ORGANIZATIONAL LEARNING FROM NEAR MISSES IN HEALTH CARE

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy
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Abstract

How clinicians detect and differentiate near misses from adverse events in health care is poorly understood. This study adopted a constructivist grounded theory approach and utilized document analysis and semi-structured interviews with 24 managers (middle and senior) and clinicians to examine the processes and factors associated with recognizing and recovering and learning from near misses in daily clinical practice. While safety science suggests that near misses are sources of learning to guide improvement efforts, the study identified how clinicians and managers cognitively downgrade and accept near misses as a routine part of daily practice. Such downgrading reduces the visibility of near misses and creates a paradoxical effect of promoting collective vigilance and increased safety while also encouraging violations in clinical practice. Three approaches to correcting and/or learning from near misses emerged: “doing a quick fix,” “going into the black hole,” and “closing off the swiss-cheese holes”; however, minimal organizational learning occurs. From these findings, two key paradoxes that undermine organization-level learning require further attention: (a) near misses are pervasive in everyday practice but many remain undetected and are missed learning opportunities, and (b) collective vigilance serves as both safety net and safety threat. Study findings suggest that organizational efforts are required to determine which near misses need to be reported. Organizations need to
shift the culture from one of “doing a quick fix” to one that learns from near misses in daily practice; they should reinforce the benefits and reduce the risks of collective vigilance, and further encourage learning at the clinical microsystem level. Future research is required to provide insight into how individual, social, and organizational factors influence the recognition, recovery, and instructional value of near misses and safety threats in health care organizations’ daily practice.
Acknowledgements

I would like to thank my thesis committee, Drs. Ross Baker, Lorelei Lingard, and Whitney Berta, for the sage and scholarly advice they provided over the course of my doctoral research. Ross, as my thesis supervisor and mentor and as a leading expert in patient safety and quality research, challenged me to look at safety through a more comprehensive and critical lens—and to look beyond what we already know about patient safety and system performance. Lorelei, with her theoretical and methodological expertise, challenged me to give credence to the meaning of what people say—and do not say. Whitney, with her extensive knowledge and research expertise in organization and management theory, challenged me to bring multiple levels into my analysis and recommended implications of the study findings.

I also would like to thank Drs. Anne Matlow and Ayelet Kuper who were my internal reviewers for the thesis proposal defence and final dissertation defence, respectively, and Dr. Pamela Mitchell who was my external reviewer, for their thoughtful critique that shaped the final analysis and presentation of the data, discussion, and implications for practice, education, and future research. I also thank Mark Poulin for his time and skill in copyediting my manuscript.

I am eternally grateful for being able to access 24 caring and conscientious clinicians and administrators who strive for quality and safety in their daily practice and who took the time to share their thoughts, perspectives, and stories while being interviewed for this study. Although many of the interviews were conducted well over a year ago before writing this acknowledgement, I recall many of their responses without having to look at the transcript!

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As I reflect back on my PhD experience, I am overwhelmed with the encouragement and inspiration that my family and friends have given me: My Granny Smith who encountered several safety issues in her dying days of life and my mother, Muriel Jeffs, who experienced two significant adverse events while she was recovering from a neurosurgical procedure to prevent an aneurysm from rupturing; both compelled me to work towards making health care safer. Seven years ago, Deborah Tregunno encouraged me to connect with Ross to begin my PhD and she is always just a phone call away for a consultation. Madelyn Law and San Ng—whom I was fortunate to meet in the PhD program and with whom I quickly formed a PhD support group. Heather Campbell and Jane Merkley, for our “poolside conversations” that involved teasing out some of the complex practice issues that emerged in my PhD work. My family members, Aidan and Noah Schonewille and Julia Cass, who hung out with me on the weekend nights, who watched TV with me, or entertained me by playing Guitar Hero—and reminded me how precious it is to be curious and open to learning new things. My sister, Tracey Jeffs, who has expertise in quality and safety in the mining industry, offered her perspective on my thesis and took care of her little sister. To my father—there is now another DR Jeffs in the family! And last—but not least—to my best friend, mentor, and life partner Dan Cass, for your patience, love, support, and incredible sense of humour to see me through my PhD.
# Table of Contents

Abstract.......................................................................................................................... ii
Acknowledgements.......................................................................................................... iv
List of Tables .................................................................................................................... ix
List of Figures .................................................................................................................. x
List of Appendices............................................................................................................. xi

CHAPTER 1: INTRODUCTION ................................................................................... 1
  1.1 Background................................................................................................................ 1
  1.2 Reporting and Learning From Patient Safety Events: Global and National
      Efforts .......................................................................................................................... 2
  1.3 Empirical and Descriptive Literature .................................................................. 4
      1.3.1 Defining Near Misses in Health Care ......................................................... 4
      1.3.2 Detecting Near Misses and Differentiating From Adverse Events ...... 6
      1.3.3 Learning From Near Misses and Other Patient Safety Events ............. 7
  1.4 Problem Statement and Research Questions ....................................................... 10

CHAPTER 2: THEORETICAL PERSPECTIVES ..................................................... 13
  2.1 Introduction ............................................................................................................. 13
  2.2 Safety Science ........................................................................................................ 15
      2.2.1 Near Misses as Recovered Initial Failures .............................................. 15
          2.2.1.1 Eindhoven Model of Incident Causation ....................................... 16
          2.2.1.2 Recovery Process Model ................................................................. 17
      2.2.2 Near Misses as Precursors to Adverse Events ....................................... 19
          2.2.2.1 The Safety Pyramid Model ......................................................... 19
          2.2.2.2 Accident Causation Model ............................................................. 21
          2.2.2.3 Safety System Migration Models .................................................. 24
  2.3 Organization Theory .............................................................................................. 26
      2.3.1 Model of First- and Second-Order Problem Solving ......................... 26
      2.3.2 Social Perspective on Learning ................................................................. 29
  2.4. Summary of the Theoretical Perspectives ......................................................... 31

CHAPTER 3: METHODS ............................................................................................ 33
  3.1 Grounded Theory ................................................................................................. 33
  3.2 Methodological Implications and Research Orientation for Current Study .... 35
  3.3 Setting and Sampling Strategy ............................................................................. 37
3.4 Application of Constructivist Grounded Theory in Current Study .......... 39
  3.4.1 Document Analysis .................................................. 40
  3.4.2 Phase II Semi-Structured Interviews .......................... 42
  3.5 Ethical Considerations .................................................. 44

CHAPTER 4: VISIBILITY AND IMPORTANCE OF NEAR MISSES IN
EVERYDAY CLINICAL PRACTICE ........................................ 46
  4.1 Introduction .......................................................... 46
  4.2 What We Know About Near Misses .................................. 47
  4.3 Methods ............................................................ 50
  4.4 Results ............................................................. 51
  4.5 Discussion .......................................................... 56
  4.6 Limitations .......................................................... 58
  4.7 Implications ........................................................ 58

CHAPTER 5: NEAR MISSES AT THE EDGES OF THE SAFETY MARGINS:
VIGILANCE AND VIOLATIONS IN CLINICAL PRACTICE .......... 60
  5.1 Introduction .......................................................... 60
  5.2 Current Perspectives on Near Misses ................................. 61
  5.3 Method ............................................................. 64
  5.4 Results ............................................................. 65
  5.5 Discussion .......................................................... 69
  5.6 Limitations .......................................................... 72
  5.7 Conclusion ........................................................ 72

CHAPTER 6: LEARNING FROM NEAR MISSES BEYOND A QUICK FIX:
EASIER SAID THAN DONE ............................................... 74
  6.1 Introduction .......................................................... 74
  6.2 What We Know About Organizational Learning and Safety .......... 76
  6.3 Method ............................................................. 78
  6.4 Sample Description .................................................. 78
  6.5 Results ............................................................. 79
    6.5.1 Doing a Quick Fix ............................................ 79
    6.5.2 Going Into the Black Hole .................................. 80
    6.5.3 Closing off the Swiss-Cheese Holes .......................... 80
    6.5.4 Triggers for Approaches .................................... 81
  6.6 Discussion .......................................................... 84
  6.7 Limitations ........................................................ 88
  6.8 Implications and Conclusion ...................................... 88
CHAPTER 7: IMPLICATIONS ........................................................................ 91
7.1 Introduction .......................................................................................... 91
7.2 Inconsistent Attention to Near Misses Leads to Learning Opportunity
    Losses .................................................................................................... 93
7.3 Vigilance and Violations Trade-Off Tension ........................................... 96
7.4 Implications for Organizational and Clinical Practice ......................... 97
    7.4.1 Sense Making and Learning at the Organizational Level ............. 98
    7.4.2 Collective Vigilance and Learning at the Clinical Microsystem Level .. 101
7.5 Future Research .................................................................................... 103
7.6 Limitations ........................................................................................... 104
7.7 Summary ............................................................................................... 105

References.................................................................................................... 107
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Definitions of Adverse Event, Sentinel Event, and Near Miss</td>
<td>3</td>
</tr>
<tr>
<td>2: Characteristics of Near Misses</td>
<td>5</td>
</tr>
<tr>
<td>3: Definitions of Failures</td>
<td>22</td>
</tr>
<tr>
<td>4: Properties of Near Misses</td>
<td>52</td>
</tr>
<tr>
<td>5: Types of Deviations in System Mitigation Models</td>
<td>63</td>
</tr>
</tbody>
</table>
### List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Eindhoven Model of Incident Causation</td>
<td>17</td>
</tr>
<tr>
<td>2: Recovery Process Model</td>
<td>18</td>
</tr>
<tr>
<td>3: Reason’s Accident Causation Model</td>
<td>23</td>
</tr>
<tr>
<td>4: System Migration Model</td>
<td>25</td>
</tr>
<tr>
<td>5: Action Approaches and Triggers</td>
<td>82</td>
</tr>
</tbody>
</table>
# List of Appendices

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Overview of Patient Safety in Other Countries</td>
<td>122</td>
</tr>
<tr>
<td>B: Reporting and Learning From Patient Safety Events: Canadian Efforts</td>
<td>130</td>
</tr>
<tr>
<td>C: Survey of Near-Miss Definitions</td>
<td>137</td>
</tr>
<tr>
<td>D: Sampling Strategy</td>
<td>139</td>
</tr>
<tr>
<td>E: Document Analysis</td>
<td>145</td>
</tr>
<tr>
<td>F: Interview Guide</td>
<td>153</td>
</tr>
<tr>
<td>G: Interview Informed Consent</td>
<td>154</td>
</tr>
<tr>
<td>H: Video/Audio Taping Consent Form</td>
<td>159</td>
</tr>
<tr>
<td>I: Dimensions of Vigilance</td>
<td>165</td>
</tr>
<tr>
<td>J: Triggers Influencing Action Pathways</td>
<td>167</td>
</tr>
</tbody>
</table>
CHAPTER 1: INTRODUCTION

1.1 Background

There is no doubt that with advances in health care there will always be new ways in which things will go wrong, but with the appropriate integrated systems and mechanisms for disseminating information, a near miss in one part of the world should be able to be prevented from turning into a dreadful event in any other part of the world. (Runciman et al., 2006)

Leading scholars call for clinicians, health care organizations, and policy makers to use near misses\(^1\) as sources of learning that highlight system vulnerabilities and point to opportunities for quality improvement in health care (Carroll & Edmondson, 2002; Reason, 1997). Near misses present valuable learning opportunities as they are no-harm events that researchers estimate occur between 3 to 300 times more often than adverse events (Aspden, Corrigan, Wolcott, & Erickson, 2004; Barach & Small, 2000). In safety science, near misses are viewed as precursors to accidents and as occurrences that can shed light on preventative strategies aimed at system performance (Bird & Germain, 1996; Heinrich, 1931; Hyden, 1987). Suggested quality improvement initiatives in health care include the development of safety reporting systems that include near misses to promote interorganizational learning and preventive action (Kohn, Corrigan, & Donaldson, 1999).

This view reflects the opportunity in near miss reporting to effect changes in the attitude and behaviour of the reporter, leading to better performance (Aspden et al., 2004; Barach & Small, 2000; Kaplan & Rabin Fastman, 2003; Reason, 1997). In these cases, reporters learn to trust the reporting system to communicate about and improve patient safety without risk of disciplinary or legal action (Aspden et al., 2004).

Although there is limited information on the occurrence of near misses in health care, evidence in the safety management literature suggests that near miss occurrences can inform the

\(^1\) Near misses are defined as occurrences that could have harmed the patient, but did not cause harm as a result of chance, prevention, or mitigation (Aspden et al., 2004).
design and delivery of safer systems and environments (Aspden et al., 2004; Barach & Small, 2000). Consequently, this study sought to explore what health care organizations are learning from near misses and how learning takes place. This introductory chapter first provides background information on reporting and learning from patient safety events as a global and national priority. Second, the chapter presents overviews of key empirical findings that draw from the health care system and other safety critical industries associated with near misses, errors, and adverse events. Third, a synthesis of what is known and unknown is combined with the focus for this current study and reflected in a problem statement that guides the research objectives and questions.

1.2 Reporting and Learning From Patient Safety Events: Global and National Efforts

Since 1991, reporting and learning from patient safety events has received global attention. Adverse event studies undertaken in the United States, Australia, the United Kingdom, New Zealand, France, Holland, and Spain illustrate the extent to which patient safety is a global and national health policy priority. These studies report that approximately 3% to 17% of hospital admissions result in some form of harm to patients. Of these cases, 37% to 51% are estimated to be preventable (Aranaz, Albar, Vitaller, & Ruiz, 2005; Baker et al., 2004; Brennan et al., 1991; Davis et al., 2003; Leape et al., 1991; Thomas et al., 2000; Vincent, Neale, & Woloshynowycz, 2001; Wilson et al., 1995). It is important to note that these studies do not take into account near miss events.

Along with the aforementioned studies, a growing number of specific global and national legislative changes and initiatives seek to enhance reporting and learning from patient safety events (see Appendixes A & B). However, near misses receive much less attention. For example, near misses are not included as reportable events in federal or provincial legislation in Canada, and they
only recently have been addressed in national accreditation standards for health care organizations. Specifically, Accreditation Canada\(^2\) developed standards that promote reporting and learning from patient safety events that include adverse events, sentinel events, and near misses (see Table 1 for a definition of each event). In addition, 4 of the 31 Required Organizational Practices (ROPs)\(^3\) focus on reporting and/or making improvements on what is learned from patient safety events, including near misses. (Appendix B provides more details of the associated ROPs.) According to Accreditation Canada (2008), near misses provide a “free lesson” in proactive risk management and error prevention.

Table 1

*Definitions of Adverse Event, Sentinel Event, and Near Miss*

<table>
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<tr>
<th>Patient safety event</th>
<th>Definition</th>
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<tr>
<td>Adverse event</td>
<td>Usually negative or unfavourable reactions or results that are unintended, unexpected, or unplanned.</td>
</tr>
<tr>
<td>Sentinel event</td>
<td>An unexpected incident, related to system or process deficiencies, which leads to death or major and enduring loss of function(^a) for a recipient of health care services.</td>
</tr>
<tr>
<td>Near miss</td>
<td>An event or circumstance which has the potential to cause serious physical or psychological injury, unexpected death, or significant property damage, but did not actualize due to chance, corrective action, and/or timely intervention.</td>
</tr>
</tbody>
</table>

\(^a\)Major and enduring loss of function refers to sensory, motor, physiological, or psychological impairment not present at the time services were sought or began. The impairment lasts for a minimum period of 2 weeks and is not related to an underlying condition.

Source: Accreditation Canada Reference Guide on Near Misses.

\(^2\) Accreditation Canada was formerly known as the Canadian Council on Health Services Accreditation.

\(^3\) Accreditation Canada (2008) defines a ROP as “an essential practice that … organizations must have in place to enhance patient/client safety and minimize risk” (¶ 1).
1.3 Empirical and Descriptive Literature

In addition to the global and national efforts to enhance reporting and learning from patient safety events cited above, other empirical studies and descriptive articles provide information on near misses in health care. This section presents an overview of research relevant to organizational learning from near misses and is categorized as (a) defining, (b) detecting, and (c) learning from near misses. These three subsections represent how near misses have primarily been described in the literature. Theoretical perspectives are further delineated in chapter 2.

1.3.1 Defining Near Misses in Health Care

Several classification schemas have been developed for adverse events or errors (Chang, Schyve, Croteau, O’Leary, & Loeb, 2005; Morimoto, Gandhi, Seger, Heish, & Bates, 2004; Runciman et al., 2006; Thomas, Mackway-Jones, & Boreham, 2004; World Health Organization, 2006). Less attention has been paid to classifying near misses in health care. Currently there is a lack of clarity and consensus regarding what constitutes a near miss occurrence in health care, which results in varied definitions of near misses throughout the literature.

Numerous studies define near misses as occurrences that could have harmed the patient but did not cause harm as a result of chance, prevention, or mitigation (Aspden et al., 2004; Battles & Lilford, 2003; Henneman & Gawlinski, 2004; Kaplan & Rabin Fastman, 2003). Ginsburg et al. (2009) extend our understanding of near misses by differentiating between minor and major near misses: Minor near misses are defined as events that would have resulted in no harm or minimal temporary harm to the patient if not for timely intervention or because of good luck; major near misses refer to events that would have resulted in death or serious physical or psychological injury if not for the same reasons. Near misses are also conceptualized as recovery processes (Jeffs, MacMillan, & Maione, 2009; Kanse, van der Schaaf, Vrijland, & van Mierlo,
2006); proactive practices (Mick, Wood, & Massey, 2007); paradoxes in everyday clinical practice (Jeffs, Affonso, & MacMillan, 2008); and as a complex phenomenon (Ginsburg et al., 2009). In clinical venues, near misses are also referred to as close calls (Canadian Patient Safety Institute, 2008; Coyle, 2005); good catches (Barnard, 2006; Coyle, 2005); or near hits (Tamuz, Thomas, & Franchois, 2004). Reconciling the different definitions is key to achieving conceptual clarity and guiding future inquiry. The current lack of clarity on specific events that comprise and are defined as near misses limits clinicians’ ability to recognize and subsequently learn from near misses (Henneman, Blank, Gawlinski, & Henneman, 2006). Table 2 presents an overview of how near misses are defined in the literature. (Chapters 2 and 4 discuss how near misses are identified and described; see also Appendix C: Survey of Near-Miss Definitions.)

Table 2

*Characteristics of Near Misses*

<table>
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<tr>
<td>An act of commission or omission that could have harmed the patient, but did not cause harm as a result of chance, prevention, or mitigation.</td>
<td>Aspden et al., 2004&lt;br&gt;Ginsburg et al., 2009</td>
</tr>
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<td>A non-event, good catch, great catch, or accident waiting to happen that was prevented from completion through a planned or unplanned recovery.</td>
<td>Battles &amp; Lilford, 2003&lt;br&gt;Henneman &amp; Gawlinski, 2004&lt;br&gt;Kaplan &amp; Rabin Fastman, 2003&lt;br&gt;Tamuz et al., 2004</td>
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<tr>
<td>An event that could have had adverse consequences but did not and was indistinguishable from full-fledged adverse events in all but the outcome.</td>
<td>Barach &amp; Small, 2000</td>
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<tr>
<td>A potential adverse event where through an act of omission or commission may have had the potential for harm but, through luck or a robust physiology, had no ill effect on the patient.</td>
<td>Battles &amp; Lilford, 2003&lt;br&gt;Kaplan &amp; Rabin Fastman, 2003</td>
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1.3.2 Detecting Near Misses and Differentiating From Adverse Events

In recent years, research efforts have sought to gain insight into how frontline clinicians differentiate near misses from adverse events (Ferranti et al., 2008; Ginsburg et al., 2009; Henneman & Gawlinski, 2004). To date, the majority of studies related to patient safety have focused on post-event detection methods. These include: voluntary reporting systems (Taylor, Brownstein, Klein, & Strandjord, 2007); trigger tools (Forster et al., 2006); chart reviews (Rozich, Haraden, & Resar, 2003; Sharek et al., 2006); and automated event detection (Bates, Boyle, Vander Vliet, Schneider, & Leape, 2003; Jacobs et al., 2007). With the exception of Ginsburg et al.’s (2009) study that conducted focus groups with administrators (patient safety officers, and pharmacy and patient care managers) and with frontline nurses and allied health care professionals, most studies were conducted in specific clinical areas that include emergency room settings (Henneman et al., 2006; Hohenhaus, 2008; Richardson, 2006); a pediatric intensive care unit (Grant & Larsen, 2007); general medicine (Chaudhry, Olofinboba, & Krumholz, 2003); and neonatal intensive care (Simpson, Lynch, & Grant, 2004).

In terms of health care disciplines, studies on near misses have involved nurses (Chaudhry et al., 2003; Henneman et al., 2006; Hohenhaus, 2008; Richardson, 2006); pharmacists (Chaudhry et al., 2003; Simpson et al., 2004; Tamuz et al., 2004); physicians (Chaudhry et al., 2003; Tamuz et al., 2004); and lab technologists (Chaudhry et al., 2003). In Henneman et al.’s (2006) study, nurses (n=29) report the following key strategies used to detect errors in the emergency department: surveillance, anticipation, double-checking, awareness of the big picture, and experiential knowing. Although health care organizations have sought to conceptualize a near miss model (Affonso & Jeffs, 2004; Henneman & Gawlinski, 2004; Jeffs et al., 2008; Jeffs et al., 2009), no empirical work has explored how health care professionals
identify and detect near miss occurrences in their daily practice. Understanding how clinicians interact with each other and with patients will help elucidate how they recognize near miss occurrences and may inform future organizational strategies aimed at improving performance by enhancing clinicians’ ability to detect and correct near misses; consequently, this is further explored in chapters 2, 4, and 5.

