that I don't think many people think of [reporting] as being a tool for physician improvement as well. (*GIM Nurse Leader 4*)

Furthermore, there was a perceived punitive component to this reporting. The perception of the old system being blame-based lingered in the minds of some of the nurses with longer tenures.

For anybody that's been here as long as I have, you had 3 medication errors and you were being disciplined...I don't know if that was even indeed the case but that was what I grew up being a nurse at the bedside being petrified of 'oh my goodness if I made this error' (*GIM Nurse Leader 3*)

However, at the time of the interview, interviewees stated their knowledge that the IRS was non-punitive, and that the intent was to learn from reported events. A nurse described, "Med errors are not obviously in favour of my career ...but incident reports ... should be looked at so [incidents] can be stopped in whatever way possible" (*GIM Bedside Nurse 11*). Many nurses espoused similar opinions that the present IRS was non-punitive. Physicians were more skeptical about the IRS being non-punitive.

I think there's still quite a culture that people are afraid to report things because of either sort of punishment in the future whether it be medico-legal punishment, punishment from a colleague or a superior or causing a relationship to deteriorate between 2 staff physicians because someone told on me basically. (*GIM Physician 7*)

With nurses more or less believing that the system was non-punitive, what did they report? Overall, falls and medication errors comprised the vast majority of reported incidents in GIM: "The things that come to us most frequently are things that are nursing related; medications, transcriptions, falls" (*GIM Nurse Leader 5*). These incidents were realized – a patient had fallen, a medication error had occurred. The orientation of most of the reports was outcome based, that is, the outcome determined whether or not a report should be written. This had consequences for near miss reporting, as by definition near misses do not have a negative outcome. Hence, near misses were rarely reported, despite the corporate messaging that they should have been.

Near misses...I think people are thinking it's not an incident, it's a near miss, even though we should still report them. It is still time consuming so I think near misses don't get reported as much as they should, if at all. (*GIM Bedside Nurse 3*)

In summary, in GIM, typical incidents were outcome based (chiefly falls and medication errors), and reported principally by nurses. Despite the blame-based past, nurses stated that reporting was now generally non-punitive.

***Analysis process – GIM –siloe d approach*** The unit level review was undertaken by a nurse leader who, upon reading the incident in email, decided on the level of follow up. The follow up that the nurse leader engaged in directly was often focussed on an individual that was involved with the reported incident. An example on narcotic disposal is described below, along with the intervention that the nurse leader did with respect to this incident.

There is a proper way of wasting a narcotic and [the nurse] didn't use that. So that would be my recommendation and then details of follow up would be: [The nurse] needs to review the narcotic [policy]. (*GIM Nurse Leader 3*)

In some situations, the individual described in the report (with whom the follow up would be conducted) was unknown. "With this [IRS] I don't have the assignment readily available; I don't have the chart readily available so I can't make the investigation to see who the nurse was. So my solution is to present it at a staff meeting, but again it doesn't make it as meaningful" (*GIM Nurse Leader 3*). In contrast to an individually focussed approach, the nurse leader might have viewed the incident with a systems lens, seeing the incident in a larger context. A nurse leader reflected on systems approaches, instead of focusing exclusively on an individual: "Because if you made a mistake, most likely it's human error or there's some system in place that was just not working" (*GIM Nurse Leader 2*). However, a systems view was not as frequently engaged with as the individual view.

Once the investigation was over, the nurse leader closed the incident report. The incident reports were also separately reviewed by a physician (clinical reviewer) to determine if harm had occurred to the patient, and if it was avoidable. The sequence of the nurse leader review and the physician review was not clear – they may have been in an order, or simultaneous. “You write out what it was and then there’s a check... ‘was that related to the medical treatment or was that related to the medical condition?’ and ‘was it preventable?’” (*GIM Physician 2*). The level of information given, as the majority of reports were written by nurses, was often insufficient for the physician reviewers to undertake a full review.

Well the nurse for example doesn’t go into the detail that you would like to have into the case.... [A review] took me almost an hour in just trying to figure out what that person was trying to say what happened... When a physician reports, especially if we’re dealing with a more medical issue, it’s a little bit better to be done by somebody who has a little bit more knowledge into the medical issues. (*GIM Physician 3*)

Some users stated that the system had yet to advance beyond data collection, implying that the potential of the IRS had not been realized. “We need to be sitting down probably with the nurse leaders or somebody from the Division, looking at how you prevent medical errors... The way I perceive it [the IRS] is just data collecting at the moment” (*GIM Physician 2*).

All in all, in General Internal Medicine the various reviews took place independently – nurse leaders and physician reviewers often did their reviews in their offices, reviewing the same (typically nurse) reported events. There was some follow up at the individual level for nurses but there was no joint (physician and nurse) overview of reported incidents.

*Learning through reporting – GIM – ambiguous linkage to reports* Nurse leaders stated their view that the learning that individual nurses received were “teachable moments”, where the approach was non-threatening, and the individual felt safe to discuss incidents with the leader.

I always try to use it as something like a teachable moment ... You don't want people to be afraid to tell you they've made a mistake and so I think we've done a very good job. But people still are very nervous... All we want to do is learn from this ...as long as you walk out with a way to improve your practice that's what I believe it's all about, to make it safer for the patients. (*GIM Nurse Leader 2*)

A systems view could also result in learning from reported incidents,

For me it's very helpful because now I can see trends... [People] individually have their own problem, but this now allows us to see it as a systems issue. So we notice that this mistake is happening with this medication or this process so we can go back and discuss it. We are able to pinpoint a systems issue rather than reflect on one individual issue, which for me is very helpful because it's education, it's global, it's not a problem with a nurse, it's usually related to a system. (*GIM Nurse Leader 4*)

This approach was not as common as individual “teachable moments”. When asked what learning emerged from the IRS, a physician reviewer noted flagging cases suitable for Mortality and Morbidity (M&M) rounds.

From our point as the Clinical Reviewers we review them all and then we will note which ones we think might be important to review within the Division as far as for Mortality & Morbidity rounds. So things of more clinical interest instead of structural or administrative changes that need to be looked at. (*GIM Physician 2*)

M&M rounds were meetings that traditionally physicians attended, to analyze a case in detail to determine if there was, as a physician stated, a “cognitive” (a decision error on the part of the physician in the case) or a “system error”. However, since physicians did not report frequently, many of the M&M cases had to be obtained through personal communication: “We haven't been using the [IRS] as our database to gather the cases” (*GIM*

*Physician 4*). Given that these rounds were for physician learning from cases, they didn't have an interdisciplinary audience. Overall, nurses' learning was mostly through individual "teachable moments", and less effort was exerted on systemic issues that might have been identified through the IRS. M&M rounds were to allow physicians to discuss catastrophic cases, which may or may not have been informed by a report in the IRS.

**Feedback – GIM - weak** Some of the participants did not know what happened to reports they wrote. "We hit a send button and I never hear about it again. It does nothing for me." (*GIM Bedside Nurse 1*). Others had a vague idea of the review that happened, "My manager will sometimes follow up with me. But whoever else it goes to, these people who review it, perhaps it goes to researchers, I don't know" (*GIM Bedside Nurse 8*). While staff meetings may have given back some information to reporters, not informing the reporter on the change that their report prompted got the reporters to believe their time was not valued: "I'm taking 10 minutes of my time [to report] I'd like to know that it's at least helping... They would probably encourage us to do more if we see 'oh it's making a difference' " (*GIM Bedside Nurse 6*).

It was also possible for reporters to become cynical of the IRS due to lack of feedback, which could have a demoralizing effect and serve as reason to not use the IRS.

Honestly it was an event that very significantly affected me emotionally but I didn't hear anything back from it. I didn't get any feedback as to how this was rectified and how we're gonna change the system or anything really. And so I think that was really frustrating and that's probably why I haven't been motivated to use it again. (*GIM Physician 10*)

Overall, feedback based on the IRS was identified as a major weakness in GIM.

**Summary – incident reporting, analysis, learning through reporting and feedback - GIM.** Incident reporting was done primarily by nurses. The types of incidents recorded were

primarily outcome based, and included mainly falls and medication errors. The analysis was undertaken by individual nurse leaders who more often than not had a focus on the individual. The individual physician reviewers assessed if harm was preventable, sometimes with difficulty. Learning through reporting mentioned by interviewees was individual “teachable moments” for nurses delivered by nurse leaders, and physician reviewers identifying cases for M&M rounds, although most M&M round cases were not informed by the IRS. Divisional knowledge of the incident analysis process was limited, and feedback to the reporters (aside from staff meetings) was rare.

### **Detection, Analysis, Learning and Feedback in OBS/NEO**

*Incident detection – OBS/NEO –Team approach, near miss reporting* In this section, we grouped OBS and NEO, but there were some differences between the two departments in practices, which we indicate where pertinent. In the past, OBS had an IRS unique to them, prior to the current version of the organization-wide reporting system. It was developed in house, and was not accessible beyond this division. However, many reported that the specific OBS IRS facilitated the transition to the present IRS in OBS. Below, nurse leaders described the history with the OBS specific IRS, and how it provided a background for the present day reporting practices.

[The OBS IRS] was exactly what the [current reporting] system is all about. And we were doing it years before the [current IRS] was invented. So I think most of the people in the Birthing Unit are quite comfortable on reporting the cases because we’re reporting the same things. (*OBS/NEO Nurse Leader 12*)

It was the very same philosophy [as the current IRS]; near misses, misses, policies that weren’t being followed. (*OBS/NEO Nurse Leader 7*)

OBS customized the present IRS by creating a drop down menu of specific indicators – beyond only the free text box that guided practitioners on what to report – inspired by experience with their OBS specific system. Near misses were expected in the IRS. Near

misses could be general (e.g. about to give the incorrect medication) or specific drop downs (e.g. a newborn having pH of gases <7 or >12.5), and were consistently reported, as can be seen from the quotes below.