1.3.3 Learning From Near Misses and Other Patient Safety Events

The body of work related to reporting safety events also informed this study, as reporting behaviours are a key to learning from safety events. The literature identifies the primary purposes of reporting as: (a) tracking progress in the prevention of errors and (b) serving as key learning and improvement opportunities (Chaudhry et al., 2003; Leape, 2002). Despite the espoused value of incidents as learning opportunities, the underreporting of adverse events (Kopp, Erstad, Allen, Theodorou, & Priestley, 2006; Wald & Shojania, 2001)—and even more so near misses—is believed to be pervasive (Evans et al., 2006; Hohenhaus, 2008; Lawton & Parker, 2002; Leape, 2002; Wachter & Shojania, 2004). To date, most empirical work related to reporting safety incidents has focused mainly on adverse events (Kagan & Barnoy, 2008; Kopp et al, 2006; Wald & Shojania, 2001) or constitutes studies that also address near misses (Chaudhry et al., 2003; Evans et al., 2006; Ginsburg et al., 2009; Hohenhaus, 2008; Milch et al., 2006; Richardson, 2006; Uribe, Schweikhart, Pathak, Dow, & Marsh, 2002). This collective work has revealed that the underreporting of errors and near misses is influenced by a complex interplay amongst diverse individual and organizational factors.

Attention to the interplay between individuals and organizations is important in a health care system that is viewed as a collection of interdependent processes with multiple checkpoints and interfaces carried out by distinct groups (Edmondson, 1996). Further, effective learning
related to near misses and adverse events in health care is a social process that involves interactions amongst providers, administrators, patients, and caregivers who have varying roles and decision-making responsibilities. According to Amalberti, Auroy, Berwick, and Barach (2005), variation exists between different stakeholders regarding patient safety accountabilities. Specifically, senior leadership is concerned with high-visibility (e.g., sentinel) events and other measures valued by the public; middle managers, service chiefs, and department chairs focus on the product-line quality perspective on safety; and individual clinicians are attentive to issues in their daily work (Amalberti, Vincent, Auroy, & de Saint Maurice, 2006). Variations in stakeholder perspectives in error reporting have been documented, including differences in physicians’ and nurses’ perception of errors (Espin, Levinson, Regehr, Baker, & Lingard, 2006; Espin, Lingard, Baker, & Regehr, 2006); reporting channels and the perception of safety as a priority (Pronovost et al., 2003); and team communication (Lingard, Reznick, DeVito, & Espin, 2002; Lingard, Reznick, Espin, Regehr, & DeVito, 2002; Lingard et al., 2005). Edmondson (1996, 2004) reports significant differences in speaking up on sensitive topics like medical error, while Tregunno, Baker, Barnsley, and Murray (2004) discuss different perspectives on safety and quality improvement issues between senior management and frontline health care providers in the emergency department setting. Given these dissonant perspectives, an understanding of how safety is viewed from multiple viewpoints is paramount.

Of the above-mentioned stakeholders, nurses are the most likely health care professionals to report near misses. In Milch et al.’s (2006) study, nurses generated 50% of the reports, compared to physicians who accounted for fewer than 2% on a Web-based system. Physicians’ reluctance to report near misses and adverse events is well documented (Chaudhry et al., 2003; Leape, 2002). Evidence also reveals that it is easier to report another colleague (compared to
oneself) in an intra-versus interdisciplinary setting (Elder, Brungs, Nagy, Kudel, & Render, 2008; Espin, Lingard, et al., 2006). In another study, nurses indicated they engaged in more informal methods of reporting, such as collegial discussions in the coffee room or recording information in their nursing notes (Espin, Levinson, et al., 2006). While all of these studies focus on the frontline health care professional, there is a dearth of research that examines the factors and processes that influence and are associated with reporting of near misses in health care.

Attention to the social context of reporting and learning—that is, the health care organizations where health care professionals practice—is noticeably absent from the literature (Hoff & Sutcliffe, 2006). Recently, a leading patient safety scholar suggested this lack of attention may explain the slow progress and variable impact on interventions aimed at improving patient safety (Vincent, 2009). Little is known about how disparate interactions result (or fail to result) in organizational learning (Beck & Plowman, 2009; Dekker, 2007). Because safe care requires interactions amongst clinicians and patients, consideration of the social interactions and dynamics could advance our understanding of how organizations interpret and learn from near misses. Chapter 2 provides a more detailed description of the social nature of learning in organizations and its potential application to near misses in health care. Findings that correspond to learning from near misses are further explored in chapter 6.

A dearth of literature examines organizations’ post-event actions based on reported patient safety occurrences (Pisano, Bohmer, & Edmondson, 2001; Tucker & Edmondson, 2003). Research on learning from patient safety events is largely limited to failures and adverse events (Chuang, Ginsburg, & Berta, 2007) or focuses on the reporting of near misses (Chaudhry et al., 2003; Evans et al., 2006; Hohenhaus, 2008; Milch et al., 2006; Richardson, 2006; Uribe et al., 2002). Recently, Ginsburg et al. (2009) explored how clinicians and managers are learning from near misses and
other patient safety events; most notably, the researchers conclude that although near misses are valuable for learning from a theoretical standpoint, clinicians tend to learn more from catastrophic events. Another gap in practitioners’ knowledge involves the identification of organizational factors that influence or impede learning from near misses. Prior work suggests that conditions that increase the occurrence of errors may differ from those that foster clinicians’ ability to catch, correct, and learn from errors (Edmondson, 1996). However, this has not been explored empirically.

Further investigation of factors affecting health care organizations’ ability to learn from near misses is required. Such knowledge may inform organizations on strategies to enhance reporting and learning from near miss events in the health care system. Theoretical underpinnings of organizational learning and responses to near misses and failures are described in chapter 2 and contrasted with study findings in chapter 6.

1.4 Problem Statement and Research Questions

At the outset of this study in 2004, critics called for near misses to become integral parts of quality and risk management reporting systems (Aspden et al., 2004). Some scholars point to near misses as recovery processes and precursors to adverse events that occur more frequently than the latter events and result in no harm, thus providing valuable learning opportunities to improve health care. As research has only begun to describe how to learn from near misses in order to improve patient safety, there remains a lack of conceptual clarity on near misses and on whether definitions derived from safety science literature apply to clinical practice. Moreover, how clinicians detect and differentiate near misses from adverse events is poorly understood and empirically limited. From a theoretical standpoint, the linear models (Kanse et al., 2006; van der Schaaf, 1992) suggest that detection of near misses is a key step to recovering from initial failures, yet no explanation is offered on how individuals detect initial failures and determine
whether or not they are near misses. A further limitation is safety-science models’ inadequate consideration of the social aspects of detecting, responding to, and learning from near misses. This is relevant to the current study, as the delivery of health care in organizations occurs at the clinical microsystem level where patients, practitioners, and patterns of practice interact to determine safety-care processes (Espin, Lingard, et al., 2006). Organizational theory promises to address the lack of attention to social aspects of learning from near misses (see chapter 2), though to date work on organizational learning has not considered near misses. Addressing the current knowledge gaps may yield greater insight into how clinicians detect, respond to, and learn from near misses during interactions with other clinicians and patients in the health care environment.

In summary, this study is predicated on what is known about the way organizations learn from near misses and attempts to explore what remains unknown. In this context, the primary objective of this research study is to gain understanding of what processes and factors are associated with how near misses are recognized, recovered, and learned from in daily clinical practice in a health care setting. Specific questions that evolved over the inquiry include: To what extent and under what circumstances do practitioners recognize and react to near misses? What are the elements of the social context and interpersonal dynamics that contribute to the recognition of near misses? What are the mechanisms by which near misses become visible in clinical practice? What are the learning processes associated with near misses? Does an organization’s view of near misses influence learning or not? What factors influence or inhibit learning from near misses in health care? In this context, my goal was to develop an in-depth understanding of how hospitals use various internal and external sources to learn from near misses.

This study explores the above questions by drawing from empirical and theoretical perspectives of patient-safety and organizational-theory literature (chapter 1 discussed the
existing empirical evidence; chapter 2 presents the theoretical perspectives). Chapter 3 provides an overview of the methodology used for this study. Through an iterative process of constant comparative analysis, theoretical explanations emerge as to how organizations experience and learn from near misses. The research questions explored in this study seek to determine: (a) how health care organizations experience learning from near miss occurrences—particularly how organizational learning impacts near misses and how near miss occurrences impact organizational learning—and (b) the factors and conditions that support and/or constrain organizational learning from near misses. Chapter 4 examines how clinicians and administrators define and detect near misses in clinical practice. A key part of chapter 4 is the delineation of the processes and mechanisms that influence how near misses are made visible and deemed consequential in everyday practice. Study findings draw attention to how individual clinicians cognitively process and interact with others in their daily practice to determine if an event is a near miss and perceived as having consequences.

Chapter 5 explores how the routine nature of near misses in daily practice involves the interplay of collective vigilance in managing violations. Study findings reveal that compromises between enacting collective vigilance and managing violations produce an unintended consequence of decreasing performance. Chapter 6 focuses on the nature and contributing factors of learning and, more accurately, of not learning from near misses. Chapter 6 delineates three approaches—“doing a quick fix,” “going into the black hole,” and “closing off the swiss-cheese holes”—and their underlying triggers. Finally, chapter 7 presents recommendations for how the study findings can inform strategies aimed at the organizational and clinical microsystem levels and future research.
CHAPTER 2: THEORETICAL PERSPECTIVES

2.1 Introduction

Our understanding of how organizations learn from near misses draws from several theoretical perspectives derived from: (a) the safety sciences literature, and (b) organizational theory. Of particular relevance for this study are the linear safety models that describe near misses as recovered initial failures (Kanse et al., 2006; van der Schaaf, 1992) and as precursors to adverse events (Bird & Germain, 1996; Heinrich, 1931; Hyden, 1987; Perrow, 1984; Phimister, Oktem, Kleindorfer, & Kunreuther, 2003; Reason, 1997). Interestingly, the linear models describe the detection of near misses as a key step to recovering from initial failures, yet no work has explained how individuals detect initial failures and determine whether they are near misses or not. Further exploration to unravel the processes associated with detecting and differentiating near misses is required in order to inform future practice and policy strategies aimed at enhancing safety and performance in organizations.

In system migration models, near misses are described as events at the edge of the safety margins (Amalberti et al, 2006; Cook & Rasmussen, 2005). Both the system migration and the linear safety models explain why near misses occur at the human operator level; however, neither model reveals how the interactions of people in organizations influence the manner in which near misses are detected, responded to, and learned from. This is a shortcoming in the safety literature, as the delivery of health care in organizations relies upon social processes that occur at the clinical microsystem level where patients, practitioners, and patterns of practice interact (Espin, Lingard, et al., 2006).

The primary objective of this research study is to provide a theoretical explanation of how health care organizations experience and learn from near misses. Thus, in addition to the
information derived from the field of safety science, this study makes use of organizational theory—or more precisely, organizational learning theory—to shed light on how organizations learn. Of particular importance is the Model of First- and Second-Order Problem Solving (Tucker & Edmondson, 2003) that builds on the single- and double-loop model of learning (Argyris, 1994; Argyris & Schön, 1978) and offers an explanation of the types of learning that occur when problems or failures are detected in health care. This explanation is described in further detail later in the chapter.

A growing number of authors conceptualize learning as a social phenomenon whereby individuals construct meaning through their interactions with others in their daily work environments (Antonacopoulou & Chiva, 2007; Baum & Dahlin, 2007; Easterby-Smith, Crossan, & Nicolini, 2000; Iedema, 2009; Nutley & Davies, 2001). This conceptualization may address the limited focus of previous research on the human-operator level identified earlier. Although there is a call for more attention to learning as a social process, empirical work is scarce and limited to framework development and reviews (Tucker, Nemhard, & Edmondson, 2007); organizational factors that influence or impede learning from near misses have yet to be identified. Prior work suggests that different factors may contribute to (a) the likelihood of errors and (b) clinicians’ ability to catch, correct, and learn from errors (Edmondson, 1996); however, this has not been explored empirically with near misses. Further investigation into what contributes to learning from near misses may in turn help identify corrective actions that would best address the systemic, underlying causes of such occurrences.

In summary, the two bodies of literature point to the merits of examining individual-, social-, and organizational-level explanations of how health care organizations learn (or not) from near misses—an integration of theoretical perspectives that offers a more comprehensive
understanding of near-miss learning than that offered by single-theory explanations. This integrated approach broadens our understanding of what is known and/or unknown about the processes associated with learning from near misses in health care organizations. Moreover, this wider lens forms the theoretical landscape for understanding the emergent themes and categories from the study’s data set. The remainder of the chapter is organized under safety science and organizational theory sections that discuss organizational learning and the social view of organizations.

2.2 Safety Science

The field of safety science has evolved from a focus on the individual to a more system-wide view that includes attention to organizational factors that influence safety. This field draws from work done in the following industries: nuclear power, chemical processing, and transportation (aviation and railway). Within safety science, near misses are conceptualized mainly as a linear process whereby an initial failure is recovered and an error is averted. Similarly, system migration models describe near misses as events at the edges of safety margins that do not cross the unacceptable-performance boundary. These models extend our understanding of how near misses involve individual human operators and provide a description of organizational factors that contribute to or result in near misses. The following section provides a description of relevant models within safety science.

2.2.1 Near Misses as Recovered Initial Failures

Within the linear models of safety science, near misses are conceptualized as recovery processes experienced at the human-operator level. This conceptualization adds to our understanding of the differentiation between near misses and adverse events. The differentiation threshold is the presence or absence of recovery processes that result in no harm (i.e., a near
miss) and harm (i.e., an adverse event), respectively (Aspden et al., 2004; Barach & Small, 2000; van der Schaaf, 1992). This concept draws from two models: the Eindhoven Model of Incident Causation (van der Schaaf, 1992) and the Recovery Process Model (Kanse et al., 2006). Both models describe participation in the recovery process as being contingent upon the cognitive processes and actions of the human operator at the individual level focus.

2.2.1.1 Eindhoven Model of Incident Causation

The Eindhoven Model of Incident Causation (see Figure 1) derived from the chemical processing industry includes four sequential phases: (a) initial failure (classified as technical, human, and organizational); (b) dangerous situation; (c) inadequate defenses; and (d) recovery (van der Schaaf, 1992). An informal set of barriers is activated in the last phase of recovery, which enables the human operator to detect, understand, and correct the developing risky situation in a timely manner. The recovery is usually predicated on the human operator’s flexibility, experience, and intuition; that is, his/her ability to recover from an undesired chain of events and to restore the original situation or to at least prevent major harm, thus converting the initial failure to a near miss (van der Schaaf, 1992). Within this model, a near miss is defined as an occurrence with potentially significant safety-related consequences that were prevented from developing. Henneman and Gawlinski (2004) and Henneman et al. (2006) examine the model in terms of its applicability to the health care sector and report on its limited use in the emergency department setting; however, further analytical work is required to determine if the model is an appropriate framing tool that may explain how near misses are experienced in the broader health care system.
2.2.1.2 Recovery Process Model

The recovery process outlined in the Eindhoven Model of Incident Causation was further developed in the Recovery Process Model (Kanse et al., 2006). This model includes the original failure factors and extends the activation of defenses to a recovery process that has three main phases: (a) detecting the failure or resulting deviation or problem; (b) identifying the scope and causes of the problem; and (c) enacting countermeasures to reconcile the problem and return back to normal state prior to consequences or harm occurring. (See Figure 2: Recovery Process Model.) Kanse et al. (2006) further explicate the types and nature of different recovery processes associated with near misses and errors. Recovery can be either planned or unplanned. Planned recovery occurs when the operator activates barriers and defenses to avoid negative outcome. Examples of planned recovery activities include adherence to existing automatic safety controls or procedures that may include written protocols or generally followed work practices.
Unplanned recovery occurs when the operator engages in ad hoc creative problem solving. Unplanned recovery activities are not part of standard practice and involve more improvisation on the part of the operator.

![Diagram of Recovery Process Model](image)

*Figure 2. Recovery process model. (Kanse et al., 2006)*

Using the Recovery Process Model to guide their inquiry, Kanse et al. (2006) conducted a field study in a pharmacy setting. A key finding from this study was that most of the recoveries of medication errors took the form of detection followed by countermeasures. Kanse et al. also discovered that organizational procedures, training, and clinicians’ knowledge and experience are integral components of error recovery. Though not explicitly using the Recovery Process Model, other studies lend support to the model. Rogers, Dean, Hwang, and Scott (2008), for instance, reveal that 350 of 502 registered nurses reported catching their own errors, while 43 reported intercepting a colleague in the process of an error. In Henneman et al.’s (2006) study exploring error recovery, nurses (n=29) reported using surveillance, anticipation, double-checking, awareness of the big picture, and experiential knowing to identify errors in the
emergency-department setting; each of these actions are examples of countermeasures in the
Recovery Process Model.

The conceptualization of near misses as recovery processes in the pharmacy setting and
in other industries (nuclear, aviation, chemical processing, and railway) holds promise for further
application in health care. For example, the Recovery Process Model used in health care may
involve the following scenario: A nurse identifies that a medication dose is incorrect (detection)
during a double check. The nurse then calls the pharmacy to clarify the order (explanation) and
subsequently receives and administers the correct medication (countermeasures). Hence, a
negative outcome was averted (wrong medication) due to the activation of countermeasures. This
example represents a near miss involving a planned recovery, as both the nurse and the
pharmacist followed organizational and regulatory standards of practice policies associated with
administering medication.

2.2.2 Near Misses as Precursors to Adverse Events

In safety science, near misses are suggested to be precursors to adverse events that
highlight vulnerabilities and inform the design of safety systems and environments. This
interpretation stems from conceptualizing near misses as part of the same causal continuum (i.e.,
chain of events) as errors. Within this continuum, similar failure-causing patterns precede
accidents and near misses alike. The safety science view of near misses as precursors to adverse
events and vulnerabilities at the systems level is derived from the safety-pyramid, accident-
causation, and safety-system-migration models discussed below.

2.2.2.1 The Safety Pyramid Model

Safety-science researchers posit that serious accidents are preceded by a larger number of
incidents that have limited impact or cause no harm (Bird & Germain, 1996; Heinrich, 1931;
This postulation is depicted variously as the Safety Pyramid (Bird & Germain, 1996; Heinrich, 1931; Hyden, 1987; Phimister et al., 2003), the triangle of accidents (Ritwik 2002), and the iceberg concept (Jones, Kirchsteiger, & Bjerke, 1999). Incidents at the peak of the triangle are referred to as accidents that result in obvious injury or loss, environmental impact, and significant downtime of production processes (Phimister et al., 2003). The lower portion of the pyramid consists of incidents that potentially may result in loss or harm. In this lower portion, near misses are situated between actual (but rare) accidents and behavioural acts (van der Schaaf, 1992).

Although near misses have minimal or no impact, they can provide insight into accidents that could happen (Phimister et al., 2003). Failure to identify and manage system flaws that surface as near misses may foreshadow catastrophic events. For example, prior to the 1986 Space Shuttle Challenger explosion, engineers had identified and reported degraded O-ring seals on previous missions. The night before the launch, management was warned of the potential for a catastrophic failure associated with lifting off at ambient temperatures below 53°F; subsequent lift-off temperature was 36°F (Vaughan, 1996). In 1997, an explosion at the Hindustan Petroleum Corporation refinery in Visakhapatnam, India resulted in 60 deaths and more than 10,000 metric tons of petroleum released into the atmosphere (Khan & Abbasi, 1999). Prior to this disaster, staff had submitted written complaints to management about corroded and leaking transfer lines subsequently identified as the source of the explosion. Another example is the 1999 Paddington railway tragedy in London, England that resulted in 31 deaths (Cullen, 2000). Prior to the crash, staff had recorded eight near misses between 1993 and 1999 at the precise location where the crash and explosion occurred. Failure to manage and respond to near misses (in these
latter cases: faulty O-ring seals, leaking transfer lines, and near collisions) that were brought to management’s attention led to devastating outcomes.

### 2.2.2.2 Accident Causation Model

The Accident Causation Model (also referred to as the swiss-cheese model) provides a systems approach to our understanding of accidents, errors, and near misses. This model adopts a human-factors approach whereby errors are viewed as a human cognitive function and are expected to occur in complex organizations (Reason, 1997). In this context, errors are viewed as a consequence of human fallibility and of upstream systemic factors and conditions. System defenses, barriers, and safeguards to mitigate potential failures or errors also underpin this model. These defenses occur at the organizational (personal safety equipment, standard operating procedures) and individual (cognitive function) levels within the work environment.

Using the accident causation model, Reason (1997) differentiates active and latent failures. Active failures are errors and failures at the point of contact between a human and some aspect of the larger environment or system interface. Such failures are more noticeable and are attributed to the actions or inactions of individuals. Active failures also are referred to as errors at the “sharp end,” while latent failures are less apparent and described as organization or design flaws that contribute to the occurrence of errors. Reason further distinguishes the types of active failures as slips, lapses, or mistakes (as shown in Table 3).
Table 3

Definitions of Failures

<table>
<thead>
<tr>
<th>Type of failures</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slips</td>
<td>Failure in the execution of an action as planned.</td>
</tr>
<tr>
<td>Lapses</td>
<td>Omission to execute actions as planned due to failure of memory.</td>
</tr>
<tr>
<td>Mistakes</td>
<td>Error of judgement, diagnosis, or application of procedure.</td>
</tr>
</tbody>
</table>

Less apparent failures are described as latent failures; they encompass organization or design flaws that contribute to the occurrence of errors that have the potential to cause harm.

This type of failure is similar to latent conditions which are defined by Perrow (1984) in the Normal Accident Theory as the collective psychology of an organization in which individuals are embedded. Poor design, limited supervision, and defects or failures in equipment are classified as latent failures. Reason’s (1997) description of active and latent failures builds on the accident trajectory depicted as the safety pyramid described earlier, and suggests that accidents are the result of the combination of active failures and a series of failed or unnoticed latent failures.

Reason’s notion of latent failures also closely resembles the definition and positioning of near misses in the safety pyramid. In resilient organizations, each defensive layer should be intact and should mitigate active and latent failures. However, given the view of human fallibility in complex work environments, a hole exists when the defensive layer is defective or not functional. As illustrated in Figure 3, the so-called swiss-cheese model is the symbolic representation of how errors (i.e., active failures) occur and are compounded by an alignment of latent conditions (i.e., “holes”).
The process of double checking—whether by a health care professional checking a single task twice or by two persons checking the same task—is a common defense in health care. In the case of administration of medications, pharmacists may check the physician’s original order with their database, or nurses may check the medication that the pharmacy dispensed prior to administration. Detecting and correcting an error at any of these points and subsequently giving the patient the proper medication is a typical example of a near miss; though the event may have passed through one or more defensive layers (as illustrated in Figure 3), the corrective action undertaken by the health care professional eventually closed off the “hole” to interrupt the error trajectory. Further exploration of the relationship of near misses and Reason’s theoretical concepts of active failures (i.e., slips, lapses, and mistakes) and latent failures in health care is warranted and may result in a more comprehensive understanding of how near misses are experienced and how they differ from adverse events.