I think the incident reporting system is probably good for [being proactive] because if it's a near miss then that can indicate an issue that needs attention before it's an outcome that's not a near miss, a definite incident where someone was hurt. (*OBS/NEO Bedside Nurse 2*)

[We report bad outcomes and near misses] because they're both learning experiences (*OBS/NEO Bedside Nurse 4*)

Drop down menus helped facilitate near miss reporting, and there was a clear expectation and a willingness to report:

They're gonna be reluctant to put things in say[ing] "Why are you [reporting] that?" "Oh because the PH was 6.9 and anything <7 we have to put it in" and the person says "Okay even when the baby's fine?" "Well even though the baby's fine it just has to go in" so I think that kind of defrays some of the why are you putting that in. (*OBS/NEO Physician 3*)

I just fit it in my day. It's like everything else I do it's just part of the duties it's just an accepted part. It's not an exception, it's not a burden, it's just part of the duties. (*OBS/NEO Respiratory Therapist 2*)

Near miss reporting was a well-established practice in Obstetrics, with interviewees having stated near miss reporting was part of their reporting culture.

There appeared to be no blame in incident reporting in Obstetrics. Further, emphasis on an interdisciplinary team approach ensuring completeness of the incident report was the focus.

On this unit we have a very close rapport with the doctor ...we have to be a tight unit because when the emergencies are happening we need help and we usually work as a tight unit. So if something goes wrong we talk about it and we make sure that all the information is filled in for it to not happen again and I don't feel like people are trying to blame each other when we fill these, it's just to improve how things are supposed to run. (*OBS/NEO Bedside Nurse 5*)

We have moved away from the culture of blame to more of a team-based culture.  
(*OBS/NEO Physician 3*)

Overall, Obstetrics had a history of incident reporting, and reporting near misses was a well-established practice. Practitioners generally indicated that blame was not a concern, and that an interprofessional team approach was important.

***Analysis process – OBS/NEO – multidisciplinary team approach*** Historically, the OBS IRS “generated a very similar review process to what the current [IRS] process has” (*OBS/NEO Nurse Leader 4*). As such, there was more experience and familiarity with the review process in Obstetrics. Incident review followed a sequence starting with a designated nurse leader or a delegate.

You have to go through all the documentation ... Sometimes you do need to interview the physicians and/or nurses to find out because the documentation isn't clear ... I try not [to delegate] cases that are too complex .... (*OBS/NEO Nurse Leader 10*)

This review involved an investigation, and may have had an individual focus and the report closed at that point. However, most cases were reviewed both at the nursing level and at pre-screen.

The pre-screen phase had a multi-disciplinary team looking at the completed reviews monthly: “[An obstetrician], the manager of the clinics as well as the critical care leader from Labour & Delivery and then often one of the care facilitators, so the 4 of them go through each case” (*OBS/NEO Nurse Leader 5*). The pre-screen committee did an analysis of its own.

Was there harm? Was there potential for harm? Was there no harm? Was there no potential for harm? From a 4 to a 10 you have to rate where you feel there was definitely harm. Was it because of medical care? Was it likely not because of medical care?... So in order to close an [incident report] and send it to the archives you had to answer those questions (*OBS/NEO Nurse Leader 5*)

The pre-screen committee decided on what to archive, what to follow up with further at the unit level, and what to bring to the Quality Assurance (QA) committee. The QA committee, which met monthly, was a multidisciplinary departmental committee with representation from all the divisions (including neonatology), and all the professions involved in OBS and newborn care. The types of cases that were brought forward to QA were those that had some system learning potential.

What goes to the QA table mostly is systemic problems. So if, for example, there's a communication breakdown between Anaesthesia or Neonates or whatever that goes to the QA table every single time because that can be prevented. *(OBS/NEO Nurse Leader 2)*

The analysis in QA involved a discussion inviting all at the table to contribute their professional opinions.

Everybody is pretty forthcoming and they hash it out at the table and you get a different perspective put on it and yes that makes sense, right. It takes some of the reaction out of it, when you get the different approaches, it's not all about me, you can see the other sides to different things *(OBS/NEO Nurse Leader 11)*

The QA committee was seen positively by most who were involved in the QA process.

Out of all the different obstetrical units I've participated in I think that the way they've developed the QA meetings and persistence with the QA meetings and the way it's recorded, reported and followed up is probably the most impressive... They have gone a long way to try and promote patient care and safety that way. *(OBS/NEO Physician 4)*

Overall, with the emphasis on multidisciplinary team meetings to review incidents at multiple levels, incident analysis in OBS/NEO was an inclusive process that allowed each discipline's voice to be heard.

***Learning through reporting – OBS/NEO- strong linkage to reports*** Often changes took place because of reported incidents; for example, a nurse talked about a call bell system problem that got resolved soon after he/she and others reported it, "So that was very

positive. We felt like oh these people are listening to us. We're not just filling these for nothing so that's good" (*OBS/NEO Bedside Nurse 5*). Other experiences of linking changes to incident reports were mentioned such as a rewrite of an HIV medication order sheet and a repair of an anesthesia call button in the OR. However, one intervention that was prompted by incident reports was spontaneously spoken of by multiple interviewees in Neonatology.

*(OBS/NEO Nurse Leader 4):* ...like unplanned extubations where they're supposed to complete an [incident report], we just said as a way of tracking, because sometimes it's only when you look at something that you see there's a pattern. Because it might happen to her, it might happen to her, but it doesn't happen to the same person and so people don't think about it.

*(Interviewer):* And that was found through [the IRS]?

*(OBS/NEO Nurse Leader 4):* Yeah, yeah.

*(Interviewer):* Do you know of any changes that have come about because of the [IRS]?

*(OBS/NEO Bedside Nurse 13)* Definitely like the accidental extubations is primarily one that we are learning from absolutely because it's only through that that we're learning how many are happening and... from that we can identify that more babies are being self-extubated than we would really like to see basically.

A quality improvement initiative for unplanned extubations was spearheaded by a respiratory therapist, who was asked to begin noting how many accidental extubations were actually happening.

So I put a memo and I say, okay we need to really track this guys, we think it's a problem. We need to have it reported. So we kind of made them alert ... and defined what's an accidental extubation... (*OBS/NEO Respiratory Therapist 1*)

These accidental extubations were not frequent to an individual practitioner – only when looked at collectively would anyone know there was a problem, which could be done through the IRS. Instead of only reminding individual practitioners to be more careful, the approach was to see these accidental extubations as a systemic problem. When the respiratory therapist learned that other neonatology departments were having similar problems, it lent credence to the idea that it might be a problem at this hospital too.

I went to a conference and [another hospital] presented accidental extubation so it was an issue for them too...We had a long phone interview with a physician at University of Pennsylvania [They were working on the same problem] (*OBS/NEO Respiratory Therapist 1*)

The work was a quality assurance project, with support from the corporate quality department (unrelated to the QA committee in OBS/NEO) and training sessions and roll out were done with their help. At the time of the interview, the project seemed to be a success.

We're now at 135 days today and when we tracked and looked...We went 133 days between the last extubation to the next accidental extubation, the longest stretch we ever did...so now we've passed it...(*OBS/NEO Respiratory Therapist 1*)

**Feedback - OBS/NEO - moderate** Notwithstanding the feedback of having a reported problem fixed (the best feedback possible), informing the reporter was still challenging. Staff meetings were a way of disseminating information, and other feedback also occurred occasionally, especially if the reporter was invited to share his/her viewpoint at a QA meeting. Additionally, there was a bi-annual newsletter that went to the department (including OBS/NEO) called "Closing the Loop", but due to its general dissemination, individual reporters mentioned appreciating receiving feedback: "I know there's that Closing the Loop Newsletter that goes around but it's very general... As far as us reporting our own thing I don't think it's very specific about that..." (*OBS/NEO Bedside Nurse 2*)

Those in positions who could initiate more feedback to reporters realized this weakness of the system, and had plans to improve this aspect of incident reporting. "Something I think we could do better at is closing the loop with staff. So [we need to] figure out how to do that and that's something that I'd like to work on over the next year to do that a little bit better." (*OBS/NEO Nurse Leader 9*). A physician stated, "if they took the time to put the information in [the IRS], somebody [should then] take the time to give the

information back” (*OBS/NEO Physician 4*). Most participants believed that there was room for improving feedback to reporters.

***Summary - incident reporting, analysis, learning from reporting and feedback-OBS/NEO.*** OBS had some experience with a previous IRS, whereby non-punitive reporting including near misses was an ingrained practice. A team approach was common. Analysis with an individual focus was done by nurse leaders, who recommended reports with a system focus (most reports, according to the nurse leaders who first reviewed the reports) to the multidisciplinary pre-screen committee that reviewed incidents. Reports with systemic learning potential were often brought forth to the multi-disciplinary departmental QA committee, where they were reviewed and typically policy changes were made. Changes could be traced to the IRS. The department had a newsletter that highlighted the IRS, but individual feedback to reporters was a priority for those who could effect local change.

A summary of the differences in incident detection, analysis, learning and feedback between GIM and OBS/NEO is shown in Table 2.