Figure 3. Reason’s accident causation model. (Reason, 1997)
2.2.2.3 Safety System Migration Models

In contrast to the linear models, Cook and Rasmussen (2005), Amalberti (2001), and Amalberti et al. (2006) built upon Rasmussen’s (1987, 1994, 1997, 2003) earlier work and developed migration models predicated on the dynamic nature of sociotechnical systems. This work extends beyond the individual cognitive level explanation of error and situates safety and error in a larger context comprising economic, workload, and performance boundaries that form an envelope for the operating space (Cook & Rasmussen, 2005). Within Cook and Rasmussen’s Going Solid Model, a safe operating space occurs when the economic and workload demands are balanced so the operating space is contained within the boundaries of economic efficiency, workload, and performance. The operating point location is influenced by gradients that drift away from the workload and economic boundaries and towards the unacceptable performance boundary. Unsafe spaces occur when there is an imbalance in economic and workload boundaries and the shifting gradient moves across the boundary of optimal performance. In situations where the location of the operating point is uncertain, the dynamics of movement may lead to an unintentional crossing of the margin.

Amalberti (2001) and Amalberti et al. (2006) also include three boundaries: (a) individual and social/technical regulations, (b) market rules that push towards efficiency and quality, and (c) safety net rules and regulations. (Figure 4 illustrates Amalberti et al.’s (2006) Model of System Migration). These researchers also explain the mechanism by which deviance occurs and subsequently stabilizes, regresses, or progresses to harm. Within this model, near misses are delineated as close calls or violations. Violations are defined as unavoidable, deliberate deviations from safe operating procedures, standards, or rules. Violations are construed as by-products of the choice between competing intentions and expertise (Amalberti et al., 2006) and
are paradoxical in nature. On the one hand, they may increase performance and be reinforced by rewards systems or management; on the other hand, extreme violations can lead to actual harm or a catastrophic event.

![System migration model](image)

*Figure 4. System migration model. (Amalberti et al., 2006)*

The following scenario illustrates the system migration model: Individuals may select a less safe act or engage in workarounds and shortcuts in response to managing the demands and constraints of their environment. Over time, these actions may become the acceptable practice or cultural norm and may not be recognized by colleagues in the workplace as violations. This transgression of practices is initiated with a migration from a safe space of action to the unacceptable performance boundary. Events or situations that migrate to this space are still within the safety margin. Amalberti et al. (2006) define these events as borderline tolerated conditions of use (BTCU); they include near misses and violations in daily practice (Amalberti et
Vaughan (1996) describes the process whereby violations become a personal habit or routine, as the normalization of deviance. In this context, violations are not immediately sanctioned and people learn that regulations can be broken without consequence. This explanation is relevant to understanding why competent health care professionals may repeatedly engage in shortcuts and workarounds to regulations and safeguards.

Both the linear and dynamic safety migration models provide insight into how people learn and adapt to safety in a work environment fraught with gaps, hazards, trade-offs, and multiple goals. Though the linear and systems migration models offer explanations as to why near misses occur at the human-operator level, further empirical work is needed to determine if these models derived from other industries (nuclear, chemical processing, aviation, and railway) are applicable to near misses in the health care system.

2.3 Organization Theory

The system migration and the linear safety models do not reveal how the interactions of people in organizations influence the manner in which near misses are detected, responded to, and learned from. This is a shortcoming in the safety literature, as the delivery of health care in organizations relies upon social processes that occur at the clinical microsystem level where clinicians interact with patients to provide care. To address this shortcoming, this study draws on concepts from organization and management theory to shed some light on the processes that organizations engage in to learn from near misses. Key theoretical sources include the Model of First- and Second-Order Problem Solving, as well as a social perspective on learning.

2.3.1 Model of First- and Second-Order Problem Solving

The Model of First- and Second-Order Problem Solving (Tucker & Edmondson, 2003) expands upon Argyris and Schön’s (1978) and Argyris’s (1994) seminal theory on organizational
learning that identifies the latter as a cycle of developing and refining knowledge-in-use. This dualistic cycle requires both single- and double-loop learning: Single-loop learning describes situations where the individual identifies and corrects an error; double-loop learning occurs when an organization changes underlying conditions that contributed to the error. This type of learning includes changes to systems, policies, and norms that contribute to the likelihood of error. Tucker and Edmondson’s (2003) model is useful because it provides an overview of the types and nature of factors that contribute to organizational learning. This model was derived from observations of 26 nurses in nine hospitals (during 239 hours of observation time) and from interviews with 12 nurses from this sample group. Within this model, first- and second-order problem solving emerged as two key concepts delineating how learning takes place in organizations. Specifically, when asked how they dealt with problems, the most common response from nurses (n=93%) was that they identify and fix the problem at hand, which allows them to continue to care for the patient and/but to ignore the possibility of tracking the problem to its source and making system changes to prevent recurrence. If attempts to solve the problem were unsuccessful, nurses would most often ask a nursing colleague who was perhaps also a friend for help and would connect with others as a last resort. In only 7% of cases, nurses reported that they sought out further action by calling management’s attention to the problem.

These two types of learning reveal how nurses deal with issues and solve problems as they arise in daily work practices in health care organizations. Tucker and Edmondson (2003) focus specifically on errors in the health care system as the problem (or situation at hand) to be dealt with and managed. Single-order problem solving is described as situations whereby individuals detect and correct the error. This correction usually involves a worker who compensates for a problem by finding the information or resources required to finish the task on
his/her own. While the problem is solved for that particular situation, the individual then moves on to the next task related to the assigned work; consequently, the individual does not initiate communication, which in turn impedes organizational learning.

Single-order problem solving has explanatory value for health care professionals who are in the position to surface operational issues and safety threats on a daily basis. Similar to the Recovery Process Model’s trajectory, health care professionals often fix or correct an error before it proceeds to a negative outcome. By fixing and correcting the situation, health care professionals halt the progression towards an adverse event, though many practitioners may not make the cognitive connection that the situation was a near miss or severe enough to warrant reporting. Participants in Tucker, Edmondson, and Spears’s (2002) study, meanwhile, described validation of competence and professionalism associated with their ability to fix and correct problems. Instances of first-order problem solving that are fixed or intercepted before harm befalls the patient are often not reported, as they are viewed as superfluous with no perceived benefits associated with reporting (Chaudhry et al., 2003; Kaldjian et al., 2008; Leape, 2002). In the cases where an event does not get reported or shared, there is a greater likelihood that a similar problem will occur again in the organization.

With second-order problem solving, the involved individual not only resolves the situation but also takes action to address the underlying causes of the error (Tucker & Edmondson, 2003). This usually results in sharing information about the fixed or corrected error with colleagues and management in the form of a written report or informal conversations. In this situation, second-order learning gets “elevated” from an individual to a social process. Chaudhry et al. (2003) report such examples of near misses that were identified and discussed during rounds and informal discussions with house staff and health care professionals such as
nurses, pharmacists, and lab technicians. Furthermore, management’s role is a critical component of second-order problem solving. Tucker and Edmondson (2003) emphasize the importance of the manager in creating a work environment that is conducive to detecting, dealing with, and discussing errors through the necessary organizational channels. Addressing the underlying causes of errors and sharing lessons learned can improve organizational performance (Argyris & Schön, 1978; Bohmer & Edmondson, 2001; Carroll & Edmondson, 2002; Nutley & Davies, 2001; Tucker & Edmondson, 2003). A key part of the manager’s role is to provide timely feedback that empowers and encourages frontline health care professionals to be vigilant and responsive to safety threats that arise in their daily work.

2.3.2 Social Perspective on Learning

Although Tucker and Edmondson (2003) provide a useful model for identifying the interface between first- and second-order problem solving in everyday practice, the model’s focal point is mainly the individual within the organization. For example, Tucker and Edmondson focus on the role of management in providing feedback to the frontline provider who reported a near miss or error. They do not, however, explain how information is managed and shared at the organizational level in response to a reported near miss or error. In order to address this gap, I investigated organization and management theory that views learning in organizations as a social process.

Within this view, learning is reflective in nature and an intrinsic social activity whereby information is processed to reduce ambiguity (Daft & Weick, 1984). Through this lens, learning is a socially constructed process in which individuals construct meaning according to context; more exactly, learning occurs from individuals’ interactions with others within the complex organizations they work in (Brown & Duguid, 1991; Gherardi, Nicolini, & Odella, 1998; Lave &
Interactions amongst individuals within an organization in daily practice often involve schemas comprising rules, routines, or mental models (Antonacopoulou & Chiva, 2007). Learning shapes the emerging schemas that define the boundaries of action and opens up multiple ways of interaction that can influence or impede learning (Antonacopoulou & Chiva, 2007).

Organizations are thus collections of people who try to make sense of what is happening around them and who draw from past experience and organizational memory as a primary source of learning (Huber, 1991; Levitt & March, 1988; Weick & Sutcliffe, 2001; Weick, Sutcliffe, & Obstfeld, 1999). Learning involves the processes of scanning the environment, interpreting information in the environment, and learning in the form of taking action (Daft & Weick, 1984). Through this cyclical process, insight is acquired through information processing that in turn guides corrective action aimed at improving performance (Berta & Baker, 2004; Bohmer & Edmondson, 2001; Carroll & Edmondson, 2002; Daft & Weick, 1984; Nutley & Davies, 2001). Thus, organizational learning is defined as a process of improving organizational actions through better knowledge and understanding (Fiol & Lyles, 1985; Garvin, 2000).

What remains less understood is how the wider social and interpersonal processes influence organizational learning (Beck & Plowman, 2009; Dekker, 2007; Vincent, 2009). Empirical work has been scarce and limited to framework development and reviews (Tucker et al., 2007). A greater understanding of the social nature of learning and interactions amongst those in a work environment is important for the health care industry. Health care organizations are made up of smaller microsystems in which groups of clinicians interact daily with each other, with administrators, and with patients. Exploring the nature of learning from near misses in health care organizations will require attention to the social interactions, including varying perspectives, which
clinicians and administrators engage in the provision of patient care. Inquiry that involves the different cohorts may provide insight at an organizational level on whether different stakeholder perspectives on near misses influence their value as learning sources, and if there are opportunities for improvement. Such an exploration will provide both practical and theoretical benefits and present a more comprehensive view of how organizations make sense of, respond to, and learn from near misses.

Another gap in our knowledge involves the identification of organizational factors that influence or impede learning from near misses. Though prior work suggests conditions that increase the likelihood of errors may be different than those that foster catching, correcting, and learning from errors (Edmondson, 1996), this has not been explored empirically. Further exploration of what contributes to learning from near misses may pinpoint areas to target for corrective action that address systemic underlying causes of near misses.

2.4 Summary of the Theoretical Perspectives

In summary, it is worthwhile to explore and question the value of near misses as learning opportunities in organizations. What emerged from the literature review is that learning from near misses in health care cannot be explained comprehensively by a single theoretical perspective. This is not surprising, given the complex nature of health care and the relatively small scientific base that underpins safety events referred to as near misses. Thus, in an attempt to unravel the complexities associated with experiencing and learning from near misses in health care organizations, two distinct literatures were examined.

While there appears to be an overlap in the literatures—inasmuch as near misses and the subsequent response to near misses are influenced by individual, social, and organizational factors within a system—each theoretical position brings forward a perspective that may assist in
our understanding of this complex phenomenon. The error recovery and system migration models offer insight into mechanisms that influence safe and unsafe performance at the human-operator individual level. The problem-solving model and view that learning is socially constructed adds insight into the processes and factors associated with learning from near misses. Thus, these disparate bodies of theoretical perspectives informed this research.

What remains to be better understood is how social context and daily work practices influence health care professionals’ and administrators’ experience with detecting, differentiating, and responding to near misses in health care. Attention to individual, social, and organizational views is important, as together they may reveal how clinicians interact with each other and influence the way that near misses are detected and learned from in their daily work environments. Therefore, the aim of this research is to gain understanding of what processes and factors are associated with how near misses are recognized, recovered, and learned from in daily clinical practice in a health care setting.
CHAPTER 3: METHODS

An exploratory description through a grounded theory approach guided this qualitative study (Charmaz, 2006; Creswell, 1998). This approach was selected as there remains much to be understood about learning from near misses in health care. Chapter 3 provides a description of the underpinnings and principles of grounded theory, and then presents an overview of the study’s methodological implications and research orientation. This is followed by an outline of the sampling technique and constructivist grounded theory that guided the two phases of analysis (document and interviews). Finally, the study’s ethical considerations are highlighted.

3.1 Grounded Theory

Grounded theory emerged with Glaser and Strauss’s (1967) key study that provided a systematic approach to the analysis of qualitative data that would stand up to the standards set forth by the quantitative paradigm. This grounded theory approach moved the emphasis away from theory testing and towards theory generating in an inductive manner. As a research approach, grounded theory seeks to provide a rich description and understanding of a phenomenon by positing a theoretical explanation of the social processes inherent within human interactions (Crabtree & Miller, 1999). Through immersion in the data, the researcher develops conceptually dense categories that thoroughly and concisely represent the situation being observed (Denzin & Lincoln, 1994). In terms of methodology, grounded theory is designed to develop a well-integrated series of concepts that provide a theoretical explanation of a social phenomenon through analysis of data (Kennedy & Lingard, 2006; Strauss & Corbin, 1998). Grounded theory includes three core underlying elements: (a) an iterative approach to study design, (b) theoretical sampling, and (c) constant comparison analysis.
The grounded theory approach occurs in an iterative fashion whereby the researcher develops analytical interpretations of data as a means of focusing further data collection. These interpretations are then used to inform and refine theoretical analyses (Charmaz, 2006; Creswell, 1998), a process referred to as theoretical sensitivity (Glaser & Strauss, 1967; Walker & Myrick, 2006). Through this iterative process, the researcher moves through successive levels of data analysis and conceptual development to rename, reorganize, and redefine thematic categories (Kennedy & Lingard, 2006; Streubert & Carpenter, 1999). The successive levels include: (a) open coding, where similar data are grouped together and conceptually labeled; (b) axial coding, where the concepts within the codes are categorized and then linked by relationships that are organized by conditions and dimensions; and (c) selective coding, in which theory emerges through iteration and constant comparison of data (Glaser, 1978; Glaser & Strauss, 1967; Strauss & Corbin, 1990). As part of this process, purposeful sampling is employed whereby initial, predetermined criteria associated with the phenomenon of interest are used to recruit participants. As the data collection and analysis progresses, the participant recruitment becomes targeted to the evolving theory and concepts. This process is referred to as theoretical sampling (Glaser, 1978; Glaser & Strauss, 1967; Schreiber, 2001). Sampling continues to take place until theoretical saturation occurs, which is defined as the point at which the ongoing analysis of new data is not producing any new insights relevant to the emergent theory (Kennedy & Lingard, 2006).

A significant strength of grounded theory is its clearly articulated analytical process that has contributed to medical sociology, nursing, and social sciences literature (Kennedy & Lingard, 2006; McGhee, Marland, & Atkinson, 2007). Since the inception of grounded theory, a proliferation of different perspectives has moved the methodology beyond its origins rooted in the post-positivist paradigm (Kennedy & Lingard, 2006; Walker & Myrick, 2006). This
evolution is in response to the critical view of the decontextualized and atheoretical nature of grounded theory (Kennedy & Lingard, 2006). Decontextualization minimizes the personal and authentic aspects of the participants’ lived experiences and can lead to the separation of meaning from the story associated with the phenomenon being studied, thus “fracturing” or “shattering” the data (Conrad, 1990).

Charmaz’s constructivist approach to grounded theory is particularly germane to this study as it mitigates the likelihood of decontextualizing, fracturing, or shattering the meaning of the participants’ experiences. Because part of the analytical process involves reconciling the multiple social realities of people within their context, both context and theory are considered. Charmaz (2004) explores phenomena through social constructions that involve language and the shared meanings that people assign to a given phenomenon. Understanding the orientation of the principal researcher and the research team is an essential part of the iterative analysis (Goering & Streiner, 1996); in other words, it is necessary to consider the researchers’ biases or preexisting interests and experience (Madill, Jordan, & Shirley, 2000). Charmaz (2000, 2006) also refers to the “sensitizing concepts” related to this process, wherein the researcher aims to: identify and explicitly acknowledge his/her underlying assumptions and beliefs; apply grounded theory methodology to generate data; compare in a diligent way the sensitizing concepts against the data; and develop a theory explanation grounded in the data. This approach is further discussed in the Application of Constructivist Grounded Theory in Current Study section later in this chapter; the researcher’s orientation is described in more detail in the next section.

3.2 Methodological Implications and Research Orientation for Current Study

This study adopted Charmaz’s constructivist grounded theory because it builds on the critiques of the original grounded theory approaches and underscores the need for accuracy
through verification processes in qualitative research. To ensure methodological and theoretical rigor, this study employed the strategies discussed below.

The study incorporated contextual and theoretical elements to explain how organizations learn from near misses. I explicitly reflected on my perspective of the narrative data and the corresponding analysis to address potential decontextualization. This was achieved mainly through extensive memo-writing and conversations with my supervisor and thesis committee members. In turn, these reflections framed the sampling procedures to align the recruitment of study participants and to ensure that credence was given to their multiple social realities. (The sampling strategy is outlined in Appendix D.) Collectively, study participants represented health care professionals and administrators across multiple clinical settings.

The study used theory to inform the research process in order to avoid the “atheoretical” pitfall. This included a description of how theory was used to guide the development of the research questions and data collection processes. (See chapter 2 for a description of the theoretical perspectives.) Moreover, theory was also used to explain the findings that emerged through the analysis.

In order to avoid “forcing the data” and allowing it instead to emerge, I sought to accurately capture the voice of all stakeholders by balancing different constructions and their underlying value (Guba & Lincoln, 1989; Onwuegbuzie, Leech, Collins, & Zoran, 2008). To establish a theoretical explanation, I discussed and checked with study participants the key tensions that emerged over the course of the study. This iterative process also ensured methodological validity as the initial thematic codes were revised and refined through subsequent data collection and analysis. I then explored emergent tensions and theoretical
evidence in more depth through memo-writing, the evolving coding schema, iterations of results papers, and discussions with the thesis committee.

My professional identity encompasses the roles and responsibilities of a clinician (i.e., nurse), an educator, an administrator; and a health services researcher. With regards to research objectives, I have been directly involved as a clinician in near misses (although they were not classified or described as such in the 1990s) and in other studies that explored or continue to investigate the meaning of near misses in acute, long-term, and mental health care settings (Jeffs et al., 2008). At administrative, educational, and policy levels, I have grappled with the primary focus on adverse events or errors and the invisible or lost opportunities for learning from near misses in health care. I have assimilated theoretical and empirical bodies of knowledge (described in chapters 1 and 2), course materials, and the requirements for a literature review that were outlined in this work’s dissertation proposal. In short, my collective professional beliefs, values, experiences, and the current state of science constitute the sensitizing concepts (posited by Charmaz) that underlie the research orientation for the current study.

In addition, three other members of the research team have contributed to my orientation as a researcher within this particular study: Dr. G. Ross Baker, my thesis supervisor and a sociologist who specializes in patient safety and quality improvement; Dr. Lorelei Lingard, a rhetorician and education scientist with expertise in grounded theory and discourse analysis; and Dr. Whitney Berta, a management and health services researcher who has expertise in organization and management theories.

3.3 Setting and Sampling Strategy

The study selected as its sample organization a large academic health sciences centre. Criteria for selection included a strong corporate commitment to patient safety initiatives and a
reporting system that captured near misses. In 2004, the study site had initiated a Web-based
safety reporting system that incorporated an anonymous reporting feature. Near misses are
categorized as potential occurrences in the event-reporting classification system. Near misses
constituted 22.5% (788:3504) of reported safety events from January to October 2007 and 22.6%
(862:3804) of events from January to October 2008 (Hospital X staff member, personal
communication, December 11, 2009). Within this system, managers have access to reports in
their clinical areas that they can use to identify trends and opportunities for improvement. Other
key strategies to enhance reporting and learning from near misses that the study site implemented
include: (a) a “good-catch” section in the hospital’s patient-safety quarterly newsletter; (b)
reports in biweekly hospital newsletters; (c) education sessions for quality leaders and managers;
and (d) hospital morbidity and mortality sessions. The study opted for a teaching hospital rather
than a community hospital because the former: (a) has a greater incidence of adverse events and
near misses (Baker et al., 2004) and (b) employs a greater range of health care professionals.

Purposive sampling was employed to capture the multiple perspectives of study
participants. This sampling approach is consistent with constructivist grounded theory and drew
from two cohorts4: (a) administrators responsible for the operation of clinical services (e.g.,
directors, managers, and department chiefs) or who functioned in a supportive role to clinicians
(e.g., risk manager, clinical manager); and (b) clinicians responsible for the provision of clinical
services. Inclusion criteria included health care professionals and/or administrators who (a) had
experience with near miss occurrences; (b) had safety and quality responsibilities within their
portfolio/position; (c) understood English; and (d) were able to provide informed consent.

4 The original proposal identified three stratified cohorts that differentiated corporate leaders
from middle managers. Through theoretical sampling, these latter two were collapsed into a
single cohort.
As part of the purposeful sampling approach, I met with the health centre’s Director, Quality and Risk Management to identify the initial round of study participants using the inclusion criteria. From this initial list, an email was sent out to the individuals who were identified as potential study recruits. For those individuals who indicated that they would participate, a meeting was set up at a convenient time at the participating hospital. In total, 25 interviews were conducted with 24 study participants who included managers (middle and senior) and clinicians in four units (two intensive care units, a general medicine unit, and an emergency department) and three departments (blood transfusion, pharmacy, and quality and risk management) of an academic health science centre in a large Canadian city. Further description of the sample hospital is not possible without providing characteristics that may identify specific study participants. The final sample size was determined by theoretical saturation where no new insights were gained for analysis (Charmaz, 2006; Strauss & Corbin, 1990). The sample size is consistent with other grounded theory studies that required 20 to 30 interviews to achieve theoretical saturation (Creswell, 1998; Tucker & Edmondson, 2003).

3.4 Application of Constructivist Grounded Theory in Current Study

A constructivist approach to grounded theory seeks an interpretive understanding of subjects’ meanings and a definition of conditional statements that interpret how subjects construct their realities (Charmaz, 1990, 2000, 2006; Guba & Lincoln, 1994). The reflexive nature of this approach sees the researcher as co-creator of the interpreted reality of those being studied. Constructivist grounded theory seeks out tacit meanings of the participants and the researchers alike (Madill et al., 2000), and attention to the historical and current contexts of subjects’ meanings is essential (Charmaz, 2006). As the inquiry progresses, the researcher engages in interpreting the meaning, actions, and nuances that are emerging in the data and
analyses. This interpretive lens assumes that multiple social realities exist rather than a single, universal truth. Within this approach, recognition of the emergence of categories and the theoretical level of analysis are a result of the researcher’s interactions within the field and his/her questions about the data. The researcher must be able to identify and negotiate the tensions between divergent or contradictory constructions of stakeholders (Onwuegbuzie et al., 2008). These tensions are representative of the different ways of knowing, experiencing, and valuing amongst the various stakeholders. The current study involved a two-phased approach that used an initial document analysis followed by semi-structured interviews with study participants. These are described in more detail in the following two subsections.

3.4.1 Document Analysis

As mentioned earlier, I met with the Director, Quality and Risk Management of the participating study site as an initial step in this study. At this meeting, I provided an overview of the study including the overall purpose and sampling strategy, and requested relevant documents including annual reports, a corporate plan for safety, related ongoing accountability/monitoring reports, and de-identified exemplars of near misses. A review of the documents provided both: (a) historical and contextual data on the organization’s response to patient safety (Neuman, 1994; Spradley, 1979) and (b) near miss exemplars that were used to ensure the questions included in the interview guide were contextually relevant and that the study would recruit individuals from areas where near misses had been reported.

Documents were analyzed using textual analysis included in Charmaz’s (2006) constructivist grounded theory methodology. According to Charmaz, people construct texts for specific purposes and they do so within social, economical, historical, cultural, and situational contexts. In total, 18 documents were reviewed. The documents included: four published journal
articles; six corporate patient safety plans; five annual reports; two policies and procedures manuals; and one newsletter. Specifically, documents were reviewed and analyzed for the plans and corresponding actions that the health care organization has put in place to address patient safety and near misses. In addition, specific examples of near misses were examined to gain an understanding of the local historical and current contexts. The document analysis elucidated a definition of near misses as “potential occurrences” which also included “close calls” in the sample site’s safety and reporting policy. Within this organization, potential occurrences are defined as “any event or situation that could have reached a person but did not because of chance or timely interception.” Examples of potential occurrences included: wrong dose of medication ordered but not administered; wrong blood cross-match but blood not administered; incorrect sponge count but no sponge left in patient; uncapped needle found in linen but no resulting needlestick injury; puddle of water found on floor but no one slipped; and a computer left unsecured with confidential information in view.

Overall, the document analysis revealed an espoused commitment to learning from near misses and patient safety. This is evident by the following excerpt from the document analysis: “Emphasis on the reporting of potential incidents and close calls is essential as it allows for learning without the human toll associated with actual events.” Descriptions of the vision, objectives, and strategies associated with learning from patient safety events included in the documents supported key concepts from safety science. As a result of the document analysis, near misses (described as potential occurrences\(^5\)) and related examples were embedded into the first interview question as prompts. (See Appendix E for more details on the document analysis.)

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\(^5\) All participants were aware of the term “near misses” and fewer were familiar with the term “potential occurrence” that is used to describe these types of patient safety events in the corporate reporting system and corresponding policies.
3.4.2 Phase II Semi-Structured Interviews

An iterative, analytical process using constructivist grounded theory was integrated into the interview data. The research questions and interview guide questions were open and general to enable emergent theory to account for the processes, factors, and conditions in the practice environment that are relevant to the study participants (Charmaz, 2006). A constructivist grounded theory approach recognizes that while initial research questions may be concrete and descriptive, deep analytical questions may arise from studying the data later in the research process (Charmaz, 1990). As an initial data collection instrument, a semi-structured interview guide was informed by the literature related to near misses and organizational learning and the document analysis. Semi-structured, open-ended interviews that included prompts were used to stimulate dialogue and discussion. Semi-structured interviews are used when there is a good understanding of what questions to ask but answers cannot be predicted (Morse & Field, 1995). Short questions that serve as prompts are recommended to obtain information while simultaneously enabling the study participant freedom to respond and illustrate concepts (Morse & Field, 1995). The initial interview guide (see Appendix F) was pilot tested with study participants to ensure the questions and prompts elicited experiences and perceptions associated with near misses. This phase of the study involved 6 study participants—4 administrators and 2 clinicians. The researcher met with the thesis committee to review the findings from the pilot interview and revised the latter by adding additional prompt questions. At this meeting it was also determined that the additions were not substantive, and so the first 6 interviews were included in the final analysis. Interviews ranged from 16 to 55 minutes in length (averaging 30 minutes) and were conducted, digitally recorded, and transcribed by the principal investigator.
Informed consent was obtained from all 24 study participants. Participants were assigned codes that were used throughout the analytical process.

Data analysis included the following processes: Each transcript was reviewed line by line for key words and phrases that were identified as being relevant to the participant’s meaning and experiences associated with near misses and organizational learning. This initial line-by-line data coding enables the researcher to use sensitizing concepts and to refine and specify borrowed extant concepts (Charmaz, 2000). Next, the verbatim words and phrases from the transcript were organized under an initial coding scheme. This coding schema was further refined and expanded upon by the iteration and constant comparison of the initial active and selective/focused codes derived from the narrative data. The refinement of the coding schema in this study was consistent with the constructivist grounded theory approach; that is, initial active codes were developed, followed by the development of selective or focused coding that formed subsequent categories which in turn shaped the developing analytical framework (Charmaz, 2000, 2006).

Within and across these three steps, the researcher generates active codes and subsequent categories that enable comparisons (Charmaz, 2000). For this study, the constant comparison method cross-referenced: (a) different people; (b) data from the same individuals across multiple points in time; (c) incident with incident; (d) data with category; and (e) category with other categories (Charmaz 2000). Coding is used to conceptualize the data by analyzing or identifying patterns through memo-writing. In addition, the researcher made notes on the original transcripts that initially included cursory points of similarities (or convergence) and differences (or divergence) from existing theories. These were flagged for further examination during the memo-writing component of the analysis in which various processes, assumptions, and actions
are elaborated upon (Charmaz, 2000). Memo-writing assists researchers to: (a) grapple with ideas about the data; (b) set an analytical course; (c) refine categories; (d) define relationships among various categories; (e) elaborate on processes and patterns identified within the categories to formulate emergent theoretical constructs; and (f) gain a sense of confidence and competence in their ability to analyze data (Charmaz, 2000; Giske & Artinian, 2007; Kennedy & Lingard, 2006).

As part of the theoretical sampling process, the semi-structured interviews occurred in a fluid manner between the two cohorts (Charmaz, 2000); that is, the researcher cross-referenced the heterogeneous sample of administrators and clinicians to verify data accuracy (Creswell, 1998). For example, during one of the interviews, a study participant expressed the view that near misses occurring in ambulatory care areas in the hospital differ from those occurring in the inpatient units. To explore this view, the researcher sought out a clinician working in the ambulatory clinic. During the analytical phases, the researcher maintained close contact with her supervisor to discuss any emerging theoretical tensions and inconsistencies. During the committee meeting, the focus was primarily on the plausibility of initial and evolving explanations that emerged from the data set associated with how clinicians and administrators experienced learning from near misses. Summary notes from these discussions and iterations of the results papers were part of a larger audit trail of all analytical memos included in the final analysis. The final coding schemas were applied to all transcripts for cross-referencing and as a key verification strategy.

3.5 Ethical Considerations

Ethics approval was obtained for this study from the sample hospital’s research ethics board in November 2007 and from the University of Toronto in December 2007. A
comprehensive sampling strategy (see Appendix D) was developed to ensure methodological soundness and to achieve theoretical saturation within an ethical framework.

As part of the informed consent process, the researcher provided potential recruits with an overview of the study and asked them to read the informed consent forms. Study participants had to sign a consent form for the interview (see Appendix G) and another for the video/audio taping (see Appendix H) prior to participating in the interview. Due to the sensitive nature of collecting data on near misses, the researcher emphasized the confidentiality of the study to all participants prior to the interview. In addition, study participants were informed that they could withdraw from the interview at any time without repercussion to themselves or to their families. Informed consent was obtained from all 24 study participants. Informed consent forms have been stored separately from the transcription data in a secure, locked cabinet. Participants were de-identified and assigned codes that were used throughout the analytical process. The signed consent forms, audio tapes, transcripts, and analytical notes will be stored in a locked cabinet for 10 years; only the researcher and the research team can access these data.
CHAPTER 4: VISIBILITY AND IMPORTANCE OF NEAR MISSES IN EVERYDAY CLINICAL PRACTICE

This chapter explores how clinicians and administrators identify and differentiate near misses in everyday practice and addresses key theoretical and empirical gaps related to: (a) how clinicians and administrators identify and differentiate near misses, and (b) the circumstances and mechanisms affecting how near misses become visible and are deemed consequential in everyday practice. The methods section in this chapter is an abridged version of what is outlined in chapter 3 and is written as the methods component of a publishable manuscript. The concept of “cognitive downgrading” is put forward as an essential theoretical explanation of what influences the detection of near misses. Study findings draw attention to how individual clinicians cognitively process events and interact with others within daily practice to determine if the event is a near miss and perceived as having consequences. The acceptance of near misses as a routine part of daily practice has a paradoxical effect on the visibility of near misses. Practical implications are described briefly in this chapter and are elaborated in chapter 7.

4.1 Introduction

Near misses are viewed as valuable sources of learning that point to system vulnerabilities and improvement opportunities in health care organizations (Barnard, 2006; Coyle, 2005; Grant & Larsen, 2007; Henneman et al., 2006; Kanse et al., 2006; van der Schaaf, 1992). In Canada, many health care organizations include near misses in their organizational reporting systems. The inclusion of near misses in reporting systems is part of a required accreditation standard (Accreditation Canada, 2008). Yet, despite the supposed value of near misses as learning opportunities in health care, they continue to be infrequently documented and sometimes are unnoticed (Hurwitz & Sheikh, 2009). To harness the learning potential of near
misses, they must be apparent to persons working in the organizations; in other words, practitioners must understand what constitutes a near miss before they can detect such an occurrence.

What is currently known about near misses is derived from classification schemas developed in safety science. To date, however, efforts to apply these classification schemas to health care have resulted in a variety of definitions of near misses due to the complex nature of such occurrences in the health care environment (Ginsburg et al., 2009; Jeffs et al., 2008). Many of these schemas have origins in industries other than health care. Moreover, scant empirical work explores whether such definitions are even applicable to health care or how clinicians detect near misses and distinguish them from adverse events, resulting in a knowledge gap that may limit clinicians’ ability to identify and subsequently learn from near misses in health care (Henneman et al., 2006). Consequently, this study examines how clinicians and administrators in one health care organization recognize and differentiate near misses in practice. A key part of this examination is to find out if existing assumptions related to safety-science models of error recoveries and no-harm events are applicable in health care. More specifically, the study seeks to identify (a) how near misses are defined in clinical practice, and (b) the circumstances under which near misses become visible in clinical practice. Study findings thus provide insight into the nature of near misses and the mechanisms that trigger their recognition in clinical practice.

### 4.2 What We Know About Near Misses

While near misses can summarily be described as recovered initial failures that do not result in harm, researchers offer various definitions of near misses in health care (see Appendix C: Survey of Near-Miss Definitions). A key discrepancy is that some authors designate near misses as events that reached the patient without causing harm, while others believe that any
event that reaches a patient is not a near miss. Variations in definitions stem partly from their use in various models in safety science that describe error and accidents. The traditional view of near misses includes sequential, linear models. Within the Safety Pyramid Model, near misses are situated between accidents that result in obvious injury or loss, and less obvious incidents that can potentially but do not result in loss or harm (Bird & Germain, 1996; Heinrich, 1931). In the Eindhoven Model of Incident Causation, near misses refer to occurrences with potentially significant safety-related consequences that were prevented from developing (van der Schaaf, 1992). A near miss occurs when an initial failure (i.e., organizational, technical) or deviation (i.e., human) is detected and mitigated, resulting in no harm or negative outcome. In contrast, an accident occurs as a result of the initial failure not being detected and/or because of ineffective defense mechanisms.

Other researchers claim that the linear, sequential models isolate system performance at points in time and minimize longitudinal, cultural, and social effects (Dekker, 2003; Hollnagel, 2004; Woltjer, 2009). In addition, they argue that these models do not sufficiently explain the complex nature of near misses; therefore, they call for systemic models to address this gap in understanding safety and error (Dekker, 2007; Hollnagel, 2004; Leveson, 2004). Cook and Rasmussen (2005) and Amalberti et al. (2006) have applied the Systems Migration Model to health care. The premise of this model is that migration between safe and unsafe acts is influenced by multiple pressures and constraints operating within a social context. Amalberti et al. (2006) categorize near misses as close calls or violations that are deliberate deviations from safe operating procedures, standards, or rules. Thus, in the system migration models, near misses are events that have the potential for harm but do not cross the acceptable performance boundary (Cook & Rasmussen, 2005).
Following the lead of safety science models, near misses in health care have been conceptualized as initial failures that are recovered before they cause harm (Jeffs et al., 2009; Kanse et al., 2006; Mick et al., 2007; Tamuz et al., 2004). Most recently, Ginsburg et al. (2009) conducted focus groups with administrators (patient safety officers and patient care managers, including pharmacy managers) and with frontline nurses and allied health care professionals. Findings from the focus group analysis extend our understanding of near misses by differentiating between minor and major near misses. Minor near misses are defined as events that would have resulted in no harm or minimal temporary harm to the patient if not for timely intervention or because of good luck; major near misses refer to events that would have resulted in death or serious physical or psychological injury if not for the same reasons (Ginsburg et al., 2009).

Recent empirical work with clinicians elucidates near misses as paradoxes in everyday clinical practice (Jeffs et al., 2008) and as an important and complex phenomenon (Ginsburg et al., 2009). Study findings suggest that the manner in which clinicians experience near misses is highly contextual and influenced by several factors in the health care setting; what is less understood are the circumstances under which near misses are detected or, conversely, go completely unnoticed in daily clinical practice. Previous theoretical work has described near misses as events that involve individual operators working in organizations. Within this body of work, researchers seek to identify how the social nature of the work environment influences clinicians’ ability to detect safety threats in their daily work environment (Hoff & Sutcliffe, 2006; Woltjer, 2009). To this end, the present study explores and contributes to a deeper understanding of how health care professionals construct meaning and differentiate near misses from other safety events in practice.
4.3 Methods

This study uses a constructivist grounded theory approach that provides an interpretive understanding of how subjects construct their realities (Charmaz, 2006). The initial interview guide was pilot tested with 6 study participants to ensure the questions and prompts elicited experiences and perceptions associated with near misses. Interviews ranged from 16 to 55 minutes in length and were conducted, digitally recorded, and transcribed by the principal investigator. In total, 25 interviews were conducted with 24 study participants who included managers (middle and senior) and clinicians in four units (critical care, neonatal intensive care, general medicine, and emergency) and three departments (blood transfusion, pharmacy, and quality and risk management) of an academic health science centre in a large Canadian city.

Informed consent was obtained from all 24 study participants. Participants were assigned codes that were used throughout the analytical process. The final sample size was determined by theoretical saturation where no new insights were gained for analysis (Charmaz, 2006; Strauss & Corbin, 1990). This sample size is consistent with other grounded theory studies that required 20 to 30 interviews to achieve theoretical saturation (Creswell, 1998; Tucker & Edmondson, 2003).

Interview data were analyzed using an iterative approach. The principal investigator reviewed each interview transcript both separately and in batches. The analysis included the following steps: (a) line-by-line active coding of how near misses were described; (b) selective and focused coding that built on the frequent initial active codes; (c) memo-writing that explored and elaborated on assumptions, processes, and actions subsumed under codes; and (d) theoretical construction (Charmaz, 2006). In order to construct theoretical explanations from the narrative data, the principal researcher presented, elucidated, and checked with team members the key
tensions that emerged over the course of the study. This iterative process also ensured methodological rigor as the initial thematic codes were revised and refined through subsequent data collection and analysis. Theoretical explanations were then explored in more depth through memo-writing, the evolving coding schema, and discussions with the research team.

4.4 Results

Study participants varied in their perceptions and definitions of near misses. (Table 4 provides an overview of the key points reported by participants.) The clinicians described near misses as “running the gamut” and “ranging on a vast scale from minor things to pretty significant errors.” The most commonly described near misses were errors made by one clinician that were then detected and corrected by another (i.e., a colleague). These examples usually involved medication or treatment errors discovered during the double-checking process, prior to being administered to the patient. Study participants also described near misses as events that reached the patient or that involved an omission or delay in care with no harm or untoward effect. The averting of harm in the cases where the error reached the patient was often attributed to luck, fate, or an act of God. Clinicians and managers alike disagreed on whether events that reached the patient but did not cause harm were errors, as opposed to near misses. In some cases, an event that reached the patient was viewed as an error, and viewed as a near miss if it did not reach the patient. An administrator shared the following example:

I think that’s the confusing thing around [a] near miss because people think that it has to do with the degree of harm as opposed to whether or not the event actually reached the patient. And so they will classify something as a near miss that actually reached the patient, but it was not a miss at all, but that it did not cause the degree of harm that it could have.
Table 4

Properties of Near Misses

<table>
<thead>
<tr>
<th>Properties</th>
<th>Representative transcript excerpts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Errors that are picked up, caught and corrected before reaching patient that are potentially harmful.</td>
<td>“People probably don’t think about minor corrections to an order being a near miss, you know if somebody actually gave the ten times dose of morphine, there would be consequences.”  (Advanced Practice Nurse)</td>
</tr>
<tr>
<td></td>
<td>“Most of them are caught at the time of pharmacy processing or nurses doing the double checks.”  (Director)</td>
</tr>
<tr>
<td>No harm done or untoward effect</td>
<td>“It didn’t do either baby any harm but it could have been incredibly serious.”  (Medical Doctor)</td>
</tr>
<tr>
<td></td>
<td>“Sometimes they do reach the patient and they may not have any impact ”  (Director)</td>
</tr>
<tr>
<td></td>
<td>“There was no effect, because the amount that was given, you get a lot of contrast in CT, and in MRI you give minimal amounts of contrast, so it was a minimal amount of the CT contrast, so it was minimal. So the only possible harm to that person was if they had to have repeated CTs and they built up an allergic reaction to having had that. … It was minimal, but it was still a mistake.”  (Nurse)</td>
</tr>
<tr>
<td>Delay or omission of care</td>
<td>“The other near misses I think are related to the non-delivery of treatment—by missing the opportunities to deliver antibiotics in a timely fashion or by not treating seizures in a specific way.”  (Medical Doctor)</td>
</tr>
</tbody>
</table>
A number of factors influence the recognition of near misses, including the nature of the event itself, how clinicians and their colleagues perceived the event amidst other clinical priorities, routines in daily practice, and how near misses are defined in organizational policy. Each of these factors is described below in more detail and accompanied by supporting narrative excerpts.

First, the ability to detect and interpret a near miss is partly contingent upon the event itself—the more visible the event, the more likely it will be identified and corrected. Participants concurred that events were near misses when they were perceived to have had the potential for but did not result in harm. The participants listed self-extubation of patients, drug errors that were caught or intercepted, and technical failures with equipment as examples of near misses, as illustrated in the following observation by a medical doctor:

I think ones that are very easy to catch are the inadvertent or self-extubation of patients that are being ventilated. For example, equipment failure around the ventilator of the patient, because it’s so obvious; they are easy to do and they may be associated with a very significant outcome or a very minor outcome because they are usually picked up or always picked up.

Second, the view of near misses as non-events varied according to clinicians’ perspectives. For example, a prescription error that was intercepted before reaching the patient was considered a near miss by a dietitian and by an advanced practice nurse; however, according to another participant, the physician who wrote the original prescription described the scenario as a non-event and of no clinical importance. In this clinical scenario, the dietitian and the nurse perceived the event as a near miss because it was detected during a double-check and did not reach or harm the patient. In contrast to the previous scenario, another physician described prescription errors picked up by the pharmacy as near misses: “Typically, drug errors in ordering
[are intercepted] because our pharmacy truly does a fabulous job of picking up errors in ordering and therefore they’re always near misses because the pharmacy picks it up before it goes out.”

Clinicians were also influenced by their colleagues’ and administrators’ views of near misses. Many near misses were described by participants as part of daily practice and were deemed inconsequential. This view was mainly attributed to the perceived frequency and no-harm nature of near misses, which become inconsequential amidst competing priorities around preventing harm and protecting the patient. As one nurse described it, near misses can “fall off the priority list” in the context of daily practice. Several participants noted they sometimes did not realize an event was a near miss, or they simply did not think about near misses due to the sheer volume of work and multiple priorities. Many potential adverse events were detected and rectified at a moment in time without any acknowledgement that a near miss had taken place, as illustrated in the following narrative:

I think people just think, “oh well, phew, we caught that, let’s go on.” You also think of it as, “good for me,” you know, “I caught that,” or whatever. Because we do catch quite a few things between, you know, all the allied health professionals, nursing and whoever, since we talk to each other that we catch things and I guess people don’t consider those near misses. (Occupational Therapist)

The concept of cognitive downgrading emerged to describe how individual clinicians cognitively process events within their daily practice to determine if the event is a near miss and perceived as having consequences. As one advanced practice nurse described:

I think that there is a process that we use cognitively to downgrade it in our minds, the whole human error factor; “phew that was close but nothing happened, so it’s okay, we caught it.” Or I think that we downplay them. (Advanced Practice Nurse)

Third, accepting near misses as a routine part of daily practice is also influenced by socialized disciplinary roles. Pharmacists, dietitians, and nurses believe that catching and correcting medication and parenteral nutrition order errors prior to administration to the patients
is an integral part of their daily practice. The physicians also described the key role of pharmacy to catch prescription errors, though such errors are often detected by the more experienced clinicians who are able to pick up, recognize, and clarify orders and care processes that other clinicians had initiated as part of their daily practice. As one experienced dietician noted:

   I don’t want to say the norm, but that is what I am saying, like [near misses] almost become a part of daily functioning around here: “oh, that doctor wrote the TPN order, I better go check because I know there is going to be a mistake on it.” I go and I do it and I follow up because that is just part of my job.