Reporting Aspect	GIM	OBS/NEO
Incident detection	Predominantly nurses Predominantly outcome based (falls and medication errors)	Team approach Outcome and near miss based
Analysis	Individual nurse leader investigation Individual physician review to determine preventable harm	Individual nurse leader investigation Multidisciplinary pre-screen committee review Larger multidisciplinary QA review for policy type issues
Learning through reporting	Feedback to individual nurses through “teachable moments” Ambiguous linkage to incident reports (e.g. M&M rounds)	System focus Clear linkage to incident reports (e.g. Accidental extubation project in NICU)
Feedback	Staff meetings (nursing)	Staff meetings, bi-annual newsletter, occasional reporter participation in QA meeting

Table 2 - Comparison of the incident reporting process in GIM and OBS/NEO

### Factors that Influence the IRS Practices in GIM and OBS/NEO

The main influences on IRS use were seemingly the threat of litigation, the introduction of the IRS and interprofessional training. In what follows, we compare how each of these influences affected incident reporting practices in the two departments.

***Influence of litigation.*** In GIM, physicians spoke more than nurses about the legal influence on their overall practice, and their reporting practices in particular, indicating that the threat of a lawsuit was one of the barriers to physician reporting.

That might end up in the courts if you get [a] litigious family ... you can always get a lawyer who will make something of it. So [doctors] tend to then failsafe... there is a certain amount of defensive medicine ...(*GIM Physician 5*)

[Doctors] aren't really sure what's gonna happen to [reported] information and I don't know if they're worried if it's a medical/legal issue...(*GIM Physician 4*)

The threat of litigation influenced physicians' practices in GIM as there was concern that reported information could lead to legal proceedings. However, the threat of litigation was stronger in OBS/NEO.

In the adult world [the window of litigation] is 3 years. So I could have something go wrong in that world and outlive the issue. But in the neonatal world ...our window of litigation is age of majority plus 2 years... it can come back to haunt you in 5 years, 7 years, 10 years and if you have no record of it, now what? (*OBS/NEO Respiratory Therapist 2*)

The statute of limitations, or how long a complainant has to launch a lawsuit, was far longer in OBS/NEO than in GIM. This was one of the factors that influenced reporting practices. If there was no record of an event, and a lawsuit was launched, the practitioner would be in a difficult position. Furthermore, the amount of money in the OBS/NEO lawsuits was substantial.

Our specialty is the most litigious specialty ...Of the Canadian Medical Protective Association [payouts], close to about 28% [are from] OBS/Newborn Care mostly OBS ... When the cases do go bad, the outcome is a lifetime of disability. That's why our staff here has embraced this system-related issue for the risk management far earlier, far more aggressively than some others (*OBS/NEO Physician 5*)

In contrast to GIM where incident reports could be seen as a trigger to lawsuits, physicians in OBS/NEO expressed a different view.

The lawyers aren't gonna go after you just because you've had an incident report. The lawyers are gonna go after you because the patients have started the process because something bad has happened. So better that we do the incident reporting so bad things don't happen, I think is the kind of way that we look at it. (*OBS/NEO Physician 7*)

The threat of litigation is seemingly proportional to the use of the reporting system – the lower the threat, the less the reporting system is used (GIM), and the higher the

threat and the longer the period of potential threat, the more the reporting system is used (OBS/NEO).

***Introduction of the IRS*** The way the IRS was introduced to leaders and to the front line staff in the two divisions was revealing. In GIM, a Nurse Leader was invited to help customize the system for use in the unit, but the initiative came from the IRS team.

How was it introduced? I absolutely remember. I got invited to a meeting that was 4 hours long and I had no clue what it was about, is how I was introduced to the whole thing. But then teaching came out after that where we were part of the pilot actually helping to formulate the actual form that's online now. So they would ask us what we thought. What information needed to be in there? What would make it easier for the staff filling it out? (*GIM Nurse Leader 2*)

The corporate project team invited contributions from those whose divisions were going to be affected on how the project would look in their area. As such, while there may have been some customization of the IRS for GIM, it was at the invitation of the corporate project, although it is clear from the quotation that this contributor was not initially in the know regarding his/her role. The requirements for the customization of the IRS for GIM were discovered and incorporated after the division was invited to trial the IRS in a pilot project.

Another aspect of how the IRS was introduced involved training the front line staff. In GIM, this training focussed on the logistics of reporting – how to access the reporting form, what boxes to fill out and where to click to submit. This training was provided as part of the roll out, and was given by the corporate team.

I believe I just got a little in-service at the hospital...very quickly showing us the screens and what information needs to be inputted and that's basically I think all that I remember really getting out of it. (*GIM Bedside Nurse 2*)

There might have been myself [and] just 3 or 4 people sitting around a little corner of a computer and she just showed us how to enter in an adverse event. *(GIM Bedside Nurse 12)*

*(Interviewer)* In your training that you had received when it was rolled out, was what should and should not be reported covered?

*(GIM Bedside Nurse 13)* I don't recall that they had gone into saying what should and shouldn't be reported.

Those on the unit who train the incoming nurses continue to train on the logistics of reporting

*(GIM Nurse Leader 5)* They actually [get] training in corporate. They also have to do an online module before they can have access to [the IRS] I do fill in the holes of showing them what screens to go to, how to work through the menu.

*(Interviewer)* In your training do you ever talk about what qualifies as an incident? *(GIM Nurse Leader 5)* I don't, no...[they] probably made an assumption that the [new nurses] would know what an incident is.

Overall, GIM was invited to a meeting by the corporate project team to customize their form, and the corporate and local training of users focussed on the mechanics of entering a report.

In contrast, OBS had their previous experience with their locally owned IRS, and was proactive in contacting the corporate project to ensure their known, specific needs were taken into account before the software came to their department.

So when the hospital started talking about a [corporate IRS] system I offered to us to pilot it because we had [the OBS IRS] and we wanted to influence what the new system was gonna look like and see what it could do for us. And originally the hospital wasn't going to customize it. "It's standard for everybody and it should fit" and we said "we can't, it's got to be tweaked in some areas. A lot of it can be standard but some of it needs to be tweaked". *(OBS/NEO Nurse Leader 1)*

So we spoke with [the IRS] team in terms of putting into [the IRS] things that would usually be associated with adverse events in obstetrical cases. So these...we've classified them into system indicators or communication indicators or physician specific indicators and our broader classification would be a maternal or a fetal indicator. *(OBS/NEO Physician 1)*

Guided by the previous IRS OBS specific system, this local ownership continued in the way the present IRS was designed for OBS use.

Training also differed in OBS. Front line staff instruction focussed on more than only how to log a report.

We're (1) trying to prevent something from happening again like a near miss or (2) helping to deal with certain situations better or how could we improve...how can we fix this in the future? And that's the main thing that stood out when doing the training. *(OBS/NEO Bedside Nurse 4)*

This nurse began after the official roll out, and was trained on the unit.

When I came in my Educator [went] over what is an [incident] and what we should be completing [a report] for. *(OBS/NEO Bedside Nurse 6)*

While the detail of the reporting method is important, these interviewees did not mention that aspect, but did mention the reason to report. Obviously the mechanics of how to enter a report must be learned at some point, but the training in OBS focussed as well on the reasons to report.

The introduction of the IRS differed in GIM and OBS. The customization of the IRS for these two departments happened differently. In GIM, the process was initiated by the corporate project team in a top-down approach, and the customization of the IRS form came about through experience in a pilot project. The OBS division approached the corporate project with their pre-determined customization needs in a bottom-up fashion. The training also differed between the departments, with GIM focussing on the logistics of filling a report, and OBS going beyond this to cover the rationale for reporting.

***Influence of interprofessional training*** Various individuals in GIM were patient safety leaders, and individual practitioners had gone to conferences, and trainees (e.g. residents, nurses) were being increasingly exposed to patient safety in their residency and

training, but there had not been a coordinated, systemic effort to educate GIM practitioners about IRSs. When looking at Neonate care separately from Obstetrics, this department shared the non-specific patient safety training experience with GIM –there seemed not to have been a deliberate effort to train the division. However, the issue was different in OBS.

Due to the threat of costly litigation, the Society of Obstetricians and Gynecologists of Canada played a key role in training labour and delivery professionals in patient safety, and this organization developed a course in 2002 called Managing Obstetrical Risk Effectively, or MORE OB, based on knowledge and procedures in the aviation industry. (MORE OB is now owned by Salus, a private company.)

So the brilliant thing with MORE OB is its standard obstetrical content that any care provider, nurse or physician can review and access; it's a pre-test and post-test for knowledge... They picked all the high error and litigation issues that are common in Obstetrics; shoulder dystocia, post-partum haemorrhage, to give you examples and they created tools. (*OBS/NEO Nurse Leader 1*)

But the content of MORE OB was not the only “brilliant” piece. There was a major portion on interprofessional collaboration. It provided “safe spaces” for differing opinions:

And everybody has a right to ask a question and it is encouraged and fostered and learning beside each other. We shared each other's viewpoints on how we cared and how we saw a case. And that was really good because both team members be it medicine or nursing commented about how good it was to have that sharing going on (*OBS/NEO Nurse Leader 7*)

MORE OB introduced multidisciplinary simulations to the obstetrical teams, which formed the basis of present-day simulations. It also had a substantial component on tackling the hospital hierarchy; during the didactic training sessions, nurses and physicians had the opportunity to teach each other, and everyone got the same message at the same time:

That was a wonderful program. It was phenomenal in the teaching aspect of it, it was great in the interdisciplinary aspect of it as getting us to all work together as a team. It was great to show the obstetricians our role in it all, and for us to see the obstetricians' role. So I loved it. (*OBS/NEO Bedside Nurse 1*)

MORE OB also provided the participants with specific communication tools to help flatten the hierarchy in daily work, as expressed by physicians and nurses.

We've also empowered the nursing colleagues as well as the whole allied healthcare colleagues to go directly to the most responsible staff [physician] or designate...In the past regimented nursing model, they would just communicate within themselves and then one person would communicate. (*OBS/NEO Physician 5*)

We're supposed to contact the junior resident first and then the senior resident and then the staff. If it's a big emergency, I don't even bother with the junior resident ... I go straight for the senior and if I don't like the way they're treating the case, well I go to staff. (*OBS/NEO Bedside Nurse 5*)

The MORE OB training helped establish a culture of patient safety, as a physician stated, "I think with a change in culture with the MORE OB we became a bit more proactive" (*OBS/NEO Physician 2*). This was echoed by a midwife.

Blameless, everybody has a voice, everybody has a job to report, and everybody has a role in this discussion. It's in camera, it doesn't go out the door other than positive things as to what we could change. It's not finding blame it's everybody critically analysing something objectively in a collegial manner with the patient's safety as the driving force. (*OBS/NEO Midwife 2*)

As mentioned, the programme was limited to labour and delivery – neonatology was not a participating division in the training. However, some of the tools of MORE OB were part of the neonatology department too: "[The neonatologists] have told us several times, if you have an issue with a physician on nights give them a call 24/7" (*OBS/NEO Respiratory Therapist 3*).

Interprofessional training and culture were a substantial influence on reporting practices in OBS/NEO.

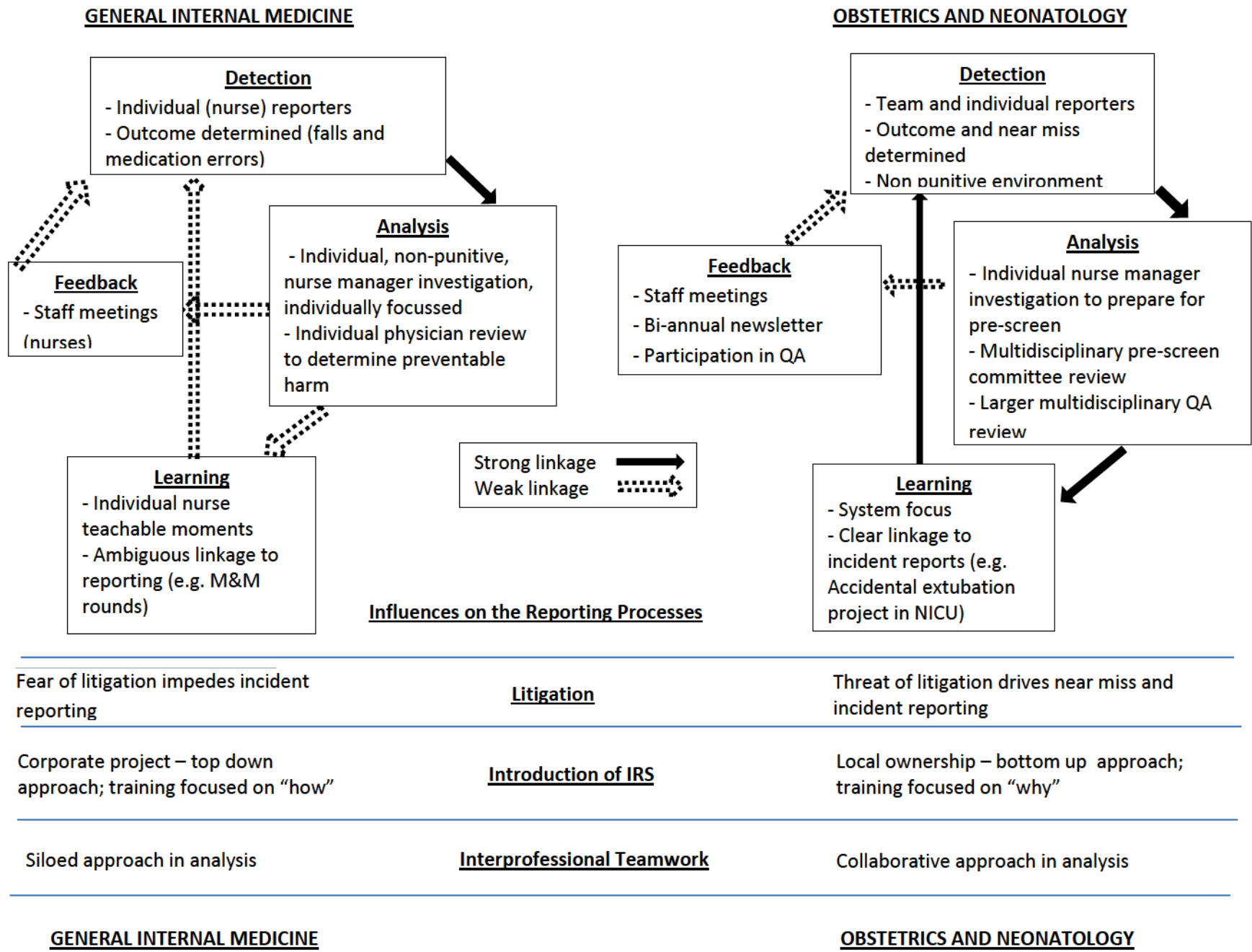
Table 3 summarizes the main influences on how the IRS was used in the two divisions.

<b>Influence on IRS use</b>	<b>GIM</b>	<b>OBS/NEO</b>
Threat of litigation	Moderate; had an inhibiting effect on, especially, physician reporting	Very high; had encouraged the domain to be proactive, and embrace IRS use
Introduction of IRS	Top down, customization asked of GIM Instrumentally focussed training – how to report	Bottom up, customization asked by OBS Training focused on reasons to report
Interprofessional training	Minimal interprofessional training	MORE OB (in OBS division), which gave rise to several safety practices including the OBS specific predecessor of the current IRS

**Table 3 - Comparison of the influences on the IRS process in GIM and OBS/NEO**

A model of the use of the IRS and its corresponding influences is depicted in Figure 1.

Figure 1 - A descriptive model of the incident reporting processes in GIM and OBS/NEO, including influencing factors



## DISCUSSION

This study focussed on the differences in incident reporting, by examining incident detection, analysis, outcomes and feedback in two divisions: GIM and OBS/NEO. It also analyzed the factors that help to account for the differences in the two divisions. The importance of studying interventions to understand the underlying factors that enable success is growing in importance in patient safety generally (Bosk, Dixon-Woods, Goeschel, & Pronovost, 2009; Dixon-Woods, Bosk, Aveling, Goeschel, & Pronovost, 2011; Dixon-Woods, Leslie, Tarrant, & Bion, 2013). This comparative study was undertaken in one hospital; hence the higher organizational level influences were common. Nonetheless, there were major differences in the approaches in the two divisions.

***The Incident Reporting System*** In terms of detecting, the main reporters in GIM were nurses, and the main items reported were falls and medication errors. As discussed, these are outcome driven reports – the fall or the medication error happened, and that is the reason the report is entered into the IRS. In OBS, the reporters were of various professions, and the reported items were largely pre-determined on their locally-owned dropdown list, many being near miss situations. The near miss reporting has also been called process reporting, as the process triggers the report, not the outcome. The contrast between an outcome and process reporting system has been studied by Nuckols, Bell, Paddock, & Hilborne (2009). In studying the content of nearly 4000 reports from an academic and community hospital, they found that

In terms of their potential usefulness to improving patient safety, the process-oriented reports were far better for determining incidents' preventability and identifying contributing system and provider factors. Outcome-oriented reports were better for identifying patient factors....Hospitals should specify which undesirable outcomes, if any, should be submitted to their voluntary incident reporting systems and should train staff to focus on reporting problems with care and describing those problems in detail.(Nuckols et al., 2009, pp. 143, 144)

When seen on this scale, GIM's reporting is most similar to the outcome oriented reports and OBS/NEO is most similar to the process oriented reports, whereby Nuckols et al. clearly state that the process oriented reports have a greater potential to improve patient safety.

In GIM, nurse and physician analysis was undertaken independently – a siloed approach, similar to a previous study (Cunningham & Geller, 2012) described earlier. In Obstetrics, only the first stage of analysis was undertaken independently by a nurse leader, and all subsequent stages (pre-screen and QA committee) were undertaken interprofessionally. OBS/NEO had maintained a collegial environment, focussed on change and learning, similar to a process described earlier in a respiratory therapy setting (Bush, 2010) and an accident and emergency department (Tighe et al., 2006). Unlike the GIM model of individual analysis, the Obstetrics model of layers of interdisciplinary review allowed multiple voices to be heard, culminating in a department level QA interprofessional review.

Feedback in IRSs is a common problem generally, not only in healthcare (Sanne, 2008; Summers, 2009), and it acts as one of the more significant barriers to reporting in healthcare (Brubacher et al., 2011; Noble & Pronovost, 2010). However, OBS/NEO's newsletter, an analysis process inclusive of the reporter (if the reporter chose to participate in the QA meeting), and most especially interventions linked to IRS reports have made progress on ensuring reporter's voices were listened to. In GIM there had not been much progress to ensure the reporter's experience was valued. Benn et al., (2009) studied feedback in healthcare IRSs, and found a multitude of ways it was practiced. However, "Getting the content of feedback right in terms of the message it conveys regarding how incident data will be used, the level of anonymity provided to reporters and the potential consequences of disclosing errors and near misses through

reporting are all critical issues that can impact upon reporting culture” (Benn et al., 2009, p. 20). It is recommended that both GIM and OBS/NEO could improve their feedback processes, in order to ensure a more effective IRS.

The examples on learning from IRS reporting were also different between the divisions. In GIM, nurses often received the individual feedback on their performance through “teachable moments”, which may have led to individualized learning. Specific improvements based on the IRS data were not mentioned by interviewees in GIM; in fact, the assumption was often that the system was for data collection and/or that reports were ending up in a figurative black hole. However, physician M&M rounds may have used the IRS to populate the cases discussed, but the link between M&M rounds and the IRS was tenuous.