Interestingly, a pharmacist viewed the double-checking of prescription orders as a routine practice but did not classify errors, when caught, as near misses: “to me they are not near misses because you know, again it is part of routine practice of what you are checking, the prescription.”

Although some participants classified the detection of prescription errors as near misses, others had difficulty recalling such occurrences; as one dietitian said: “I have a million examples [but] I can’t think of what they are, so obviously it is something that’s fairly common.”

   At times, near misses became conspicuous after the event had occurred through informal conversation and anecdotal stories. Study participants described hearing about near misses “through the grapevine” of informal discussion amongst colleagues working together in a clinical area or department. Near misses also were discussed at morbidity and mortality rounds. This surfacing of near misses through informal dialogue or through review at morbidity and mortality rounds sometimes revealed that a near miss had come close to harming the patient. As one manager put it:

   I guess a lot of the time with the near misses …you don’t realize it’s a near miss until people start talking about it… that often comes up…you know, it sort of evolves and you realize after talking about one little issue, how close you came to, how close it came to the patient.
Fourth, study findings reveal that organizational factors also influence how individual clinicians detect and ascribe meaning to near misses. For example, some participants noted that the organizational policy on reporting includes a series of definitions of near misses that are ambiguous. This confusion can lead to clinicians not viewing the event they experienced in clinical practice as a near miss. This is evident in the following narrative by a corporate risk manager:

One of the reasons [confusion exists and clinicians may not recognize near misses in practice] is the way we categorize our near misses …didn’t reach the patient, but it had potential for minor harm; didn’t reach the patient, potential for major harm. We also throw into that mix of a near miss is minor or no harm, but potential for major harm so it covers ones that actually get to the patient but didn’t cause harm.

4.5 Discussion

A growing number of studies posit near misses as events that highlight system vulnerabilities and quality improvement opportunities (Barnard, 2006; Coyle, 2005; Grant & Larsen, 2007; Kanse et al., 2006). To date, the literature has yielded a variety of definitions of near misses drawn from other safety-critical industries and patient safety experts. What remains less understood is if these definitions are reflective of clinicians’ and administrators’ experience with detecting near misses in daily clinical practice, and/or why near misses continue to go unnoticed, are deemed inconsequential, and are not reported. Consequently, this study sought to discover if the literature fully explains how near misses are experienced in everyday clinical practice. Study findings support the literature’s definition of near misses as no-harm events (Aspden et al., 2004) that mainly involve error recovery processes (Henneman et al., 2006; Kanse et al., 2006; van der Schaaf, 1992) and remain in the safe performance margin (Amalberti et al., 2006; Cook & Rasmussen, 2005). Variations in study participants’ definitions of near misses also are similar to what has been previously described in the literature.
A key contribution of study findings to safety science is the dynamic nature of how individuals make sense and give meaning to safety events. This explanation includes the observation that the process of cognitive downgrading was not confined to individual level factors. Previous work focuses mainly on individual level explanations. For example, degraded hazards in the mining industry are described as events that disappear into the normal scene as they get relegated to short-term memory (Allnut, 2002; Perdue, Kowalski, & Barrett, 1994). In these situations, the human operator forgets the details of the events and moves on to the next task at hand (Kowalski, Barrett, & Fotta, 1995; Perdue et al., 1994). This is similar to the concept of cognitive stacking, the process whereby nurses re-prioritize the numerous tasks to be completed for their assigned patients amidst several interruptions (Ebright, Patterson, Chalko, & Render, 2003; Potter et al., 2005). In a study exploring cognitive stacking, nurses would manage caring for patients amidst multiple interruptions that were deemed routine in practice (Potter et al., 2005).

The concepts of degraded hazards and cognitive stacking suggest that there is a weighting process that individuals engage in to manage daily tasks in their work environment. This provides a potential explanation for the category of near misses in which a clinician initially detects a near miss and subsequently deems it inconsequential amidst competing priorities in daily practice. However, such concepts do not offer an explanation as to how the social context influences the weighting process. Further, they do not explain why events are not initially recognized as safety threats. The concept of “cognitive downgrading” that emerged in this study provides further insight into why near misses become a socially accepted and routine practice. This insight includes an explanation beyond the individual and work constraint factors to include social interactions that influence whether near misses are recognized as important or
inconsequential safety events. How clinicians and administrators ascribe meaning to near misses as safety events is a result of how individuals and colleagues viewed near misses; the influence of daily work routines; and how near misses are defined in organizational policy. Ascribing meaning to near misses is a dynamic and complex phenomenon, and no specific patterns emerged that explain exactly why an event is interpreted as a near miss. Interestingly, participants’ descriptions of routine or daily occurrences position near misses as ambiguous phenomena visible to some practitioners while invisible to others. Near misses compel follow-up action on the part of some practitioners, but are not deemed sufficiently consequential to merit action by others.

4.6 Limitations

Although this study provides insight into how clinicians and administrators perceive near misses in their everyday practice, it is limited by data collection from a single academic acute-care hospital setting. The conceptualization of cognitive downgrade (i.e., of near misses as no-harm events that mainly involve recovery processes) may not be transferable or relevant to other health care settings; this will require further study and validation.

4.7 Implications

The description of how clinicians’ cognitive processes and their interactions with other practitioners help determine if an event constitutes a consequence-laden near miss is a key contribution. The acceptance of near misses as a routine part of daily practice has a paradoxical effect on their visibility—whether they are detected in the first place and, if detected, whether or not they are viewed as consequential.

The study findings have important implications for organizational practice and research seeking to understand patient-safety events. In the practice realm, organizations need to
acknowledge that clinicians’ view of near misses is highly contextual and ambiguous in nature. In this study, many clinicians believed organizational policy was unclear or did not encompass what clinicians experienced in daily practice. One possible response might be to include a wide range of near miss examples in the organizational policies and educational materials for clinicians and administrators. Efforts are also required to make near misses more visible and therefore more likely to be deemed as consequential in daily clinical practice. Given that near misses are minimized or less likely to be recognized amidst competing priorities, efforts should be aimed at enhancing situational awareness in daily practice routines (Schwid & O’Donnell, 1992). A roster of visual cues that are tailored to specific health care settings and serve to alert clinicians to the near misses and safety threats in their complex, chaotic environments might facilitate visibility and action (Taylor-Adams, Brodie, & Vincent, 2008).

This study also has important implications for research on understanding patient safety events. The dynamic and ambiguous nature of how near misses were experienced needs to be explored in other health care settings. Further exploration of the concept of “cognitive downgrading” and the paradoxical effect of the routine nature of near misses on rendering near misses invisible in other health care settings is required. From this foundational work, a greater understanding of how clinicians detect and respond to near misses and safety threats in daily practice can inform future intervention studies.
CHAPTER 5: NEAR MISSES AT THE EDGES OF THE SAFETY MARGINS: VIGILANCE AND VIOLATIONS IN CLINICAL PRACTICE

This chapter explores how the routine nature of near misses involves interplay of collective vigilance and violations in clinical practice. This extends what was presented in the previous chapter regarding how the perception of near misses as a routine part of daily practice can inadvertently render them invisible and inconsequential. The methods section highlights the relevance of the approach selected for the study to address the key aim of gaining insight into multiple perspectives of clinicians and administrators as they experience and respond to near misses in their daily practice. Study findings discussed in this chapter highlight how health care professionals and organizational factors influence responses to near misses in daily practice; the theoretical position here is that the trade-off between collective vigilance and violations produces unintended consequences of eroded safety and decreased performance. While this chapter focuses on theoretical relevance, implications related to results are examined in chapter 7.

5.1 Introduction

In safety science, near misses are described as occurrences with potentially important safety-related effects that are prevented from developing into actual consequences (van der Schaaf, 1992). In the health care context, near misses are viewed as occurrences that had the potential to become an adverse event but through chance, prevention, or mitigation did not result in harm (Aspden et al., 2004; Battles & Lilford, 2003; Kaplan & Rabin Fastman, 2003). A clinician’s ability to monitor for potential threats and errors underpins the process of prevention and mitigation (Aspden et al., 2004; Espin, Levinson, et al., 2006; Henneman & Gawlinski, 2004; Jeffs et al., 2009; van der Schaaf, 1992). This monitoring function, sometimes referred to as vigilance, is an integral part of upholding safe practices on a daily basis (Ramanujam &
Goodman, 2003). Although an initial conceptualization of near misses in health care exists, our understanding of how clinicians respond to near misses in daily practice remains poorly understood.

5.2 Current Perspectives on Near Misses

Our understanding of how near misses are responded to draws mainly from safety science. The Eindhoven Model of Incident Causation (see Figure 1) used in this domain posits that near misses occur when a human operator detects and corrects a risky situation and averts harm or injury (van der Schaaf, 1992). The recovery usually depends upon the flexibility, experience, and intuition of the human operator to intercept an undesired chain of events and to prevent major harm (van der Schaaf, 1992). This work has been applied to health care in a case study which reported limited use of the model (Henneman & Gawlinski, 2004). However, evolving empirical work related to planned and unplanned recovery processes has expanded our understanding of how clinicians respond to near misses (Kanse et al., 2006).

This theoretical extension is based on Kanse et al.’s (2006) study that explored error recovery in a hospital’s pharmacy department using a Recovery Process Model (see Figure 2). In their model, Kanse et al. explain that recovery is planned when the operator activates barriers and defenses by following protocol or procedure to avoid negative outcome. Recovery of an error can also be unplanned when the operator engages in ad hoc, creative problem-solving strategies. Most of the 31 near-miss incidents reviewed in Kanse et al.’s study involved detection followed by countermeasures, and the researchers reported that organizational procedures, training, knowledge, and experience of clinicians played an integral part in error recovery. Though not explicitly using the Recovery Process Model, other studies shed light on recovery processes associated with detecting safety threats. For example, in a recent study involving a sample of 502
registered nurse participants, 350 nurses reported catching their own errors and 43 reported
intercepting a colleague in the process of an error (Rogers et al., 2008).

Incident causation and recovery process models focus on recovery at the operator level,
whereby individuals detect and mitigate errors and deviations. While the focus on cognitive
processes enacted at the human-operator level is an important contribution to our
understanding of near misses in safety science, researchers call for a more comprehensive view
of safety as a dynamic system property that moves beyond the individual human operator
(Hollnagel, 2004; Leveson, 2004; Reason, 2004). Such a perspective has particular relevance
for health care as it takes into account the microsystems and social nature of the work
environment where clinicians provide care to patients. Work in this area includes the system
migrations model that seeks to explain the interacting factors that foster near misses and errors
(Amalberti, 2001; Amalberti et al., 2006; Cook & Rasmussen, 2005). Within this model,
frontline workers operate within an envelope of possible actions influenced by wider
organizational and social forces (Cook & Rasmussen, 2005). Working in dynamic systems,
human operators adapt to and manage their work constraints by creating margins of acceptable
and unacceptable performance (Amalberti, 2001). Adaptive processes by workers include
deviations from existing standards of practice or protocols that can gradually lead to accidents
and errors. This transgression of practices is initiated with a migration from a safe space of
action to the unacceptable performance boundary. Events or situations that migrate to this
space, defined as borderline tolerated conditions of use (BTCU)—which include near misses
and violations in daily practice—are still within the safety margin (Amalberti et al., 2006;
Cook & Rasmussen, 2005). Table 5 provides definitions of types of deviations. (See also
Figure 4 for an illustration of the System Migration Model.)
Table 5

*Types of Deviations in System Migration Models*

<table>
<thead>
<tr>
<th>Type of deviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>Borderline tolerated conditions</td>
<td>Events or situations that migrate between the unacceptable performance boundary and safety margin.</td>
</tr>
<tr>
<td>of use</td>
<td></td>
</tr>
<tr>
<td>Violations</td>
<td>Events or situations that are deliberate deviations from safe operating procedures, standards or rules provided by the social context.</td>
</tr>
<tr>
<td>Near misses</td>
<td>Events or situations that have the potential for harm but do not proceed to migrate across the acceptable performance boundary.</td>
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In the systems migration model, near-miss situations deemed to be in the unsafe zone are recalibrated and brought back to the safety margin before producing a negative outcome (Cook & Rasmussen, 2005). Violations are defined as deliberate deviations from accepted standards of practice. They emerge as by-products of managing competing priorities (Amalberti et al., 2006). Within health care systems, attempts to provide safe patient care while simultaneously completing tasks in a timely fashion result in competing intentions. Cook and Rasmussen (2005) refer to practitioners who “game” the health care system in order to manage their workloads. Amalberti et al. (2006) also posit that ongoing transgressions can become accepted, routine practices that are embedded into daily functioning. Thus, violations are in part a socially determined phenomenon relying on the complicit acceptance of the group or, in the case of health care, the wider clinical team (Amalberti et al., 2006).

In summary, the error recovery and system migration models offer insight into the mechanisms associated with recovering from an error and migrating between safe and unsafe performance at the human-operator level. However, transgressions in practice associated with
near misses and violations that become socially accepted routine practices are not fully understood and have a slender empirical base at the group or organizational level (Amalberti et al., 2006). Understanding the social aspect of how near misses are experienced in clinical practice is important, given the interactive nature of teams and individuals delivering health care within clinical microsystems (Espin, et al., 2006). Previous work has revealed a variation in stakeholders’ perspectives of patient safety accountabilities (Edmondson, 2002; Espin, Levinson, et al., 2006; Espin, Lingard, et al., 2006; Tregunno et al., 2004). Specifically, senior leadership is concerned about high-visibility (i.e., sentinel) events and other measures valued by the public; middle managers, service chiefs, and department chairs focus on the product-line quality perspective of safety; and individual clinicians concentrate on issues in their daily work routine (Amalberti et al., 2006). Given these disparate perspectives, the present study was undertaken to identify how health care professionals and administrators respond to near misses. One of the study’s primary objectives was to explore the perceptions associated with responding to near misses from different health care disciplines and stakeholder perspectives.

5.3 Method

This study used a constructivist grounded theory approach because it provides an interpretive understanding of how subjects construct their realities (Charmaz, 2000, 2006). This methodological approach was selected because a key aim of the study was to gain insight into how clinicians and administrators experienced and responded to near misses in daily clinical practice. The iterative process to determining emergent themes followed Charmaz’s (2006) analytical approach, which was described in more detail earlier in this study. Further analysis of the data set included comparing the emergent themes with the key concepts derived from safety science. The investigative team sought to explain the nature of experiencing and responding to
near misses from the multiple perspectives of clinicians and administrators in one health care organization.

5.4 Results

Participants indicated that near misses involve two different processes: (a) deviating from standards of practice and inadvertently creating a potentially harmful error, and (b) enacting vigilance to convert potentially harmful errors to near misses. Near misses manifested in clinical practice were either unintentional or intentional deviations from a standard or established care process. Study participants reported that in some cases the initiator of a potentially harmful error was aware of the deviation, while in other cases he or she was unaware. The majority of near misses cited by study participants involved a deviation from a known standard of practice, including those related to physicians (and to a much lesser extent, nurse practitioners) prescribing, dispensing, or administering medications and treatments.

According to participants, near misses caused by a deviation from standards of practice and/or organizational policy are normal parts of daily practice. Study participants further elaborated that the normalization of these types of near misses is mainly due to the complex nature of the care environment. Participants cited examples of clinicians who are interrupted or distracted by another colleague (thereby setting in motion a potentially adverse event) but who lack the expertise to recognize a near miss had occurred. As one administrator described, “I think care is so complex right now and [clinicians] forget the simple things.” In terms of expertise, one of the nurses noted: “I guess expertise and being around long enough to have enough patients to see [factors that influence near misses from occurring]. If you don’t see those patients enough, or if you don’t have enough of those patients, you can’t necessarily see the problems.”
Participants also attributed near misses to intentional breaches or departures from existing standards of care. This type of deviation sometimes involves lack of specification, whereby physicians knowingly did not specify the dose, frequency, or route of the medication or TPN. This sometimes took the form of physicians or residents checking off a standard amount on an order sheet, or issuing verbal orders to the nurse at bedside to give a bolus of a drug. While participants provided other examples of residents taking procedural shortcuts, a dietitian and 2 physicians also cited examples of senior, experienced physicians who did not follow standards of practice. An advanced-practice nurse described the lack of precision around prescription orders:

So instead we just substitute in, that’s where the dieticians come in—we just do it for them, [when] they are not ordering a standard solution, they don’t really know what to do. My experience is that [doctors and residents] take short cuts, they order standard concentrations and the precision with which they manage the care for infants who can be very labile and have very precise needs in terms of sodium intake for example, dextrose intake, are not managed effectively sometimes for those high risk children.

Some study participants point to the initiator of such a prescription or treatment error as the cause of the near miss, a practitioner who then relies on other clinicians to detect and correct the error. The research team developed the term “collective vigilance” to describe the process by which clinicians would pick-up on potentially harmful errors made by another clinician. Participants further differentiate collective vigilance as being either responsive or planned. (See Appendix I for an overview of the themes, dimensions, and definitions of vigilance.) Responsive vigilance refers to a process whereby a deviation in practice or potential threat is caught and then clarified and corrected. With responsive collective vigilance, the deviation is detected during the double-checking process by a clinician other than the originator of the potential threat. Most often, a more experienced clinician recognizes that something is wrong, such as a medication or treatment order does not make sense. In this latter case, the clinician would clarify the order by comparing it with guidelines or consulting the Compendium of Pharmaceutical and Specialties
and/or the ordering physician or nurse practitioner. Following the clarification step, the order would be corrected prior to administration to the patient. Responsive vigilance also includes those clinical situations wherein deviations are picked up and corrected at change of shift. Key examples of this type of vigilance are adjusting medications running through IV or TPN solutions; reinserting tubes or lines that have fallen or been pulled out; and disentangling tubes from children and babies.

Study participants also described the use of planned vigilance to monitor potential safety threats and deviations from standards of practice. Planned vigilance emerged as a process whereby clinicians proactively mitigate deviations in practice by watching over or consulting colleagues. For example, clinicians might anticipate potential prescription errors from certain doctors or when new residents arrive in their clinical area; in this case, they may discuss the matter with a knowledgeable colleague or point out to novice colleagues any potential safety threats. Similar to the triggers related to unintentional deviations, a perceived lack of expertise and knowledge also heightens awareness among more experienced clinical staff of potential errors. Participants also indicated that double-checking policies with regards to high-risk medications, parenteral solutions, and high-risk patients had been implemented at the organizational level. In one interview, a participant described how pharmacists were asked to enforce the organization’s prescription protocols set forth by the organization as a mitigating strategy to reduce drug errors caused by a physician-related breach of protocol.

Within both responsive and planned vigilance, watching for and recognizing near misses and potential threats reflect deeply entrenched values related to keeping patients safe. Being vigilant was described by many study participants as the accepted norm of practice and daily functioning. In this context, participants routinely picked-up other clinicians’ deviations by
enacting (a) their respective disciplinary standard of care by double-checking the order or (b) the instituted checklist for high-risk medications and TPN. Paradoxically, collective vigilance can erode safety. In many examples described, physicians (ranging from residents to senior staff) did not realize they had initiated a deviation until it was brought to their attention by another clinician, usually through a process of clarifying or challenging the order. Through this later interaction, the order was corrected with no further action on the part of the clinician who initiated the error. Some study participants view the reliance on others to vigilantly prevent and mitigate deviations as an inadvertent and potentially hazardous abdication of their role and responsibilities associated with prescribing. Study participants cited such examples of physicians who purposefully rely on others to check and correct errors made in their prescription orders. As noted by a physician taking part in the study, enacting collective vigilance may foster greater risk and decreased performance:

Near misses are very common and the hospital employs pharmacists to basically catch those and they generally do a very good job, or the system does a good job. I think that as part of the consequences of having competent, engaged 24/7 pharmacists in the building, but also within the ICU we have three pharmacists, it has de-skilled the physician prescribing practices, because the dose that is close enough will then be revised, by another health care professional. And so what I think it has done instead of adding a layer of defense, we’ve just decreased performance and increased reliability on another group of performers to detect, if you like, constructed near misses. So this is, I see this as a potentially dangerous thing that really requires making holes in order to facilitate speed and physicians doing other tasks, but I think it’s a potentially bad consequence.

The erosion of safety by way of collective vigilance also implicates novice nurses and residents. An experienced nurse observed that clinicians should point out near-miss events to newer colleagues (i.e., graduates), as they often focus intensely on the task at hand and perhaps are not familiar with the policies and procedures; as a result, they may not pick up the prescription errors made by residents. Although more experienced clinicians pick up and correct
many of the errors, there is a sense that more near misses are going unnoticed, as observed by a nurse as follows:

I think more things are not being picked up as they were before, to no fault of [the new nursing graduate]; they do not know any better, [or] the resident who is writing it. Then pharmacy will pick it up, or somebody else. So they do usually get picked up; once in a while they don’t.

An emergent theme of the findings, then, is that enacting collective vigilance consequently results in an expectation that others will catch one’s errors. In turn, this expectation may lessen the individual practitioner’s sense of personal vigilance. Thus, decreased performance emerges as an unintended consequence of the trade-off between collective vigilance and violations.

5.5 Discussion

The majority of theoretical and empirical work on near misses focuses on the individual human-operator level. These studies conceptualize near misses as error recoveries (Kanse et al., 2006; van der Schaaf, 1992) and situate them as events migrating between safe and unsafe performance (Amalberti, 2001; Amalberti et al., 2006; Cook & Rasmussen, 2005). This study’s findings support the previous conceptualizations of near misses at the human-operator level as recovery and migratory processes.

Study findings also add to what we know about near misses as recovered errors in clinical practice and go beyond the previous emphasis on individual vigilance in health care (Tucker & Edmondson, 2003). Specifically, the concept of “collective vigilance” emerged as a distinct aspect of how near misses are recognized and responded to in certain clinical situations at the local level. These situations mainly involved expert clinicians who paid closer attention to certain physicians’ medication and treatment orders and watched over novice nurses and residents’ daily practices. By paying close attention, these clinicians would detect and convert
potentially harmful errors to near misses. Thus, near misses were not recovered by chance, but rather through experienced clinicians’ purposeful monitoring of other clinicians’ practices. Through vigilant monitoring, the expert clinician recognizes that something is wrong with the patient or care process and then relies on a clinical pathway or standard of care to correct the problem. This dimension of vigilance supports the concept of planned recovery, whereby potentially harmful errors are detected and mitigated by a human operator as a result of enacting standard operating procedures (Kanse et al., 2006), which in turn activates countermeasures to mitigate the potential harmful error (Henneman et al., 2006; Rogers et al., 2008).