In contrast, OBS/NEO had many examples of learning that resulted directly from the IRS. For example, the accidental extubation project that the respiratory therapist spearheaded in OBS/NEO began with a recommendation to track the accidental extubations through the IRS. With a focus on reporting, and the commonality of the problem at other respected NICUs, the IRS became a more reliable way of knowing there was a problem, and that the intervention was successful. This hospital’s accidental extubation problem was known through analysis of incident reports, providing a clear linkage from the incident reports to a seemingly successful intervention.

***The Influences:*** Litigation influenced incident reporting in both divisions, but in different ways. The GIM influence is the one traditionally reported in the literature: reluctance to report for fear of being sued or losing one’s licence (Dekker, 2007a; Leape, 2010), although this is a bigger issue for physicians than for nurses (Hewitt et al., 2014). However, as our data showed, litigation had the opposite effect in OBS/NEO. The threat of litigation is exceedingly high in

these fields, and this serves as great motivation to avoid a lawsuit, and reporting practices are well established (Florea et al., 2010; Waring & Currie, 2009). However, this did not come about without some dedicated effort, specifically in training.

The introduction of the IRS in the two divisions, in terms of both customization and training on the IRS, may have been influenced by local ownership and the type of interaction with the front line practitioners. OBS had customized their form based on their previous experience – they knew what they wanted, and were able to approach the corporate project with their needs. Furthermore, they trained their users on “why” to report, instead of restricting the training to how to enter an event. This type of local ownership was termed “co-optation” by Waring & Currie (2009), where the receiving group of a corporate project had the skills necessary to customize the corporate project to suit the needs of the local group and the larger organization. In GIM, with comparatively little local ownership of the system, the IRS was regarded more of a corporate project in which the customization of the IRS was invited by the corporate team, the training was corporately given and the training focussed principally on “how” to report. The importance of local ownership has been seen in the use of checklists; the World Health Organization endorses customizing the surgical safety checklist for local applicability (WHO, 2009), as has the Ontario Hospital Association (Ontario Hospital Association, 2010). The success of the Central Line Associated Blood Stream Infection (CLABSI) initiative was in part due to the customization of the checklist (Dixon-Woods et al., 2011). Local ownership was a key factor in the introduction of the IRS in OBS, but not in GIM.

Another key concept was the interaction with the healthcare professionals. If the corporate project allows the front line team to experiment and implement the intervention without being micro-managed, the front line team will be more interested in shepherding the

intervention to be successful. As Reay et al., (2013) found in their case study of institutional change, “When managers are able to encourage professionals to try new practices, and thus engage in quasi-independent meaning-making, the possibility of significant and sustainable changes in the nature of work becomes more feasible” (p987). This was also seen in the Michigan Keystone project, “The vertical core must focus on enabling teams to make changes, figuring out why some things are hard for staff, and making them easier to do” (Dixon-Woods et al., 2011, p. 195). While in this study, GIM was asked to participate in the introduction of the IRS, their contribution was driven by the corporate project. In contrast, OBS had a far more active role in driving how the IRS was introduced in their department, while still working within the wider framework of the corporate project. The type of involvement of GIM and OBS differed, which contributed to how the IRS was subsequently used in each division.

It is difficult to overestimate the influence of the MORE OB training, which has been shown to increase obstetrical outcomes and decrease insurance rates (Milne, Walker, & Vlahaki, 2013). It had interdisciplinary teamwork as part of its fundamental philosophy. Interdisciplinarity has been identified as a major area of patient safety research where more improvement must be made (Connor, Ponte, & Conway, 2002; Shekelle et al., 2013). Weaver et al. (2013) undertook a systematic review and found that interprofessional team training and/or communication initiatives are core elements of successful interventions to improve safety culture. Siassakos et al. (2013) studied Obstetrical interventions in team training, and found that early, direct and closed loop communication was critical for successful teams. Obstetrics is known for their leadership in team training (Cornthwaite, Edwards, & Siassakos, 2013). Pronovost, Holzmueller, Ennen, & Fox (2011) note that “The signs are hopeful that obstetrics and gynecology can make significant progress; this department is leading the field in team

training”(p8). Obstetrics interventions also include concepts used in the aviation industry such as crew resource management (Mann, Marcus, & Sachs, 2006) and simulation (Daniels & Auguste, 2013; Lewis, Strachan, & Smith, 2012). Expanding the M&M meeting composition is another way to assure interdisciplinary collaboration. “If the team is provided a sufficiently diverse set of backgrounds, viewpoints, skills, and interests, then hidden assumptions are exposed; a broader repertoire of options, tactics, and tools is made available; tacit knowledge is made more explicit; and more interpretations and preferences are expressed”(Wears & Karsh, 2008).

Team training has been seen as a critical ingredient in other patient safety initiatives. The very successful Michigan Keystone project that successfully tackled the problem of central line associated bloodstream infections included an interdisciplinary approach as one of its key factors.

Local improvement teams in the participating units were designed to not be dominated by any single profession but to have representatives from all stakeholder groups...Frequent interactions, reciprocal communication, and decentralization increase the social pressure to cooperate by reducing the social distance between members of unequal status and authority and strengthening the acceptance of group norms by the group members.(Dixon-Woods et al., 2011, p. 182,183)

The importance of team training is a key factor for patient safety and incident reporting.

A specific dimension of team training is empowerment of those in the healthcare hierarchy who traditionally have not had a strong voice. MORE OB addressed this directly, ensuring that nurses, and later allied health professionals, were able to speak up if they felt something was going wrongly. This was another key component of the Michigan Keystone project, but this tool is very challenging to bring to the larger healthcare community. Reflecting on the participating hospitals in the initial Michigan Keystone project, Pronovost wrote

Perhaps most concerning is the response from nurses in participating hospitals when asked: “if a new nurse in your hospital saw a senior physician placing a catheter but not complying with the checklist, would the nurse speak up and would the physician

comply?” The answer is almost always, “there is no way the nurse would speak up.” Doubly disturbing, physicians and nurses uniformly agree patients should receive the checklist items. (Pronovost, 2010, p. 204)

Empowering nurses is a critical aspect of patient safety, but it is far from trivial to sustain in routine healthcare practice.

## **CONCLUSION**

IRs, while a key tool in patient safety, have been the subject of many studies, mainly focusing on reporting (or underreporting). This study of the whole process of incident reporting from detection to learning provides a more complex view. Furthermore, this study compared the processes at two hospital divisions, and revealed both the similarities and the differences between them. The model provided in Figure 1 portrays these processes such that the two divisions can be directly compared, and also depicts the factors underlying the differences in the reporting processes.

Typical studies of IRs focus on getting more events into the system (Brubacher et al., 2011; Kreckler et al., 2009; Noble & Pronovost, 2010). However, more recent studies suggest that the number of reported events in an IR is not a metric by which the system should be judged (Pham et al., 2013). Pham et al state that IRs can be used to address local problems, and aggregate information for uncommon conditions. They recommend understanding and enhancing the analysis and system changing aspects to IR, and providing meaningful feedback to the reporters who detect and submit reports. This study enhances understanding of these issues, by going beyond asking why people report or do not report and that interrogating the analysis and learning processes is integral to a successful IR. This study also demonstrated a case of an uncommon condition (the accidental extubation of neonates) whose local existence was confirmed through the use of the IR.

Many issues in safety are only analyzed once errors are found, or once something has failed (Hollnagel, 2013; Le Coze, 2013; Lundberg, Rollenhagen, & Hollnagel, 2009; Stoop & Dekker, 2012). This study was not prompted by a failure, nor was it an analysis of a system that was dysfunctional. The study of the normal, of the unremarkable, with an aim to explain the processes and understand the underlying dynamics is a new approach in safety (Dekker & Pruchnicki, 2013a; Dekker, 2007b). Studying when “things go right”, or safety II, is only now earning recognition in safety circles (Eurocontrol, 2013; Hollnagel, 2014; Woodier, 2015). “Safety II is proactive, continuously trying to anticipate developments and events. It assumes that things, whether they go right or wrong, basically happen in the same way, regardless of the outcome”(Dekker, 2010, p. 239). This study helps promote this new focus in safety research by studying an IRS that seems to be functioning well.

The well-known Michigan Keystone initiative to reduce CLABSI (Central Line Insertion Bloodstream Infection) infections is a good case study of looking at a successful project to try to understand why it worked (Dixon-Woods et al., 2011), and why a subsequent replication did not (Dixon-Woods et al., 2013). In these analyses, the authors note that the initiative is often trivially attributed to a short list of items, notably a checklist (Bosk et al., 2009), which is an unfair depiction of the complexity of relationships and interactions that account for the programme’s success. Our study adds to this approach, by looking at the normal functioning of an IRS, with an aim to investigate factors that could account for how and why the system functions as it does in the two departments. In so doing, oversimplification of the factors was avoided, yet a concise explanation of why the IRS functions as it does was given.

This study has limitations. It took place in only one hospital, and was primarily restricted to interviews, albeit a wide variety of practitioners were interviewed to maximize the diversity of

opinions on the IRS. This diversity exists in other healthcare environments (ICU, radiotherapy, surgery), so the views on the IRS and its functioning in the divisions are likely found in other healthcare domains. There may be other successful structures of an IRS that this study did not capture, given its limitation to two divisions. The findings from the divisions studied might not easily transfer to similar divisions in other hospitals, with different contextual factors. This study may not have captured all of the factors that influence the reporting processes in the two divisions examined, although those that were not described are likely to be less influential than the themes presented.

Practical implications of this study can be summarized in three broad categories. First, the importance of the interprofessional training seemed to be highly significant. Nembhard & Tucker (2010) talked of healthcare traditionally using autonomous learning (experientially based) as opposed to deliberate learning (through specific training), and found that interdisciplinary collaboration promoted deliberate learning. This deliberate learning – interdisciplinary didactic sessions coupled with practice through simulations is quite costly, and serves as a non-trivial barrier to running courses like MORE OB. However, recently, medical insurers have paid for front line staff to participate in simulations, anticipating that the training will result in safer care, and thus fewer claims (Arriaga et al., 2014). Medical insurers could play a more active role in encouraging these interprofessional learning opportunities.

A second area of practice implication is that of diversity. In his analysis of the values of highly successful healthcare organizations, Bohmer (2011) highlights the importance of self-study and seeking dissenting views, the latter encouraged by Tucker & Edmondson (2003) and Pronovost (2010), especially encouraging nurses to speak up. The idea of having diverse opinions in groups responsible for patient safety is a key aspect to the success of the CLABSI

Michigan Keystone project, in their conception of a CUSP (Comprehensive Unit Safety Programme) (Pronovost, Marsteller, & Goeschel, 2011). Diversity is also encouraged in M&M rounds (Wears & Karsh, 2008). The review of events by more than one profession allows a much richer understanding and well vetted recommendations for improvement (Bush, 2010; Tighe et al., 2006). “Diversity of narratives can be seen as an enormous source of resilience in complex systems ...The more angles, the more there can be to learn.”(Dekker & Pruchnicki, 2013b, p. 201) Encouraging more than one opinion and discussing with an aim to understand could help those involved in the IRS process bring a more holistic understanding to reported incidents.

A third area of practical implications deals with feedback. Leveson postulates that the main problem with safety in modern times is the lack of control or feedback loops allowing for those who initiate an action to learn its effects before an ultimate outcome (Leveson, 2011). Feedback has been identified as a critical IRS function (Donaldson, 2005), and the lack of feedback is seen as a barrier to reporting, as many IRSs fall short by not informing reporters of the effect of their efforts (Benn et al., 2009; Brubacher et al., 2011; Noble & Pronovost, 2010; L. Wallace, 2006). This study adds to the literature in emphasizing the importance of feedback in IRSs, and suggests the importance of ensuring that feedback to the reporter is made an integral function of the IRS.

Finally, IRSs continue to be seen as important tools to improve patient safety. Yet, as has been shown, these systems can fall short of achieving the intended objectives. It is hoped that the findings from this study will be useful to academics and practitioners as they enrich their understanding of IRSs to enhance patient safety.

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## **Chapter 6 –Discussion and Conclusions**

In this final chapter of the thesis, I review the main themes that bridge the manuscripts, report on the contributions of this study, as well as its limitations. The thesis concludes with recommendations for practice and areas for future research.

### **Themes that bridge the manuscripts**

The four manuscripts that comprise the thesis are

- Self and Peer Reporting
- Fix and Forget or Fix and Report
- Double Checking
- Comparison paper

From these papers and the overall study, a number of themes can be highlighted.

#### **Interprofessional Relations**

Interprofessional relations and practices are a main theme of this thesis. It was shown in the Self and Peer Reporting paper that reporting across professions (insofar as nurses and physicians in GIM) is generally not practised. Peer reporting is typically restricted to one's profession. This contrasts with the practices in OBS/NEO (Comparison paper), whereby the importance of reporting comes ahead of any concerns about interprofessional reporting. This is most likely due to the MORE OB training that those in Obstetrics had received. This interprofessional approach extended to reviewing the incident reports in Obstetrics, whereby teams of professionals would contribute their perspective in a non-threatening manner in order to understand the context of the incident report more fully. This interprofessional approach is the main ingredient in John Hopkins' CUSP initiative (Pronovost, Marsteller, & Goeschel, 2011), and has been suggested to enhance M&M rounds (Wears & Karsh, 2008). The issue of empowered nurses, and how it is practiced - spoken of in the Comparison paper – is very informative. Asking nurses in a peer review if they would alert a physician that the

physician was in non-compliance with a checklist, “the answer is almost always, ‘there is no way the nurse would speak up’” (Pronovost, 2010, p. 204). Diversity is becoming one of the most important factors in healthcare and safety generally, as mentioned by Dekker. “With diversity, a system has a larger number of perspectives to view a problem with and a larger number of possible responses” (Dekker, 2011). Interprofessional relationships are a means to this end (Dekker, 2011; Dixon-Woods, Bosk, Aveling, Goeschel, & Pronovost, 2011).

Interprofessional relations are very important to incident reporting, and figure strongly in this thesis.

### **The Importance of Local Context**

Another strong theme running through all the manuscripts is the importance of the local context. This is seen in the Self and Peer Reporting paper: how individuals perceive a situation is shaped not as much by organizational messaging (of incident reporting systems being no blame-based, for example), but by a complex interaction of the person’s experience, training, and group norms at the local level (Labianca, Gray, & Brass, 2000; Weick, 1995). Further, the more the local level is involved with an organizational initiative, perhaps in a leading role, the more likely the initiative will be successful (Dixon-Woods et al., 2011; Reay et al., 2013). This was described in the Comparison paper, whereby Obstetrics ensured the suitability of the incident reporting tool for their area by asking for customization. This same local control has been seen in the context of the World Health Organization Surgical Checklist (Ontario Hospital Association, 2010; World Health Organization, 2008). The importance of recognizing and incorporating the local context is a strong theme in this thesis.

## **Feedback**

In the initial recommendation of the WHO to establish incident reporting systems, feedback was recognized as a very important feature of such systems (Donaldson, 2005). The lack of feedback has been found to be a significant barrier to reporting (Brubacher et al., 2011; Jeffs, Berta, et al., 2012; Noble & Pronovost, 2010). The Fix and Forget or Fix and Report paper mentioned reporters' perception of the black hole whereby reporters did not receive any feedback; the message is much stronger in the Comparison paper, where feedback is directly addressed. In the Comparison paper, the one shared weakness of both divisions was feedback to the reporter. The Comparison paper also highlighted how damaging the lack of feedback can be for those on the front line, and how rewarding it can be when it does occur. Feedback in reporting systems has been studied in the UK (Benn et al., 2009; Wallace, Spurgeon, Benn, Koutantji, & Vincent, 2009; Wallace, 2006), and while its importance was continually highlighted, hospitals were challenged to provide feedback meaningful to the reporter. Feedback of incident reporting systems is a significant theme in this thesis.

## **Questioning the Status Quo**

Encouraging more reflection and skepticism of 'the way things have always been' is recognized as one of the ways that patient safety will improve (Bohmer, 2011; Øvretveit, 2011). This has been a strong theme in this thesis, with the Double Checking paper critiquing the stand alone practice, and suggesting that double checking must be used in conjunction with other methods, that it is not infallible, and that it requires training and a specialized environment. In Fix and Forget or Fix and Report, the idea of only realized incidents (or outcome determined reports) is questioned. The paper suggests the need to report not only harrowing near misses, but more mundane near misses and hazards. The

Comparison paper goes beyond typical incident reporting studies trying to get more reports into the system (or asking why reporting is not taking place), and looks holistically at the reporting process. Challenging the status quo was the genesis of the successful CLABSI initiative (Pronovost et al., 2011), and the lack of challenge of the status quo was recognized as a factor in CLABSI not successfully replicating in the UK (Dixon-Woods, Leslie, Tarrant, & Bion, 2013). Overall, questioning the status quo was a major theme in the papers in this thesis.

### **Prevention**

This is a central theme in the papers and the thesis generally. In the Self and Peer Reporting paper, the importance of organizational learning was stressed. This was further developed in Fix and Forget or Fix and Report, whereby impediments to sharing information, encouraging organizational learning and promoting prevention were identified. In Double Checking, suggestions were made to make the practice a more robust tool that would allow the prevention of problems. And the Comparison paper highlighted how Obstetrics embraced near miss reporting and process as opposed to severity and outcome determined reports. Near miss reporting – a challenging practice in health care generally - was highlighted in Fix and Forget or Fix and Report and the Comparison paper. “Near misses are poorly understood by health care professionals. When near misses are reported and analyzed, it often uncovers system deficiencies that when corrected lead to safer patient care” (Roblee, 2014). These system deficiencies and hazards could be mitigated or eliminated allowing for better prevention. Safety II is also in line with this, “Safety II is proactive, continuously trying to anticipate developments and events” (Dekker, 2011). Prevention is a strong theme in this thesis.

## Contributions

This study makes a number of contributions. It ties in various theories from safety and cognitive psychology. Safety concepts, such as Reason's Blunt and Sharp End and Latent Pathogens (Reason, 1997, 2000), were introduced in the Self and Peer reporting paper, as was the cognitive concept of Framing (Chreim, 2006; Labianca et al., 2000). First and Second Order Problem Solving (Tucker, Edmondson, & Spear, 2002; Tucker & Edmondson, 2003) were applied to the Fix and Forget or Fix and Report manuscript, as was the safety idea of Normalization of Deviance (Vaughan, 1996; Waring & Bishop, 2010). Collective Efficiency Thoroughness Trade Off (Hollnagel, 2009) and In Family (Accident Investigation Board, 2003) concepts were applied to Double Checking, and Safety II (Eurocontrol, 2013; Hollnagel, 2014) and Diversity (Dekker, 2011) to the Comparison paper. Overall, various relevant concepts and theories that had rarely been applied to healthcare and patient safety were used, which is a contribution of this study.

Patient safety, and safety writ large, often focuses on occurrences after an accident, or on finding non-compliances and non-conformities. Prevention, by involving the front line staff, is a relatively new concept in patient safety, popularized by John Hopkin's University's CUSP (Pronovost, Holzmueller, et al., 2006), which is now at TOH (The Ottawa Hospital, 2015). By making prevention a central theme in this thesis, I contribute to the emerging conversation on this important topic.