The study’s idea of collective vigilance extends beyond the linear, sequential explanation of near misses put forward in the Recovery Process Model, and echoes animal-behaviour science that views collective vigilance as part of animals’ survival mechanisms. As Treves (2000) notes, animals may monitor their surroundings beyond their immediate vicinity (i.e., individual vigilance), or they may relax their individual vigilance in larger groups and await signals given by other wary animals who detect threats (i.e., collective vigilance). Similarly in this study, physicians rely on the pharmacists and dietitians to detect and correct prescription errors. In addition, collective vigilance is closely related to a social-psychology concept of “social loafing” (Karau & Williams, 1993), which is the tendency for some individuals to expend less effort when working collectively than when working individually (Latane, Williams, & Harkins, 1979). Social loafing results in decreased group performance and dissatisfaction with group members who fail to contribute (Schnake, 1991). Although some elements of social loafing emerged whereby clinicians would take shortcuts in care processes, they did not seem to be dissatisfied with group members. Clinicians who were relied upon to detect and correct errors described this
social interaction as a routine part of their daily practice, and in some cases they reported taking pride in their ability to detect and correct errors that might harm the patients.

While some clinicians may engage in potentially unsafe acts because they know that colleagues will pick up and correct such transgressions, our understanding of the interactions amongst those who serve as safety nets and those who engage in unsafe acts remains elusive. Recently, Kerr (2009) reported on embryologists who were concerned about deferring to others to check their work; moreover, these practitioners thought the double-checking process created more work, decreased their autonomy, and increased the potential for error. Kerr’s study identifies the tension between individual and collective approaches to identifying and preventing errors that can inadvertently create conditions for errors. However, in this study clinicians purposively relied on other clinicians as safety nets. This difference may stem from the more variable nature of acute-care hospital settings.

Collective vigilance thus can prevent harm and erode safety. The safety-net function assumed by experienced clinicians who recover and prevent potentially harmful errors inadvertently encourages some clinicians to take shortcuts. This trade-off between collective vigilance and violations produces an unintended consequence of decreased performance for the physician who relies on a dietitian to ensure precise TPN orders, or the novice nurse who relies on clinical support to resolve complex patient care issues. In many cases, the initiator of the error was unaware of making an error or did not view the act as having any consequence. Ultimately, responding to near misses is a dynamic social phenomenon experienced differently by clinicians who detect and correct deviations and errors but, paradoxically, also propagate these same types of transgressions in future clinical practice.
Previous researchers have identified that vigilance in detecting errors may have unintended consequences (Amalberti et al., 2006), but this study is the first to elucidate how such interactions amongst clinicians can erode performance in an acute-care hospital. Reliance on other clinicians to detect and correct near misses can become an accepted daily practice. Such social routines progressively mask the larger safety threats of continued unsafe prescription practices and knowledge deficits of inexperienced clinicians. In this context, near misses are at the edges of safety margins in daily practice, fluctuating between safe and unsafe performance.

5.6 Limitations

This study’s principal limitation is that all data were collected from one academic acute-care hospital setting and do not necessarily reflect the general population in other health care settings. The majority of the interviews were conducted from June to September, when there is an influx of new learners (i.e., new graduate nurses and residents), and consequently there may be an overemphasis on the teaching/learning and expertise factors that were described by study participants as contributing to the ability of clinicians to detect and identify near misses in their organization.

5.7 Conclusion

This chapter illustrates that clinicians’ response to near misses involves a number of interacting processes. According to study participants, the processes include (a) deviating from standards of practice and inadvertently creating a potentially harmful error, and (b) enacting vigilance to convert potentially harmful errors to near misses. Study findings support previous studies that conceptualize near misses as recovery (Kanse et al., 2006; van der Schaaf, 1992) and migratory processes (Amalberti, 2001; Amalberti et al., 2006; Cook & Rasmussen, 2005). Beyond individual migration, this study shows that collective vigilance potentially creates risk by
eroding professional accountability through reliance on others to function as a safety net. The trade-offs between collective vigilance and violations have the unintended consequence of decreasing performance. Further inquiry is required to explore this outcome of the interplay between collective vigilance and violations.
CHAPTER 6: LEARNING FROM NEAR MISSES BEYOND A QUICK FIX:

EASIER SAID THAN DONE

This chapter discusses the ambiguous nature of learning and not learning from near misses. This extends the information presented in chapter 5 regarding the unintended consequence of the trade-offs between violations and vigilance in response to near misses in clinical practice. The methods section highlights the relevance of the approach selected for the study to address the key aim of gaining insight into multiple perspectives of clinicians and administrator as they learn (or not) from near misses in their daily practice. Not learning from near misses is manifested in practice by the individual clinician who “does a quick fix” or reports near misses that then “go into the black hole” with no learning taking place. In some cases, reported near misses result in corrective actions that “close off the swiss-cheese holes.” Underlying triggers for the three approaches are also described, and the chapter provides a brief overview of practical implications and further inquiry. Implications for practice and research are discussed in chapter 7.

6.1 Introduction

There has been a growing interest among health care organizations to improve performance as a result of lessons learned from near misses. Previous studies suggest that due to their frequency, near misses afford more learning opportunities than do adverse events and errors (Aspden et al., 2004; Barach & Small, 2000; Barnard, 2006; Coyle, 2005; Ginsburg et al., 2009; Grant & Larsen, 2007; Henneman et al., 2006). In addition, accreditation standards now require health care organizations to include near misses in their reporting systems (Accreditation Canada, 2008; Institute for Healthcare Improvement, 2009). Although many have called for health care settings to become learning organizations, research efforts related to learning from
patient safety events has been limited to analyses of failures and adverse events (Chuang et al., 2007; Ginsburg et al., 2009; Tucker & Edmondson, 2003; Tucker et al., 2002) or to the reporting of near misses (Chaudhry et al., 2003; Evans et al., 2006; Hohenhaus, 2008; Milch et al., 2006; Richardson, 2006; Uribe et al., 2002).

Empirical work has revealed that most near misses are corrected soon after they are detected by the individual clinician, with no further action taken to address the underlying causes of the near misses (Henneman et al., 2006; Henneman & Gawlinski, 2004; Richardson, 2006; Tucker & Edmondson, 2003). In these cases, near misses are viewed as unimportant, with no perceived benefits associated with reporting or taking further action (Chaudhry et al., 2003; Kaldjian et al, 2008; Leape, 2002). In other cases, near misses are entirely unnoticed by clinicians and do not surface as learning opportunities (Hurwitz & Sheikh, 2009). Despite the view of near misses affording greater sources for learning than do adverse events, clearly there are missed or unrealized learning opportunities in health care organizations. Understanding what contributes to these missed learning opportunities may provide insight into how organizations can develop capabilities and learning strategies that address and mitigate the underlying causes of near misses. Further, this insight may address the lack of attention to wider social and interpersonal influences on patient safety and health care improvement (Vincent, 2009).

Understanding how organizations learn from near misses in daily practice includes exploration of who instigates, perpetuates, and corrects the near misses, and how the near miss is responded to in the organization beyond the actions taken by the individuals involved. This chapter elucidates the nature and contributing factors of learning and not learning from near misses from a qualitative study involving clinicians and administrators in one health care organization. Key questions that guide this inquiry are: (a) What are the learning processes
associated with near misses? And (b) What are the factors influencing or impeding learning from near misses in health care?

6.2 What We Know About Organizational Learning and Safety

Our knowledge related to learning from near misses is derived from the management and safety science literature. The nature of organizational learning—or how organizations learn—has been described as a cyclical process whereby individuals scan, interpret, and take action to manage tasks and potential safety risks in their daily work environment (Daft & Weick, 1984). Argyris (1994) and Argyris and Schön (1978) argue that organizational learning from errors and failures involves a dual cycle of single- and double-loop learning. Single-loop learning describes situations whereby the individual identifies and corrects an error. Double-loop learning occurs when an organization changes underlying conditions that contributed to the error. This type of learning includes taking action to remove recurring problems that contribute to the organization’s ability to improve performance (Argyris, 1994; Argyris & Schön, 1978; Daft & Weick, 1984; Fiol & Lyles, 1985). The original work on organizational learning (Argyris, 1994; Argyris & Schön, 1978) was extended to health care by Tucker and Edmondson, who introduced their Model of First- and Second-Order Problem Solving and who also observed and interviewed nurses in nine hospitals (Tucker & Edmondson, 2002, 2003).

Tucker and Edmondson (2003) suggest that most nurses deal with problems using first-order problem solving techniques. In these “quick fix” scenarios, nurses identify and fix the problem at hand without taking further action to prevent recurrence. If attempts at solving the problem are not successful, nurses most often ask a nursing colleague for help and connect with other clinicians as a last resort. Second-order problem solving most commonly takes the form of reporting the problem to management and occurred in only 7% of the observations. The
predominant “quick fix” approach to correcting failures that has emerged in empirical work
mainly corresponds to the individual human-operator level rather than broader organizational
responses. Key factors that precluded second-order problem solving included (a) unit efficiency
constraints that evoked nurses to rely on heuristics to remedy the error in a timely fashion, and
(b) an emphasis on individual vigilance in health care (Tucker & Edmondson, 2003). The
identification of organizational factors that influence or impede learning from near misses is
another gap in our knowledge. Prior work suggests that conditions which increase the likelihood
of errors may be different than those that foster catching, correcting, and learning from errors
(Edmondson, 1996). However, this has not been explored empirically.

Tucker and Edmondson’s (2003) results are limited to nurses. Because health care
requires a high level of interdependence among processes, clinicians, and support services
(Glouberman & Mintzberg, 2001; Paterick, Paterick, Waterhouse, & Paterick, 2009), a view of
learning that addresses such interdependence would be helpful. Further exploration of how
individuals construct meaning through their interactions with others and through processes in
their daily work environments is called for (Antonacopoulou & Chiva, 2007; Baum & Dahlin,
2007; Brown & Duguid, 1991; Easterby-Smith et al., 2000; Gherardi et al., 1998; Lave &

This exploration includes viewing learning as a social process that includes paying
attention to schemas, which are embedded rules, routines, or mental models (Antonacopoulou &
Chiva, 2007). Emerging schemas define the boundaries of action and the way interactions can
influence or impede learning (Antonacopoulou & Chiva, 2007). For example, an individual’s
willingness to discuss his or her involvement in an error or near miss may be mediated by a fear
of being viewed as incompetent by others. This concept is referred to as psychological safety and
can propel or impede collective learning (Edmondson, 1999). However, the manner in which social interactions influence or impede learning from near misses remains poorly understood.

In summary, further exploration of the nature of and factors contributing to organizational learning from near misses is called for. This exploration may provide greater insight into how organizations can develop learning strategies that address the underlying systemic causes of near misses.

6.3 Method

A constructivist grounded theory approach guided this study’s exploration of how organizations learn from near misses because it provides an interpretive understanding of how subjects construct their realities (Charmaz, 2000, 2006). This methodological approach was selected because a key aim of the study was to gain insight into the multiple perspectives of clinicians and administrators as they learned (or not) from near misses in daily clinical practice. The iterative process to determining emergent themes followed Charmaz’s (2006) analytical approach, which was described in more detail earlier in this study. Further analysis of the data set included comparing the emergent themes with the key concepts derived from organizational learning. The investigative team sought to explain the nature of learning from near misses by exploring the factors that contribute to such learning.

6.4 Sample Description

The sample organization that was selected for the study was a large academic health sciences centre. Criteria for selection included a strong corporate commitment to patient safety initiatives and a reporting system that has the ability to capture near misses. In 2004, the study site had initiated a Web-based safety-reporting system that incorporated an anonymous reporting feature. Near misses are categorized as potential occurrences in the event-reporting classification
system. Near misses constituted 22.5% (788:3504) of reported safety events from January to October 2007 and 22.6% (862:3804) of events from January to October 2008 (Hospital X staff member, personal communication, December 11, 2009). Within this system, managers have access to reports in their clinical areas that can be used to identify trends and opportunities for improvement. Other key strategies to enhance reporting and learning from near misses that the study site implemented include: (a) a “good-catch” section in the hospital’s patient-safety quarterly newsletter; (b) reports in biweekly hospital newsletters; (c) education sessions for quality leaders and managers; and (d) hospital morbidity and mortality sessions.

6.5 Results

Participants interviewed in this study used three different approaches to correct and/or learn from near misses. The predominant action involves “doing a quick fix,” whereby clinicians correct near misses as soon as they are detected, with no attempts made to address the underlying causes of the near miss. The “quick fix” approach does not enable learning to be extended beyond the clinician to the unit or organization levels. The second most common approach is described as “going into the black hole,” where clinicians report near misses but receive no feedback. The third approach involves “closing off the swiss-cheese holes,” a process in which feedback is received and/or a change is made to policy and practice. Each of these approaches and their associated triggers are described in more detail below.

6.5.1 Doing a Quick Fix

Most of the study participants’ examples of corrective action to address near misses involved clinicians who corrected or fixed the near miss as soon as it was detected. The quick fix is initiated by the clinician who recognizes that something is amiss and who then acts upon the error; for instance, by clarifying a medication or nutrition order with another colleague.
Participants described several examples where pharmacy would pick up and immediately correct a prescription order and not report it in the safety reporting system. As a result of such unreported quick-fix situations, learning remains local and confined to the individual level (notably, learning is limited to the individual who initiates the fix, as opposed to the individual who initiates the error). This is noted in the following excerpt from a technician: “Did [the near miss] go to corporate level? No it didn’t, it was strictly a local level.” Interestingly, study participants did not acknowledge quick fixes as a source of or an impediment to learning. Rather, these quick fixes to near misses were described as “routine occurrences in daily practice.”

6.5.2 Going Into the Black Hole

Although not as common as doing a quick fix, a second approach involves reporting near misses but not hearing back from management; study participants refer to this lack of follow-up or feedback as “going into a black hole” or into the “black box.” The absence of feedback from reported near misses is perceived as a major barrier for learning and deters clinicians from reporting further near misses. One administrator describes clinicians as “feeders of information,” as they are not included in the formal review of the incident at the corporate level. A subset of this approach includes examples of clinicians who reported the near misses but who were not involved in the review process. With this approach, the perception of the frontline clinicians is that action related to the near miss event remains at the local level.

6.5.3 Closing off the Swiss-Cheese Holes

Many study participants perceived near misses as valuable learning opportunities and offered suggestions to enhance organizational learning from near misses. This ranged from increasing awareness of near misses as important safety events that should be detected and
reported, to more diligent follow-up from reported near misses. As one advanced-practice nurse describes,

If we can identify [near misses], then we can anticipate some of the issues arising and then we can proactively start to strategize around how to minimize or eliminate those risks from our system. We have to close off the swiss-cheese holes.

Though “closing off the swiss-cheese holes” is the least frequent approach, receiving feedback from observed/reported near misses is its most common and valuable learning action. Feedback is provided mainly by individuals in clinical support roles (e.g., a clinical area quality leader or educator) and to a lesser extent by operational managers, with the exception of pharmacy. Other learning actions include escalating to management, reviewing through committees or at meetings, disseminating through communication channels (e.g., email alerts and newsletters), and embedding lessons learned into education strategies. Only a few examples were provided where clinicians and administrators perceived any change in organizational policy and practice; for instance, study participants described the development and implementation of safeguards (e.g., corporate policy on flagging children on heparin to avoid or minimize complications from invasive procedures) and a double-check policy (or checklists) as a result of near misses reporting.

### 6.5.4 Triggers for Approaches

Data suggest there are distinct triggers associated with the three approaches. (See Appendix J for an overview of triggers influencing action pathways; see also Figure 5 for an illustration of the three approaches and triggers.) The “doing a quick fix” approach was usually taken when the near miss was perceived to be a no-harm event; there were higher priorities than the near miss to manage in daily clinical practice; and fear and stigma was associated with near misses. (Each of these triggers is described in more detail in Appendix J.)
“Doing a quick fix” occurred most frequently when clinicians perceived that the error was fixed and there was no harm to the patient. Study participants referred to not feeling compelled to report near misses while managing other priorities to keep patients safe. Both the clinician and administrator cohorts described not having time to report near misses as they prioritized their daily work and provided care for complex and severely ill patients. A few participants believed quick fixes are part of their daily practice and took pride in their ability to use them; as a physician noted, “part of what we pride ourselves in is to be able to get ourselves out of tricky situations.” Another participant described how the pervasiveness of near misses further erodes learning opportunities: “If you had to report every near miss you were involved in on a daily basis, that is all that you would be doing.” The following excerpt by a manager delineates the priorities around reporting near misses within the current complex daily practice:

There’s still a focus on the complexity and the severity of the illness that they are dealing with and all the distractions and interactions that happen to occur; the last thing on their mind is reporting things that didn’t actually happen. You know they save whatever time they have for reporting things that actually harmed the patient.

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**Figure 5.** Action approaches and triggers.
Participants’ perceptions of quick fixes are also influenced by the view that despite organizational efforts aimed at patient safety, a safety culture does not yet exist. This mainly refers to the lack of direct feedback and clarity regarding what constitutes a near miss. Study participants also acknowledged that the stigma and fear associated with admitting involvement in an event that almost harmed a patient was another trigger for not reporting near misses.

Managing competing priorities also emerged as a trigger for the “going into the black hole” approach. However, the focus was on the administrator and management, rather than on the clinician. As one medical doctor noted:

If you don’t get feedback, you don’t learn anything. People get fed up bringing the issue to the attention of the manager or the unit director, and it’s the same issue; we had it in place, the same issue that has been going on for the last, you know, 5 years. So that is a huge thing if you don’t close the loop; if you don’t promote that awareness in your people, they are going to give up telling you.

Administrators offered an explanation for going into the black hole. For example, managers described having difficulty staying informed of the reported near misses amidst other priorities and they tended to focus instead on operational duties and on events that harmed patients. As noted by a quality manager:

There are certain areas that don’t utilize the data so people feel that they go into a black hole and nothing happens. Or they’ll have reported four or five times and nothing’s done. I think that some managers have trouble managing all the reports and then utilizing the data. They’re more focused on having enough staff, getting the patients out in a timely fashion, and they don’t have enough time.

Triggers for the third approach, “closing off the swiss-cheese holes,” included weighing the potential for severe harm with the ability to prevent similar near misses from occurring again. In this context, near misses that were associated with a greater potential for harm and that could be prevented in the future were more likely to be reported in order to influence subsequent corrective action. In the examples where learning was perceived to occur, leaders played a
pivotal role in encouraging near-miss reporting. Such individuals acted as a liaison between different areas in the hospital and engaged staff by providing feedback and making the improvements associated with the reported or observed near miss. The following excerpt from a Clinical Safety Manager’s observations illustrates the key role of leadership in influencing learning from near misses:

Getting them sort of engaged in making the improvements so that they see the connection; you know, I’m trying to make the connection for them into what happens and it’s the daily follow-up, daily feedback, hard-slogging kind of work and I think that is my predominant role right now.

In summary, three different approaches were taken by clinicians and administrators in their response to near misses. Interestingly, there was a variation in the approach individuals would take as they responded to near misses they experienced. For example, the same individual might report a near miss that was corrected before reaching the patient, but at other times would not report it. Another example is that the same type of near miss (e.g., a tenfold drug error) would be reported by one individual and not by another individual. This study finding points to the ambiguous nature of how near misses are responded to in health care.

6.6 Discussion

Several authors support the view that health care organizations can improve performance as a result of lessons learned from near misses (Aspden et al., 2004; Barach & Small, 2000; Barnard, 2006; Coyle, 2005). What remains less understood is what and how organizations are learning from near misses. Consequently, this study sought to discover how organizations are learning from near misses in health care. Action taken to correct and learn from near misses occurs in relation to three approaches. These approaches and their associated triggers support and extend previous views on learning and contributing factors. In this section, overviews of the key
contributions and implications of the study findings are compared and contrasted to theoretical and empirical work.

A key contribution of this study is identifying the inconsistencies of approaches that clinicians and administrators engage in when making sense of and responding to near misses. Within this landscape of varied approaches, the multiple priorities and interactions that clinicians face when providing care to patients influence whether or not learning occurs from near misses. Further variation occurs within and amongst individuals’ reported responses to similar near misses. Learning at the team or unit level and organization level occurs far less frequently than the “quick fix” correction of the near miss. This finding is consistent with other work that identifies the “quick fix” as the predominant way that learning occurs in organizations (Argyris, 1994; Argyris & Schön, 1978; Tucker & Edmondson, 2002, 2003).

All study participants reported valuing near misses as key learning sources. However, in the examples provided, analysis reveals that study participants did not view the quick fix approach as a source of learning. Rather, “doing a quick fix” was viewed as a part of clinicians’ daily work routine. To some study participants, the quick-fix near-miss events were perceived as unimportant or nonexistent. For others, there was a sense of taking pride in “doing a quick fix,” as it demonstrated competence. This finding is similar to how nurses described validation of competence associated with their ability to fix and correct problems (Tucker & Edmondson, 2003). Interestingly, study findings also showed that fear of being perceived as incompetent was a key reason why clinicians did not want to share near-miss events with colleagues or management. Regardless, the ambiguous nature of near misses and how they are associated with perceived competence and incompetence precludes learning. The fear of being viewed as incompetent and thus not reporting errors is consistent with how psychological safety can impede
organizational learning (Edmondson, 1999). In psychologically unsafe environments, people believe that if they make a mistake and/or ask for help, information, or feedback, others will penalize or think less of them.

Tucker and Edmondson (2003) and Edmondson (1999) argue that organizational learning is precluded by nurses’ focus on immediate problem solving and individual vigilance to emergent issues. The current study suggests that collective attention is required to enable learning to be extended beyond the clinician to the unit or organization levels. Collective attention must be present across the individual, unit, or clinical microsystem and organizational levels: (a) At the individual level, learning most often occurs when near misses are perceived to be potentially harmful and preventable; (b) at the unit or clinical microsystem level, the clinician who detects the near miss shares it with a colleague (manager or resource nurse) and is then encouraged by the colleague(s) to report it through the hospital-wide reporting system; (c) at the organizational level, management engages the clinicians who report near misses in the review process to determine further corrective action and makes changes to organizational policy and practice. However, organizational learning from near misses was rarely taking place. This study finding runs contrary to what many have described as a safety prerequisite—having a reporting and learning culture (Elder et al., 2008; Evans et al., 2006; Kaldjian et al., 2008; Reason, 1997).

Within the collective attention explanation, the majority of examples involved the individual and unit/clinical microsystem levels. In this scenario, clinicians felt safe and engaged in social interactions by sharing with colleagues or reporting to managers that a near miss had taken place. In turn, the colleagues (other clinician or resource nurse) or manager (clinical or risk) would make sense of the event with the clinician to facilitate learning. The roles that the clinical and quality managers and resource nurses have in this type of learning are consistent
with the concepts of boundary spanners (MacIntosh-Murray & Choo, 2005; Tushman & Scanlan, 1981) and information brokers (Wenger, 1998) in organizations. This is similar to what was found in a recent review of the literature related to middle managers who filter, frame, and enrich interpretations of events to enable organizational learning (Beck & Plowman, 2009). Moreover, leadership (Kagan & Barnoy, 2008; Morath & Leary, 2004; Vogus & Sutcliffe, 2007) and providing feedback (Elder et al., 2008; Evans et al., 2006; Kaldjian et al., 2008) are suggested mediating factors that influence learning.

However, often no further feedback was received from the organization around the reported near miss. The lack of feedback or “going into the black hole” is a contrary outcome to the communication structures and processes that the organization has put in place to enhance reporting and learning from near misses. For example, the reporting system is accessible to frontline managers who may run reports on the near misses occurring on their clinical units. Educational sessions are available to managers and quality leaders to enhance reporting and learning from near misses. Yet, managers report limited ability to focus on near misses amidst managing daily operational priorities. This finding supports the safety-science literature related to how competing priorities dictate what gets attention, or becomes salient, at both individual and organizational levels (Amalberti, 2001; Cook & Rasmussen, 2005), as well as theories of organizational attention (Weick & Sutcliffe, 2006). Clinicians report receiving minimal or no feedback from reported near misses. Clearly, a tension exists around the varying perspectives of how near misses get defined in the organization and which near misses are or are not reported and responded to. Recently, it has been posited that centralized organizational learning systems tend to reflect priorities of management and neglect those of clinicians to the detriment of substantial service improvements (Waring, 2009). Further work is required to understand how
organization definitions and competing priorities precludes learning across the individual, unit, or clinical microsystem and organizational levels.

In summary, a difference emerged between how scholars in safety science and organizational theory and management in health care have described learning from near misses and what is happening in daily clinical practice. With the exception of a few rare examples, “doing a quick fix” and learning at the clinical microsystem level through social interactions were the prominent approaches to responding to near misses experienced in daily practice. Study findings thus indicate that inconsistent attention to near misses by clinicians and administrators impedes organizational-level learning. This is similar to what has recently been suggested regarding teams that develop ritualistic and patterned responses to risk which privilege short-term reactive responses on the part of the individual, as opposed to more systematic learning within organizations (Kerr, 2009; Waring, 2009). By using near misses as the focal point, this study provides a description and explanation of why learning from near misses is not taking place at the organizational level, despite their posited value and frequency. More work is required to unpack the contrasting views of near misses as valuable and missed learning opportunities.

6.7 Limitations

A limitation of this study is that all of the collected data are derived from a single academic acute-care hospital setting. Thus, the learning pathways and associated triggers may not be transferable or relevant to other health care settings. This will require further study and validation.

6.8 Implications and Conclusion

Learning from near misses rarely occurs at the organizational level. In this study, there was some ambiguity on whether learning did or did not occur as a result of near misses. The
ambiguity is due in part to the variability in the approaches as clinicians and administrators respond to near misses in daily practice. The inconsistent attention to near misses in daily practice leads to limited and missed learning opportunities at the organizational level. This is an important theoretical contribution that addresses how individual, social, and organizational factors interact to influence learning. Study findings also have important implications for organizations in their efforts to enhance safety by learning from near misses. Key to these efforts is addressing the disconnect between the espoused view of near misses as learning opportunities at an organizational level and study findings that elucidated (a) doing a “quick fix” at an individual level or (b) “going into the black hole,” where no learning or localized learning is taking place. When addressing this disconnect, organizations will need to pay closer attention to the different interacting triggers and factors associated with enabling and impeding learning from near misses. Organizations need to create a culture and invest in structures and processes that enable time to report and learn from near miss events at the clinical microsystem level. This requires organizations to shift their management priorities on reporting safety events to ones that engage in the messiness that characterizes the everyday work of clinicians and involves the interplay between divergent understandings, ongoing tensions, and pervasive uncertainties (Kerr, 2009; Reason, 2004). It would be worthwhile to introduce response mechanisms that enable managers to respond to and proactively manage near misses that clinicians report—mechanisms, for instance, that may optimize the use of electronic reporting systems by including automated reports on near misses. Further exploration is required to determine the frequency of the automated reports provided to managers.

As this is the first study to explore organizational learning from near misses in health care, more empirical work is required. Further inquiry to reconcile the contrasting view of near
misses as valuable and missed learning opportunities should involve other health care organizations across the various sectors. This exploration may add further insight into areas to target for corrective action that address systemic underlying causes of near misses.
CHAPTER 7: IMPLICATIONS

7.1 Introduction

This qualitative study using a constructivist grounded theory approach sought to gain insight into the processes and factors associated with how near misses are recognized, recovered, and learned from in daily clinical practice in a health care setting. The research and semi-structured interview questions were designed to investigate learning from near misses as a social process and drew from the safety science and organization and management theory. Concepts were drawn from organization and management theory to address two limitations of safety science related to near misses. The first limitation is how individuals detect initial failures and determine whether or not they are near misses (this is not explained in safety science). The second limitation is inadequate consideration of the social aspects of detecting, responding to, and learning from near misses in safety sciences.

Collectively, the various analytical strands presented in the previous three chapters describe the processes associated with near misses as they are recognized, recovered, and learned from in daily practice from the perspectives of clinicians and administrators. Specifically, in chapter 4, I explain that the routine nature of near misses in daily practice often renders them unimportant, invisible, and in some cases inconsequential. In chapter 5, I discuss the trade-off between collective vigilance and violations in clinical practice that can inadvertently erode safety. In chapter 6, I discuss how learning is confined to the individual clinician and the finding that inconsistent attention to near misses by clinicians and administrators leads to limited and missed learning opportunities at the organizational level.

My study findings suggest that how near misses are recognized, recovered, responded to, and learned from is a dynamic, ambiguous, and social process that is highly contextual. These
findings contrast with the contemporary view that near misses are valuable sources for learning, quality improvement, and systems redesign (Aspden et al., 2004; Barach & Small, 2000; Carroll & Edmondson, 2002; Jeffs et al., 2008). This view is derived in part from the different nature of safety risks in healthcare. Other safety critical industries tend to have more linear and automated work flow processes compared with the more complex and nuanced nature of the health care system that relies on human interactions. Rather, my findings emphasize that inconsistent attention to near misses leads to limited or missed learning opportunities at the organizational level.

Clinicians and administrators are inconsistent in how they make sense of and respond to near misses. This inconsistency stems from the social nature of how near misses are recognized, responded to, and learned from. Further, the multiple priorities and interactions that clinicians face in providing care to patients influence whether or not learning occurs from near misses. Finally, variation occurs within and amongst individuals’ reported responses to similar near misses.

I use paradox as an orienting concept to further our understanding of how study findings contribute both theoretically (to safety science and organizational learning theory) and practically (to health system improvement), because theoretical tensions and opposing views may stimulate the development or refinement of a more encompassing theory (Eisenhardt, 2000; Lado, Boyd, Wright, & Kroll, 2006; Lewis, 2000; Poole & Van de Ven, 1989). Paradoxes are used to describe the existence of simultaneous and co-existing tensions embedded in complex traditions (Eisenhardt, 2000; Lewis, 2000; Lewis & Dehler, 2000; Poole & Van de Ven, 1989). These tensions can provoke insightful interconnections amongst the existing contradictions (Lewis, 2000). In this study, two important theoretical tensions emerged. The first was that despite the valuing of near misses, inconsistent attention to near misses leads to limited or missed organizational-level learning opportunities. This tension integrates the concepts that were
presented in chapters 4 and 6. The second tension that emerged was the vigilance and violations trade-off that was described in chapter 5. In this concluding chapter, I explore the theoretical contribution of these two tensions and their implications for organizational and clinical practice and research.

7.2 Inconsistent Attention to Near Misses Leads to Learning Opportunity Losses

The first tension corresponds to study participants who conceptualize near misses as a means to identify risks and as important events from which to learn from, while in reality, minimal learning occurs from near misses. The value in learning from near misses as a means to prevent future harm was reported; however, in many cases this view or belief was not reflected in study participants’ behaviors in practice, as many clinicians viewed near misses to be clinically unimportant and took no further action. This runs contrary to the view in safety science that near misses are perceived as risks to safety. This tension is evident in the following narrative by an Administrator:

I get the impression sometimes on the ward that sometimes they figure a near miss was a save and it’s not a problem so they don’t report it. I think it’s with the speed of the day—“oh, I just meant that wasn’t a problem, we fixed that on the run, I don’t need to report it” kind of deal; I think that’s what’s going on. I don’t think that they quite get sometimes if that happened on the run this time maybe there’s a reason—maybe the form is crummy, maybe the process is crummy, maybe we need to fix something.

One possible explanation of this finding comes from recent experimental work by Torelli and Kaikati (2009) that explores the value–behavior relationship. They note that in routine situations that involve managing multiple tasks, people may fail to focus on their values for interpreting actions and instead simply react to the situation at hand.

In this study, limited and missed learning opportunities occurred in two types of scenarios. The first scenario was at the detection phase, where “doing a quick fix” and moving
on to the next task were part of clinicians’ routine practice. There were also several examples where clinicians were not detecting near misses in practice altogether. The concept of “cognitive downgrading” emerged as an explanation for why events are (or are not) described as near misses, and why most are deemed inconsequential. However, the downgrading process was not straightforward; there were no specific patterns that emerged to explain why an occurrence may be downgraded to a near miss. Simply put, a near miss that is visible to some clinicians and evokes action beyond a quick fix may not be visible or consequential to others.

The second scenario occurred when no follow-up was provided from management on near misses that were reported, which was described by study participants as “going into the black hole.” In this scenario, tensions emerged between clinicians and administrators and both parties viewed near misses as important sources for learning that did not become consequential for daily practice. This study elucidated a paradox and inconsistency in the attention to near misses as learning opportunities, leading to limited or overlooked learning opportunities associated with near misses experienced in clinical practice.

Key triggers for changes in clinical practice or organization policy included an espoused organizational commitment to learning from near misses and a reporting system in place for near misses. The study site implemented other key strategies to enhance reporting and learning from near misses, including: (a) a “good-catch” section in the hospital’s patient-safety quarterly newsletter; (b) reports in biweekly hospital newsletters; (c) education sessions for quality leaders and managers; and (d) hospital morbidity and mortality sessions. However, despite having these strategies in place, minimal reporting and feedback was occurring. Recall that near misses constituted 22.5% (788:3504) of reported safety events from January to October 2007 and 22.6% (862:3804) from January to October 2008 (Hospital X staff member, personal communication,
The lack of reporting and feedback may also increase the likelihood that clinicians will act on near misses only to address immediate concerns while failing to take additional follow-up measures (study participants used phrases like “not feeling compelled” or it “is not a necessity to report near misses”). This view is noted by a doctor in the following excerpt:

If you don’t get feedback [on the near miss], you don’t learn anything. People get fed up, myself included, bringing the issue to the attention of the manager or the unit director and it’s the same issue that has been going on for the last, you know, 5 years. The assumption is nobody’s listening, therefore nobody cares, so why bother? So that is a huge thing if you don’t close the loop, if you don’t promote that awareness in your people, they are going to give up telling you.

How clinicians link competence (or incompetence) with the identification and reporting of near misses further demonstrates the complex nature of how clinicians and administrators ascribe meaning to near misses. On one hand, clinicians pride themselves on catching and correcting near misses in daily practice. On the other hand, clinicians fear being viewed as incompetent and held responsible for a near-miss event. Learning from near misses was further minimized by what study participants described as managing competing priorities in daily practice. The detecting and reporting of near misses competes with other tasks that clinicians needed to perform to keep patients safe. In the chaotic and complex work environment, clinicians focus on balancing the care processes or events that were deemed greater risks for harm. Care processes that were perceived to have greater risk for the patient were given priority over near misses that were quickly fixed and viewed as having no consequences. The downgrading of near misses amidst competing priorities is illustrated in the following narrative from a clinician:

We are inundated with initiatives and expectations and pressures such that something has to give and this has probably fallen off the priority list; people kind of go, “well you know what, we are going to manage the stuff that has some consequences first and then we will deal with near misses later.”
Another facet to this tension is the pervasiveness and routine nature of near misses, which renders them invisible and inconsequential and, moreover, impedes organizational learning. The frequency of near misses in daily practice makes it impractical for clinicians to report every near miss or for organizations to respond to every reported near miss. These findings have implications for organizations: How does one determine what near misses need to be reported and addressed at an organizational level, and which ones can be managed at the local level? This is further explored in section 7.4.

In summary, the emergent tension of the valuable—yet missed or limited —learning opportunities offers more insight into the complex and nuanced nature of near misses in health care. Implications for organizational and clinical practice and future research pathways are discussed in sections 7.4 and 7.5, respectively.

7.3 Vigilance and Violations Trade-Off Tension

The second key tension is the vigilance and violations\(^6\) trade-off. The linkage of vigilance and violations perpetuates deviations from safe practice. This unintended consequence was a by-product of deeply embedded socialized interactions amongst colleagues. In these situations, near misses were not recovered serendipitously, but rather through purposeful monitoring of other clinicians’ practices by experienced clinicians. Ironically, the practice of enacting this accountability for one another’s practices has the consequence of producing the expectation for some clinicians that others will catch their errors. Thus, reliance on collective vigilance lessens

\(^6\) The term violation encompasses the near misses described by study participants that involved deviation from a standard of practice by one clinician that was recovered and corrected by another clinician before harming the patient. The majority of examples of near misses described by study participants involved a deviation from a known standard of practice. These included the prescribing practices of physicians (and to a much lesser extent, nurse practitioners) and dispensing or administering medications and treatments. See chapter 5 for a more detailed discussion.
individual and personal vigilance. Although many of their errors would eventually get picked up and corrected by more experienced clinicians, there was a sense that more near misses were not being noticed by the novice practitioners due to their unfamiliarity with policies and procedures. Decreased performance emerged as a result of the trade-offs between collective vigilance and violations. For example, the following narrative illustrates a clinical scenario in which a resident assumed that the dietician would prepare a standard amount of total parenteral nutrition (TPN) but did not specify the need to include trace minerals:

[The resident] thought that the TPN pharmacy would put those in as standard amounts, [but] the pharmacy then actually delivers that as a zero sodium in the bag, even though there is no zero there. So that you know, to me you know that is a near miss, it also means that the next day you are playing catch-up; the baby might be hyponatremic, hypokalemic, you know, hadn’t got its trace minerals, because [the resident] had not ticked off the box for the trace minerals as well. To me those are near misses because they are underdelivering what they should be, but by underdelivering you also have morbidities associated with that.

The collective vigilance trade-off offers insight into what contributes to the occurrence of violations in clinical practice. Certain clinician groups take on the function of the safety net in daily routines, yet this practice contributes to unsafe margins of performance. Amalberti et al. (2006) and Vincent (2009) note that factors that contribute to violations are less understood. Further implications for organizational and clinical practice and research efforts are described in sections 7.4 and 7.5, respectively.

7.4 Implications for Organizational and Clinical Practice

The paradox lens helps to explain how clinicians and administrators view, make sense of, and respond to near misses in daily clinical practice. Study findings point to some uneasy dilemmas for organizations. The attempt to create a learning culture that includes near misses in the reporting system has unintended effects on daily practice. Even in an organization that has
made significant investments in safety, including an accessible Web-based reporting system and educational sessions for managers on how to enhance reporting and learning, it can be difficult to create effective local systems. Therefore, targeted strategies are required to address: (a) sense making and learning at the organizational level and (b) collective vigilance and learning at the clinical microsystem level.

7.4.1 Sense Making and Learning at the Organizational Level

At an organizational level, my findings point to two primary plans of action that will help make sense of and enhance learning from near misses: (a) determine the types of near misses that need to be reported and (b) shift the culture of “doing a quick fix” to one of learning from near misses in daily practice.

Determining what types of near misses need to be reported involves taking a critical look at organizations’ capacity to learn from reported near misses and other safety events. In this study, the capacity to learn from near misses was limited, as the majority of near misses were not documented by clinicians in the corporate reporting system. Yet, the majority of near misses that clinicians are faced with in their daily practice and do not report are risky events that have potential for future harm. Recently, Kerr (2009) called for reporting systems to capture risks that reflect the complexities of in situ work processes in which clinicians engage in their daily practice. As Reason (2004) suggests, error wisdom needs to be cultivated such that organizations are receptive to what clinicians view as risks in their daily practice. In this context, near misses are fodder for investigation and system performance. However, in this study they were experienced as noise in the background amidst other competing priorities and deemed inconsequential or not important. For example, near misses constituted less than 23% of the overall reported safety events in the study site. This finding conflicts with reports in the literature.
that state near misses occur 3 to 300 times more often than adverse events (Aspden et al., 2004; Barach & Small, 2000). According to Waring (2009), clinicians may only report events that fit within the predefined scales and typologies and may be discouraged from reporting events that are more ambiguous or complex (but that nonetheless have important safety implications). Many of the near misses that were described in this study were not being reported or learned from despite being examples of risks and vulnerabilities that clinicians face in their daily practice.

Knowing that near misses are less likely to be recognized or are minimized amidst competing priorities, leaders in health care settings need to enhance clinicians’ situational awareness that there is a potential for risk or harm to patients from similar near misses occurring in the future (Catchpole et al., 2007; Hollnagel, 1998; Kessels-Habraken, Van der Schaaf, De Jonge, Rutte, & Kerkvlie, 2009; Schwid & O’Donnell, 1992). Efforts need to focus on increasing awareness of the value of near misses as sources of learning. Recent work around priming values to influence behavioral intentions and actual behaviors (Torelli & Kaikati, 2009) offers one option to improve awareness and thus safety in health care. In their series of experimental designs, Torelli and Kaikati (2009) reported that the use of hypothetical scenarios promoting a more abstract way of thinking leads to stronger, more value-congruent behavior. Health care organizations need to develop a common understanding of the dynamic and ambiguous nature that near misses have in daily practice for clinicians and administrators. This common understanding of near misses in health care organizations includes the variety of ways clinicians detect, interpret, and respond to them; such an understanding can guide the way near misses are recorded in the organization’s reporting systems, assist in developing strategies to enhance clinicians’ ability to detect and respond to near misses, and improve how the organization learns from near misses. Some strategies to achieve these aims are discussed in more detail below.
Organizations also need to pay attention to the following four influencing factors: clinicians’ ability to detect near misses; how other clinicians view near misses; the routine nature of near misses; and the organization’s ability to create a learning culture. Clinicians need to know how to anticipate recurring variations and be proactive in mitigating potential and actual risks to patient safety (Cook & Rasmussen, 2005). For example, organizations can create visual cues that are tailored to the specific clinical environments, such as the example cited in chapter 6 wherein babies treated with heparin were flagged at the bedside as a result of a previously reported near miss. Visual cues and alerts can serve as reminders to clinicians, particularly novice practitioners, to keep their eyes open to detect near misses and safety threats in their complex, chaotic environments (Taylor-Adams et al., 2008). In addition, organizations need to equip clinicians to detect progressive drifts in practice rather than only reacting to errors or incidents (Amalberti et al., 2006). This work will require organizations to address both those who function as the safety net and those who rely on others to function as the safety net in daily practice. Key to these efforts is for both groups to understand that the safety-net practice may mask larger safety threats of continued unsafe prescription practices and knowledge deficits of inexperienced clinicians.

To contribute to patient safety and performance, organizations will have to be more active in their pursuit of reporting and learning from near misses. The commonly accepted “doing a quick fix” and “going into the black hole” approaches will have to be addressed. Maximizing organizational learning from near misses requires further attention to the varying perspectives of clinicians and managers on what constitutes a near miss in daily practice. Organizations also need to enhance their efforts in shifting the culture of “doing a quick fix” to learning from near misses in daily practice. Many clinicians who did report near misses at the
corporate level rarely received feedback, and enhancing organizational responses to near misses presents a major challenge; hospital systems cannot gather exhaustive and detailed knowledge about all clinical risks (Waring, 2009). Further, organizations need to gather and process information in ways that enable the most appropriate utilization of resources. Yet, by predetermining the clinical risks that are part of a reporting system versus those that are followed-up on, organizations might neglect important information beneficial to organizational learning. Thus, organizations are tasked with responding to and encouraging clinicians and administrators to report near misses and other safety risks that characterize the complex nature of everyday work (Iedema, 2009; Reason, 2004).

7.4.2 Collective Vigilance and Learning at the Clinical Microsystem Level

Two primary areas require attention to make sense of and enhance learning from near misses at the clinical microsystem level: (a) reconciling the benefits and risks of collective vigilance and (b) engaging in learning.

Collective vigilance has both benefits and unintended consequences that pose risks to patient safety. The primary benefit is that more experienced clinicians identify those clinicians that are prone to initiating errors that will need to be recovered. The risk is that over time the safety net function becomes routine and the professional accountability of those prone to initiate the error is eroded. This finding points to strategies that encourage clinicians who detect near misses and violations in practice to engage in dialogue with the clinician who initially deviated from practice creating an error. As Amalberti et al. (2006) suggest, the management of violations must begin with discussions at the clinical level on standards of safe practice and acceptable and unacceptable deviations from rules and standards. However, this may be quite challenging, as it will involve addressing entrenched professional identities that enable physicians to continue to
Physicians often do not perceive mistakes or any violations made in prescribing orders when they are recovered and cause no harm. Moreover, clinicians who serve as safety nets might also see catching and correcting errors as part of their practice and do not view the situation or event as an error or violation. This is important work for organizations to tackle, as the manner in which clinicians make sense of and give meaning to safety events is constructed within clinical practice, and their interactions with others reflect wider professional and cultural concerns (Waring, 2009).