Interprofessional training is a significant finding from the Comparison manuscript. This training is known in healthcare, but is more familiar in "postvention" areas, such as disclosure (Espin, Levinson, Regehr, Baker, & Lingard, 2006; Jeffs et al., 2010), incident

review at M&M rounds (Calder et al., 2014; Wears & Karsh, 2008) and incident reporting (Lindsay, Sandall, & Humphrey, 2012; Williams, Phipps, & Ashcroft, 2013). Combining interprofessional training with a prevention lens is how the SOGC came up with MORE OB, and its payoffs have been significant. Highlighting the importance of interprofessional training and practice is a third contribution of this study.

### **Limitations**

This study has limitations. It takes place in one hospital, and investigates two divisions (arguably three, if Obstetrics and Neonatology are separated). The reporting processes and influences revealed in this study reflect the findings from the departments studied in The Ottawa Hospital. Other hospitals might have different reporting systems, and different General Internal Medicine, Obstetrics and Neonatology divisions in different hospitals may have different reporting and analysis practices, and be subject to different influences. Often, researchers seek generalizability (or external validity) of a study, yet qualitative researchers do not promote being able to apply their findings generally. Instead, qualitative researchers aim to offer enough context through “rich, thick descriptions” (Geertz, 1973; Ponterotto, 2006) including extensive quotations to allow the reader to judge if the findings are transferrable to different settings (Creswell, 2009; Miles & Huberman, 1994). For example, a diversity of job titles comprised the interviewees of this study – this diversity of job titles exists in other healthcare departments (e.g, radiation therapy, intensive care unit, surgery), and the findings of the various manuscripts may well transfer to these other settings.

The data source is primarily interviews. One might critique such a study, as there is little opportunity to validate the veracity of the information obtained from the interviewees. The findings of this study, however, were generally grounded in the worldviews of the participants as obtained in interviews. Lincoln & Guba (1994) describe that “Human behaviour, unlike that of physical objects, cannot be understood without reference to the meanings and purposes attached by human actors to their activities. Qualitative data, it is asserted, can provide rich insight into human behaviour” (p106). Instead of ensuring a common understanding against a standard, I valued the diversity of worldviews the participants shared, which formed the core of this study. It can also be argued that there may have been dynamics at work in the sites studied that were not articulated by interviewees. This is mitigated by including a variety of participants from different departments, professions and levels, and by emphasizing that the findings identify issues that pertain to the front line of incident reporting.

Further, case studies typically benefit from multiple sources, such as observation and record review, in addition to interviews. This enables the researcher to triangulate with different sources and provides a possible line of inquiry where the different sources do not agree. Not using additional data sources to triangulate is a limitation of the work. However, Creswell (2009) notes that triangulation need not be restricted to the traditional understanding of sources, but can describe where “researchers make use of multiple and different sources, methods, investigators and theories to provide corroborating evidence” (Creswell, 2009, p. 208). Taking this wider definition of triangulation, this study incorporates 85 semi-structured interviews, incorporates a number of safety frameworks, and has been extensively reviewed by two researchers.

Researcher bias is always a concern, and this study is no exception. Safeguards against this included convenience sampling of whoever was available to be interviewed (instead of pre-selecting interviewees based on position, for example), being genuinely interested in the interviewee's answers, probing extensively and pursuing interviewees' line of thinking, and being challenged by my thesis supervisor and journal editors and reviewers. My "prevention theme" lens likely guided the analysis, but this has been disclosed, so the reader can judge if the disclosure is sufficient.

### **Practical Implications**

This study yields practical implications for those involved in incident reporting and patient safety. Two broad categories of recommendations follow - those related to incident reporting and those related to patient safety overall.

To improve incident reporting systems:

1. Design feedback into reporting systems to allow the reporter to feel valued

Feedback in reporting systems is an often overlooked function. When reporting systems are developed, attention is paid to incident entry and incident analysis, but often feedback is not directly addressed. If reporters believe that their time is wasted and that their efforts in reporting are unappreciated, they will stop reporting. Deliberately designed feedback to the reporters (beyond an automatic email acknowledging reception), such as allowing the reporter to know who has seen their report, what has been written in the follow up actions, and what changes were brought about as a result of reporting is one way to ensure that the reporter can get meaningful feedback and feel valued.

2. Involve the reporter as much as possible in the review

As mentioned, the reporter would like to know that their report was worth writing. If they can be involved in the analysis phase of reviewing their report, they can help contribute details that may not be apparent in the incident report, and feel valued as a team member contributing towards patient safety.

3. Ensure training on incident reporting systems is comprehensive

While induction training often covers incident reporting systems (along with all other corporate systems employees need to know of), training on using an incident reporting system is often restricted to the training one receives shortly after being hired. Training could be extended and continual, even if informally.

- a. Encourage reporting to be part of the job – on the same level as charting or clinical skills

Incident reporting is often seen as an add on – yet something else that needs to be done on top of duties that already surpass the number of hours in a shift. This sentiment does not extend to clinical skills, nor charting. Perhaps incident reporting could be seen as a part of the job, with incident reporting at the same level as charting and non-urgent clinical skills.

- b. Make “learning potential” a criterion to report

Many reports that are routinely entered into incident reporting systems are after an event has occurred, whereby all was done appropriately, such as a patient fall, and the report may serve only to tabulate the number of falls in a certain timeframe. The learning potential from such reports may be limited. If, however, hazards and “accidents waiting to happen” were the main reports entered into a reporting system, these could be acted upon, and would allow

the reporting system to be more preventive than reactive, and may also serve as a source of pride for the practitioners who averted accidents. Shifting the focus of reporting to situations from which we can learn may help decrease the number of reports, and enable the entered reports to be more meaningful.

4. Do not view incident reporting systems as miracle turnkey solutions

As mentioned with checklists, CUSP, and many other interventions, it takes work to benefit from a tool. It is not sufficient to adopt a tool, do initial roll out training, and then expect results. Attention needs to be paid to the socio-cultural environment. The work needed to customize to diverse audiences and refine over time is worth the effort.

To improve patient safety overall:

5. Improve interprofessional training

Much of patient safety centres on communication and interprofessional relationships. The Armstrong Institute at John Hopkins University, the creator of CUSP and the approach to reducing CLABSI has stated that the gains to be made in patient safety are adaptive, not technical (Dixon-Woods et al., 2011). These recommendations focus on interprofessional training.

- a. Medical insurers and professional agencies should play a greater role in prevention

In the case of a disastrous outcome, patients may choose to sue. The Canadian insurers, the Canadian Medical Protective Association (CMPA) for physicians and the Healthcare Insurance Reciprocal of Canada (HIROC) for all other healthcare professionals pay settlements to wronged patients. These

organizations have a vested interest in having these settlements minimized, i.e. to not have wronged patients. Instead of focussing efforts after the event, and debating specifics of individual cases, the main effort could instead be preventive. These organizations could pay for interprofessional training, with the expectation that fewer claims would result, and premiums for participants could be reduced. This is being pilot tested in simulation presently (Arriaga et al., 2014), and initial results are promising. Similar pilot studies could be undertaken in Canada with the Canadian insurers.

b. Encourage simulation

Simulation has traditionally been focussed on technical skills and high fidelity mannequins and realism – but if the focus is on the adaptive interprofessional relationships, the latter can be worked on without the attention to the high tech environment. When there are slow times, a simulation could be conducted just to practice communication, handovers and other soft skills that are typically just assumed. This could be done at the local level with limited additional resources.

c. Encourage debriefing

Debriefing is often thought to be an exercise worth undertaking only after a disastrous outcome. However, most outcomes are (thankfully) not disastrous, hence the opportunity to practice interprofessional communication in a debriefing are rarely realized. If debriefings could be less severity-focussed, and seen more as an opportunity to appreciate different perspectives, they could be performed more often and serve as venues to

strengthen interprofessional relationships. This could also be performed at the unit level with limited additional resources.

6. Encourage more skepticism of the status quo

Healthcare often depends on history to plan the route forward. As such, it often continues practices because they have been around, as opposed to evidence-informed decisions. The advent of evidence based medicine being so recent in relation to the history of healthcare helps reinforce the idea that much of healthcare is based on what has always happened before. This position does not encourage questioning of the “sacred cows” or any practices that exist because of their longevity. The reason to adopt – or continue – a practice should be based on more than just “that’s the way it has always been done”. This was the genesis of the Michigan Keystone CLABSI initiative – a physician challenging the status quo (Pronovost et al., 2011). Encouraging a more skeptical approach to normal routines could well improve patient safety.

## **Future Research**

Research into the field of patient safety is vast; the recommendations for future research here are restricted to this study and the practical recommendations listed above.

1. Extend this study with data reported into the IRS

This study is based on interviews in a defined time period – the reported incidents of those time periods could be queried in the PSLs to ascertain what was reported, reviewed and actioned, to help strengthen the findings of this study.

2. Investigate the dynamics of interprofessional reviews

The analysis or review and learning processes of the departments could be captured through observations, and the practices spoken of in the interviews (e.g. flattened hierarchy, nurse empowerment) could be seen first-hand by the researcher. Data collection through observation helps provide triangulation to interview material, and contributes fine details on practices on the ground.

3. Extend this study to other departments

This study is restricted to two divisions, and could be replicated in other divisions that engage (to varying degrees) with incident reporting. Given that TOH is currently undertaking CUSP initiatives in various divisions of surgery, this might be a fruitful place to begin.

4. Investigate incident reporting beyond the hospital environment

Healthcare is not restricted to hospitals – more and more hospital services are being offered in the community, in addition to the services that always were in the community. While hospitals aim for accreditation status (whereby incident reporting systems will need to be apparent), other healthcare partners may not be so incentivized. Investigating how patient safety is realized in healthcare environments outside the hospital is a possible research area.

5. Study patients' involvement in patient safety

With the recommendations to have patients involved in incident reporting and review, such initiatives should be studied to ensure that patient safety is being enhanced. A comparative study of providers' and patients' views of incidents and safety would be a valuable addition to the literature.

## Final Thoughts

Patient safety is a wide domain, with many areas of study. This study of primarily incident reporting systems helps shed light on incident reporting – from self and peer reporting, to fixed and forgotten near misses and a comprehensive look at the entire process in two hospital divisions. It also looks at one of the status quo tools – double checking – with a skeptical lens and affords a different view of the practice. I hope that this study adds to our ever increasing understanding of patient safety, and that the field of patient safety can be oriented towards further prevention.

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## **Appendices**

Appendix A – The Consent form for the interviews

Appendix B – The question guides for the interviews



## Appendix A - Interviewee Consent Form

Consent form

The consent form was changed multiple times during the project due to change of personnel and a change of name of a department; this is the last version used.

### Interview Information Sheet & Consent Form

#### ***Change Management at the Hospital Unit Level: The Use of Systematic Adverse Event Information to Improve Patient Outcomes***

**Principal Investigator** Dr. Alan Forster (613-798-5555 x12777)  
**Sponsor:** Ontario Research Fund Research Excellence Program

#### **Purpose of the study**

The purpose of the study is to determine organizational factors facilitating and/or impeding the implementation of a systematic approach to detecting, analyzing, and responding to adverse events at the unit level at the Ottawa Hospital. Throughout the study, we will also determine the opinions of health care team members reflecting the causes of adverse events and the selection of patient safety priorities.

#### **Participation**

Your participation will involve being interviewed by a member of our research team. The interview will last approximately one hour, will be recorded for quality control purposes, and will be scheduled at a time that is most convenient for you. The interview will involve providing your views on adverse events in your unit at the Ottawa Hospital. You may skip any question you are not comfortable answering. You may also be contacted at a later date to participate in subsequent interviews. In that case, you will be required to sign a new consent form for each interview.

#### **Risks**

As a participant, you may discuss adverse events that have occurred in your department or in other areas of the hospital, which may cause you to feel upset.

#### **Benefits**

Your participation in this study will contribute to the advancement of knowledge on the facilitators and/or barriers to the implementation of a systematic approach to detecting, analyzing and responding to adverse events. Your participation will also provide insight regarding the causes of adverse events and the selection of patient safety priorities in your unit.

#### **Compensation**

No compensation will be provided for your participation in the study.

#### **Confidentiality**

The information collected during this study will be kept confidential and anonymous. Only research team members will have access to the interview transcripts, which will be assigned an independent study



number. Since it is common for research based on interviews to include quotations from participants, your name and position title will be disguised in any written reports. Quotations that would allow identification of the source will not be used in any research reports or publications. You will also be given the opportunity to review your interview transcripts. Reviewing the transcript will require you to provide the researcher with an email or mailing address. The link between your identity and independent study number will be stored securely and separately from all other study files. The audiotape will be deleted as soon as the interview transcription is finalized. The study data will be kept for 15 years after termination of the study. The Ottawa Health Science Network Research Ethics Board, the Ottawa Hospital Research Institute and the University of Ottawa Research Ethics Board may review relevant study records for audit purposes.

### **Voluntary Participation & Withdrawal**

Becoming a participant in this study is your choice. You are under no obligation to take part in this study and you may withdraw from this study at any time. Your choice not to participate will have no bearing on your current or future employment with the Ottawa Hospital. If you consent to participate and then decide to withdraw later on, any information gathered from you will not be used.

### **Questions about the Study**

If you have any questions about the study, now or at a later time, you may contact the study coordinator, Saskia Vanderloo at 613-798-5555 ext.18687 or via email at [svanderloo@ohri.ca](mailto:svanderloo@ohri.ca). If you have any questions regarding your rights as a subject, you may contact the Chairperson of the Ottawa Health Science Network Research Ethics Board at 613-798-5555, ext.16719.



## Interview Consent Form

### ***Change Management at the Hospital Unit Level: The Use of Systematic Adverse Event Information to Improve Patient Outcomes***

#### **Consent to Participate in Research**

I understand that I am being asked to participate in a research study regarding adverse event detection and management on my unit. This study has been explained to me by \_\_\_\_\_.

I have read this 3 page Information Sheet and Consent Form (or have had this document read to me). All my questions have been answered to my satisfaction. If I decide at a later stage in the study that I would like to withdraw my consent, I may do so at any time.

I voluntarily agree to participate in this study.

A copy of the signed Information Sheet and Consent Form will be provided to me.

#### **Signatures**

\_\_\_\_\_  
Participant's Name (Please Print)

\_\_\_\_\_  
Participant's Signature

\_\_\_\_\_  
Date

#### **Investigator Statement (or Person Explaining the Consent)**

I have carefully explained to the research participant the nature of the above research study. To the best of my knowledge, the research participant signing this consent form understands the nature, demands, risks and benefits involved in participating in this study. I acknowledge my responsibility for the care and well being of the above research participant, to respect the rights and wishes of the research participant, and to conduct the study according to applicable Good Clinical Practice guidelines and regulations.

\_\_\_\_\_  
Name of Investigator/Delegate (Please Print)

\_\_\_\_\_  
Signature of Investigator/Delegate

\_\_\_\_\_  
Date

## Appendix B

### Question guide for first case interviews in GIM

Could you please state your name, current position and how long you've been with the hospital?

- What is your educational background?
- Could you describe briefly your main responsibilities or your role?

We have some questions about PSLS

- Why is there a PSLS?
- How was PSLS introduced on your unit? (e.g. Training on the system)
- Have you reported incidents on PSLS?
- **If not** → what are the reasons? Have you witnessed adverse events? Do you have any concerns about reporting adverse events? If so, what are they?
- **If yes** → Roughly, how many incidents have you reported? What are the incidents that you report? Can you give us examples of...
- Have you reported on a peer? Why/ Why not?
- Do you report near misses? Why/why not?
- What happened after you reported the case?
- Did you track your case? What happens to the reports that are logged on the system?
- What was your experience with the system?
  - Subset of questions for managers/leaders
    - o What role do you have with respect to PSLS?
    - o How was PSLS introduced on your unit? (e.g. Training on the system)
    - o How is access to the system determined? (who grants access? who is allowed to see reports? Who is allowed to report?)
    - o What incidents should be reported on the system? Are these cases currently being reported on the system? Is there clarity on when to report? What about near misses, for example?
    - o What happens to the reports that are logged on the system? (Outcome of reporting, feedback loops, or lack thereof)
    - o Is PSLS helpful? Do you have confidence in the system?
    - o What do you think is the staff's view of PSLS?
  - Based on your experience what are the strengths of the system?
  - What are the weaknesses? (e.g. ease or difficulty of use; time pressures)
  - What are your recommendations for improving the PSLS?

We have some questions about patient safety in general

- What are the prevalent views of patient safety and of adverse events that dominate on the unit?
- Are people free to admit mistakes? Why/why not?
- Why would people decide to report or not report adverse events? ("too common occurrence" view; time pressures; intraprofessional concerns; interprofessional concerns; fear; other)
- How are patients kept safe?
  - (next two not asked as much)
    - o Are patient safety workarounds employed? Describe each.
    - o Are there common patient safety or adverse event stories that circulate in the unit?
  - How would you evaluate patient safety generally in your unit?
  - Do you have recommendations for improving patient safety in your unit?
  - How would you evaluate patient safety generally at TOH?
  - Do you have recommendations for improving patient safety at TOH?
  - What should I have asked you that the interview did not cover?

## Question guide for second case interviews – OBS/NEO

Could you please state your name, current position and how long you've been with the hospital?

- What is your educational background?
- Could you describe briefly your main responsibilities or your role?
- Do you have a responsibility for patient safety in your role? (explain)
  
- Are there times when patient safety was not ideally realized? (example)
  - Did you report this? Why/Why not?
  - With what frequency do you report?
  - Who reports?
  - Is it clear what to report? How?
  - What happens after you press submit? (who sees it, outcome of reporting)
- Why is there a PSLS?
- How was PSLS introduced on your unit? (e.g. Roll out, Training on the system)
- Can you define a near miss, and give an example?
- Are near misses worth reporting? Why/Why not?  
(not frequently asked based on the above)
  - Are people free to admit mistakes? Why/why not?
  - Why would people decide to report or not report adverse events? (“too common occurrence” view; time pressures; intraprofessional concerns; interprofessional concerns; fear; other)
- Based on your experience what are the strengths of the PSLS system?
- What are the weaknesses? (e.g. ease or difficulty of use; time pressures)
- What are your recommendations for improving the PSLS?
  
- Describe interdisciplinary teamwork. Does it work? What makes it work? Why?
  
- Do you know about More OB? Was it useful? Why/Why not?
- Are the values of MORE OB still here? How do you know?
  
- Do you engage in debriefing? When does it happen? Why?
- Do you value debriefing? Why/Why not?
  
- How would you evaluate patient safety generally in your unit?
- Do you have recommendations for improving patient safety in your unit?
- Many high risk industries (aviation, nuclear power) have been labelled as Proactive in their approach to safety. Healthcare has been labelled as more reactive in comparison. How would you situate your unit on this scale? Why?
- How would you evaluate patient safety generally at TOH?
- Do you have recommendations for improving patient safety at TOH?
- What should I have asked you that the interview did not cover?