Learning at the clinical microsystem level also occurred in a number of examples where feedback from risk managers and resource nurses made clinicians more aware of the risks associated with a near miss. Providing timely feedback signals to clinicians the importance of reporting and learning from near misses. However, this is not a frequent practice. Study participants often cited that there was not enough time to report, review, and provide feedback on the near misses that had occurred. Thus, organizations need to provide time for clinicians to report and for administrators to review and provide feedback on reported near misses. Organizations also need to create risk-manager and resource-nurse positions to carry out this work. Further learning from near misses can occur if organizations leverage existing structures or create new ones to communicate the potential for risk or harm to patients from a similar near miss occurring in the future. Local learning can facilitate the translation of experience into change and improvement (Waring, 2009; Wenger, 1998). Sharing knowledge through narratives enables staff to share information and develop collective meanings of near misses and risk (Waring, 2009). Near misses could be included on the agenda for clinical unit-specific morbidity and mortality or corporate-wide patient safety rounds. A key part of the discussion could focus
on how the near misses were detected, how they were responded to, and what potential harm or risks are associated with the near misses.

### 7.5 Future Research

The tensions and concepts presented in chapters 4 to 7 provide insights into how organizations are learning (or not) from near misses, and the study findings suggest a multifaceted research agenda. Further research is needed to delineate how near misses and other safety threats are recognized and recovered and learned from in daily practice in health care organizations. This line of inquiry will contribute to the larger call for multiple paradigms and eclectic methodological approaches to patient safety research that provide insight into the social and contextual nature of near misses and other safety threats (Vincent, 2009; Ovretveit, 2009). For example, study findings elucidate the need for more insight on how individual, social, and organizational factors influence learning from near misses and safety threats in daily practice. In addition to the formal safety measures and protocols, further inquiry into the unarticulated set of actions involved in day-to-day operations is required (Mesman, 2009). Consequently, the streams within research agenda should explore and examine (a) the variety of actions evoked in identifying and discerning near misses; (b) trade-offs and unintended performance consequences of the interplay between collective vigilance and violations; (c) the contrasting view of near misses as valuable and missed learning opportunities; and (d) the dynamics of a learning organization.

An important next step will be to determine if similar tensions and concepts exist in other health care settings. Future research should address whether learning from near misses, beyond “doing a quick fix,” is best suited at the organizational level, at the clinical microsystem level, or at both levels. This will also require further inquiry into the daily activities in which clinicians
engage and interact with others to keep patients safe. Recently, authors have called for research efforts to delineate how professionals solve problems and analyze the underlying causes of errors in daily practice to build resilience against future risk (Kerr, 2009; Mesman, 2009). This exploration may advance learning by further addressing the systemic, underlying causes of near misses.

From this descriptive work, strategies aimed at enhancing clinicians’ ability to detect, respond to, and learn from near misses and patient safety events can be developed and tested in practice. Prior to full-scale implementation and testing of the intervention, a pilot test of the selected measures and interventions is recommended. A mixture of qualitative and quantitative methods likely will need to progressively refine the design before embarking on a full-scale evaluation. It is anticipated that a quantitative design is needed to evaluate the effectiveness of the intervention, through either a time series analysis or randomized control trial. Attention to the local context is a critical source of evidence that informs the development and evaluation of interventions (Walshe, 2007), so a qualitative aspect will add to the intervention’s effectiveness and, at the end of the pilot, will help us to understand what are the success factors and lessons learned. Ultimately, such research could lead to multisite intervention studies aimed at enhancing clinicians’ ability to detect, respond to, and learn from near misses and other safety threats in health care.

7.6 Limitations

This study has several methodological limitations. First, we employed a snowball technique that yielded a convenience sample of health care professionals and administrators from a single academic health sciences centre. Two potential biases underpin this sampling approach: (a) Clinicians and administrators from other health care settings may have different perceptions
than those of our participants; and (b) clinicians and administrators who agreed to participate in this study were interested in the topic area, therefore sampling bias may have occurred. In addition, the majority of the interviews were conducted from June to September when there is an influx of new learners (new graduate nurses and residents), which possibly resulted in a greater emphasis by study participants on the teaching/learning and expertise factors related to near misses in their organization.

7.7 Summary

In conclusion, this study demonstrates that the process by which clinicians and administrators ascribe meaning to and learn from near misses in a health care setting is complex. The inconsistent valuing of near misses in daily practice and the nature of collective vigilance can undermine organizational-level learning. Interactions amongst individual, social, and organizational factors influence whether learning takes place or not. Several theoretical tensions advance what we know about the social interactions and dynamics of how organizations interpret and learn from near misses, two of which require further attention. First, there is a need to address the tension between the pervasiveness of near misses in everyday practice and the fact that many are undetected and constitute missed learning opportunities. The second key tension is the paradoxical nature of collective vigilance as both safety net and safety threat. Addressing these tensions is paramount. In order to harvest value from near misses to improve safety, they must first be recognized as near misses (Leape, 1994). As one clinician noted:

I think that [learning from near misses] is important because … if we can identify [near misses], then we can anticipate some of the issues arising and then we can proactively start to strategize around how to minimize or eliminate those risks from our system. We have to close off the swiss-cheese holes.
Several strategies can enhance the detection of, response to, and learning from near misses. At an organizational level, determining which near misses need to be reported and responded to at both corporate and unit levels, and shifting the culture from “doing a quick fix” to learning from near misses in daily practice are areas that require further attention. In addition, focused efforts are needed to reconcile the benefits and risks of collective vigilance in order to engage in learning at the clinical microsystem level.

Finally, this study points to the need to develop and test strategies aimed at enhancing clinicians’ ability to detect, respond to, and learn from near misses and patient safety events. Greater efforts are needed to emphasize that near miss events and collective vigilance can pose risks to patient safety. This represents a shift from a perception of near misses as quick fixes and safety nets without consequences, to a longer-term outlook that a similar near miss may result in harm in the future. This will require concerted attention on the daily activities and practices usually hidden from view that preserve and improve safety (Mesman, 2009) and those that lead to progressive drifts in performance (Amalberti et al., 2006; Kerr, 2009).
References


Appendix A

Overview of Patient Safety in Other Countries

World Health Organization’s World Alliance for Patient Safety

In October 2004, the World Health Organization (WHO) launched the World Alliance for Patient Safety (referred to the Alliance hereafter) in response to a World Health Assembly Resolution (2002). This resolution outlined the global growing concerns of patient safety in the health care system. The Alliance’s key mandate is to increase awareness and political commitment to improve patient safety globally. In 2005, the Alliance launched its work on Reporting and Learning for Patient Safety with its first Forward Programme and the WHO Guidelines for Adverse Event Reporting and Learning Systems. This document highlighted the importance of using near misses and adverse events as sources of learning and as a basis for future preventive action.

Other Countries Progress on Reporting and Learning from Patient Safety Events

In addition to the Alliance’s efforts, several efforts with a national scope have taken place. These include adverse event studies, legislation and systems to support reporting and learning from patient safety events. A key part of the global efforts to address patient safety in the health care system is the development of legislative and regulatory statutes and reporting systems at national levels. Some countries are ahead of Canada in terms of national legislation and reporting and learning systems including Australia, Denmark, England and Wales, and the United States. See next pages for an overview of the legislation and reporting systems associated with patient safety reporting and learning. Despite the development of national reporting systems very few countries’ jurisdictional reporting systems have been developed (Carroll-Solomon & Denny, 2005; Joshi et al., 2002). Other efforts to improve safety include national campaigns, however the focus has been mainly on clinical practice changes and not on reporting and learning from patient safety events. See later in this Appendix A for a description of the Institute of Healthcare Improvement’s Safer Healthcare Now Campaign.
Overview of National Adverse Event Studies

<table>
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<tr>
<th>Country</th>
<th>Adverse Event Description</th>
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<tr>
<td>United States</td>
<td>Brennan et al. (1991) reported population-based estimates of in-hospital adverse events. The design was a two-phase review of a random sample of 31,000 medical records at 28 hospitals in New York State in 1984. Included in the study were adult non-psychiatric patients. The first review was completed by registered nurses or medical records specialists who applied a standard screening form to assess the possibility of an adverse event. An adverse event was defined as “an injury that was caused by medical management (rather than the underlying disease) and that prolonged the hospitalization, produced a disability at the time of discharge, or both” (p.370). The second stage of review was completed by physicians (board-certified internists or surgeons). Using a standard review instrument, physicians assessed the medical records that met at least one of the screening criteria from stage one for evidence of adverse events and negligence (defined as “care that fell below the standard expected of physicians in their community”; the concept of negligence in this study reflects tort law and issues of medical malpractice). Included in this review were adverse events that occurred prior to the incident hospitalization, but were discovered in the incident hospitalization. Adverse events were found in 3.7% of all hospitalizations; 27.6% of these were assessed as occurring due to negligence (the overall rate of adverse events due to negligence was 1%). Adverse events associated with a surgical procedure were the most common (48% of all adverse events) (Leape et al., 1991). This category included bleeding, wound healing, injury during the operation, emboli, pneumonia and infections. Adverse events associated with surgical procedures were assessed as the least likely to be caused by negligence (17%). The next most common adverse event was medication related, of which 18% were assessed as being caused by negligence. Brennan and colleagues (1991) estimated that among the almost 2.8 million people discharged from New York hospitals in 1984, there were 98,609 adverse events, of which 27,179 involved negligence. Thomas et al. (2000) used a similar methodology to the Harvard Practice Study (Brennan et al., 1991) with a random sample of hospitalizations in 1992 (n=15,000) from a representative sample of Utah and Colorado hospitals were assessed for adverse events. Medical records underwent a similar two-stage review process. An adverse event and negligence were defined in the same way as the Harvard Medical Practice Study. Similar to the Harvard Study, adverse events that occurred prior to the incident hospitalization and were either: (a) the cause of the incident hospitalization, or (b) detected during the incident hospitalization, were included. Adverse events occurred in 3% of hospitalizations. Of the adverse events, 32.6% in Utah, and 27.5% in Colorado were assessed to be caused by negligence. Adverse events associated with a surgical procedure were the most common (45%); of these, 17% were assessed as being caused by negligence. Medication-related adverse events were the next most common (19%); 35% were assessed as being caused by negligence.</td>
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<td>Country</td>
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<td>Australia</td>
<td>Wilson et al. (1995) used the same study definition for adverse event as the US studies (Harvard Medical Practice and Utah and Colorado) for their study using hospitals from the states of New South Wales and South Australia. A similar two-stage process reviewed a random sample of 14,000 hospitalizations in 1992. Adverse event was defined in the same way as the two American studies. Reviewers did not attempt to assess negligence, but rather assessed preventability, which is associated with quality improvement rather than malpractice. A much higher rate of adverse events was found; 16.6% of hospitalizations had an adverse event associated with them. Fifty-one percent of these adverse events were assessed as preventable. A later reanalysis of the Australian data reduced the incidence of adverse events to 10.6%. (Thomas et al., 2000).</td>
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<td>United Kingdom</td>
<td>Vincent et al. (2001) reported the prevalence of adverse events among the sample was 10.8%, of which 48% were assessed as preventable. This study involved a random sample of medical records (n=1,014) from two London hospitals in 1999 and 2000. A similar two-stage review process from the Brennan et al. (1991) was used. Adverse events were defined as unintended injuries caused by medical management rather than by disease processes. Adverse events were included if they occurred in the incident hospitalization, but could have been detected at a later time.</td>
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<td>Spain</td>
<td>Aranaz et al. (2005) conducted a retrospective cohort study with 24 hospitals (large, medium and small sizes) with patients who stayed more than 24 hours in hospital. The screening criteria were derived from the list of conditions used in the New York and Utah and Colorado studies. Incidence of patients with adverse events related to medical care was 9.3%; 42.8% of adverse events were considered as avoidable; and 17.7% accumulated more than one adverse event.</td>
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<td>Netherlands</td>
<td>Cuperus-Bosma, Wagner, &amp; van der Wal et al., (2006) employed the following methodology: a pilot in 2004 that included: a) retrospective epidemiological study in 22 hospitals of the nature, seriousness, the scope and costs of AEs during hospitalization and the attributable harm for patients, consisting of case record reviews similar to other studies; b) a prospective epidemiological study consisting of case record reviews and interviews with patients during ambulatory care in hospitals; and c) in the same hospitals a study of the extent to which AEs found with the case record reviews, can also be retrieved in the current reporting and complaint recording systems. The second project will involve a prospective epidemiological study of the causes of AEs and near accidents and the possibilities for prevention in a number of surgical departments and OR, emergency care units and internal medicine and will also look at to what extent to organizational, human, technical and patient-related nature play a role for the occurrence of AEs and near accidents.</td>
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<td>France</td>
<td>Michel et al. (2007), using the main outcome measure of adverse events in relations to number of days of hospitalization, reported the incidence density of adverse events was 6.6 per 1000 days of hospitalisation (95% CI 5.7 to 7.5), of which 35% were preventable. Invasive procedures were the source of half the adverse events, of which 20% were preventable. Adverse events related to the psychological sphere and pain was mostly considered as preventable. Ward staff found it difficult to assess the role of care management in the occurrence of adverse events: 41% of adverse events</td>
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were expected because of the disease itself, and could have occurred in the absence of the related medical management. The methodology used was a prospective assessment of adverse events by external senior nursing and doctor investigators with ward staff. A random three-stage stratified cluster sampling of stays or fractions of stay in a 7-day observation period for each ward was used.

| Denmark | Schiøler et al., (2001) conducted a pilot study on adverse events in Danish acute care hospitals. The sample was proportional with no over-sampling of high-risks groups. Chart reviews were done in 17 different acute care hospitals (1,097 acute care hospital admissions) from the Danish National Patient Register, reviewing between 20 and 204 admissions per hospital. Adverse events were identified using a three-step procedure: 1) Nurse screening by 18 criteria identifying high-risk groups. 2) Independent reviews by pairs of consultants. 3) In case of disagreement between second step consultants, two additional independent reviews was performed by new consultants (internist and surgeon) followed by conference. All chart reviews were performed independent of medical specialty. All nurses and doctors were senior and experienced clinicians. In 114 admissions 176 Adverse Events (AEs) were identified. The prevalence of admissions with adverse events was 9.0% of all admissions. Preventability of adverse events was found in 46 of admissions (40.4% of AEs). The adverse events caused on average a 7.0 days prolonged hospital stay. Most adverse events resulted in minor, transient disabilities. Permanent disability or death in relation to an adverse event was recorded in 30 admissions. |
## Legislation Associated with Patient Safety Reporting and Learning

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<th>Country</th>
<th>Legislation Associated with Patient Safety Reporting and Learning</th>
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<td>United States</td>
<td>In July 2005 the U.S. House and Senate passed the <em>Patient Safety and Quality Improvement Act</em> (Public Law 109-41). The four requirements outlined in this bill include: 1) create a national voluntary database of non-identifiable patient safety data to track trends and identify systems-based causes of medical errors resulting in minor injuries or near misses; 2) identify Patient Safety Organizations (PSOs) to collect and assess the confidential safety data obtained through voluntary mechanisms (the Agency for Healthcare Quality and Research was mandated this accountability); 3) make patient safety data privileged to prohibit it from being used against care providers in litigation or administrative proceedings; and 4) develop standards for communication of health information using information technology (Bleich, 2005; Fong, 2005). Events and close calls that undergo root cause analysis at health care organizations (e.g. Veteran’s Affairs) are afforded protections accorded to them under Title 38 United States Code (U.S.C.) 5705.</td>
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<td>Australia</td>
<td>In June 2001 the Advanced Incident Monitoring System (AIMS) was declared a quality assurance activity by the Federal Health Minister under Part VC of the <em>Health Insurance Act 1973</em> and was renewed in June 2006. The legislative protection provides for the following: 1) confidentiality of information that becomes known solely as a result of the quality assurance activity and 2) non-disclosure of the applicable information by those who participate in activities that involve the assessment or evaluation of the quality of health services provided by others. Recommendations arising from a quality assurance activity are determined to be in the public domain.</td>
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<td>Denmark</td>
<td>In June 2003 <em>The Act on Patient Safety in the Danish Health Care System</em>, was passed and came into effect in January 2004. This act is the regulatory foundation for the national reporting system and requires 1) clinicians to report adverse events; 2) regions (hospital owners) to analyze and act on the reports; and 3) reports provided to the National Board of Health (NBH) be anonymous. In turn the NBH communicates the learnings from regions throughout the country. Section 6 of the Act provides protections for individuals who report adverse events.</td>
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# National Patient Safety Event Reporting and Learning Systems

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<tr>
<td><strong>United States</strong></td>
<td>One of the Agency for Healthcare Quality and Research’s preliminary activities is the development of common definitions and reporting formats for the collection of the patient safety data. The terms and definitions, including a defined harm scale, will be publicly available in the summer of 2008. After collecting and analyzing sufficient non-identifiable data, AHRQ plans to publish information on national and regional statistics, including trends and patterns of patient safety events. This information will be published in AHRQ’s annual <em>National Healthcare Quality Report</em>. The Veterans Administration National Center for Patient Safety (VA NCPS) has two separate reporting systems. The internal reporting system, the Patient Safety Information System (PSIS), tracks close calls, adverse events and sentinel events. The PSIS is designed with a focus on the identification of systemic issues. The second reporting system, a third-party system modeled after the Aviation Safety Reporting System, is operated by the National Aeronautics and Space Administration (NASA) and is called the Patient Safety Reporting System (PSRS). The PSRS is voluntary, confidential and non-punitive. Human factor engineers coupled with the appropriate program staff review root cause analysis findings and patient safety reports to identify issues that may require broader notification and/or change throughout the Veterans Health Administration (VHA). The Joint Commission (JC) is the accreditation body for health care organizations in the United States. Accreditation requirements include that facilities are required to perform an in depth (root cause analysis) review following a serious care related event. In addition, reported events (between 400 and 500 sentinel events annually) are reviewed by expert analysts specializing who then work with member organizations to ensure that the reviews are thoroughly conducted. Completed reports contain de-identifiable data that is aggregated. Reported events and trends that potentially have broader implications for the healthcare system go through an advisory group. An Electronic Patient Safety Toolbox has been developed by the National Academy for State Health Policy (NASHP). The toolbox was created to provide regulators or policy-makers with common instruments that can be used throughout the development and implementation of new adverse event reporting systems, or the modification of existing systems (National Academy for State Health Policy, 2008). Some of the information provided includes tools for collection and analysis of data, as well as the interpretation of data, and appropriate distribution of feedback to maximize system safety improvements.</td>
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<td><strong>England &amp; Wales</strong></td>
<td>A national program to improve patient safety was initiated in 2000 following the release of <em>An Organization with a Memory</em> (Department of Health, 2000). This document drew public attention to the statistic that approximately one in 10 patients admitted to a National Health Service (NHS) hospital suffered unintentional harm.</td>
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The NHS subsequently established the National Patient Safety Agency (NPSA) that was mandated to develop a National Reporting and Learning System (NRLS) (House of Commons Committee of Public Accounts, 2006). The NPSA has refocused its efforts to use analyzed data to inform rapid patient safety learning, priority setting and coordinated activity across the NHS.

**Australia**

In January 2000, Australian Health Ministers unanimously supported the creation of the Australian Council for Safety and Quality in Health Care to address the concerns associated with harm to patients. Up until 2006, the Council led national efforts to promote systemic improvements in the safety and quality of health care in Australia with a particular focus on reducing likelihood and effects of error. State ministries have agreed to participate in the publishing of a national critical incident report that includes data related to eight adverse event types as collected by the Australian Institute of Health & Welfare. The Advanced Incident Monitoring System (AIMS) is the incident monitoring system used in 54 per cent of the Australian public healthcare system. Patient Safety International (PSI), a subsidiary of Australian Patient Safety Foundation (APSF), supports the risk management system which is purchased by states and adapted for local use. In January of 2006, the Council was disbanded and a fourth iteration was created. The resulting new Australian Commission on Safety and Quality in Healthcare is neither incorporated nor a legislated body. A National Minimum Data Set is to be developed (including a subset of adverse events from the state reporting systems). The information captured through AIMS is retained by the healthcare organizations as well as the applicable state and is not currently broadly shared on a national basis.

**Denmark**

Denmark has four separate reporting systems in place. These include: 1) no fault compensation program for healthcare-related injuries (not underlying disease process); 2) healthcare complaints system; 3) service and housekeeping complaints system; and 4) confidential reporting system for adverse events.

## Other Patient Safety Initiatives

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Institute of Health Improvement’s 100,000 Lives and 5 Million Lives Campaigns</strong></td>
<td>Over the last 5 years (2004 – 2009) the Institute of Healthcare Improvement (IHI) has spearheaded two national campaigns aimed at reducing morbidity and mortality associated with adverse events and errors in the United States’ health care system. The first campaign, entitled 100,000 Lives Campaign, ran from January 2005 through June 2006. This campaign focused on implementation of six evidence based interventions including: 1) Deploy Rapid Response Teams; 2) Deliver Reliable, Evidence-Based Care for Acute Myocardial Infarction; 3) Prevent Adverse Drug Events (ADEs) using Medication Reconciliation; 4) Prevent Central Line Infections; 5) Prevent Surgical Site Infections; and 6) Prevent Ventilator-Associated Pneumonia. Outcomes measures from this initial campaign include that over 3,100 hospitals participated with the following for each of the interventions: Rapid Response Teams: 60%; AMI Care Reliability: 77%; Medication Reconciliation: 73%; Surgical Site Infection Bundles: 72%; Ventilator Bundles: 67%; Central Venous Line Bundles: 65% with 42% of hospitals participating in all six interventions. (IHI, 2009). During the campaign timeframe, IHI estimates that 122,300 lives were saved (Institute of Health Improvement, 2009). In 2007 IHI launched the 5 Million Lives Campaign. This campaign builds on the original six interventions in the 100,000 Lives Campaign and added an additional six new interventions targeted at harm. These six new interventions include: 7) Prevent Harm from High-Alert Medications; 8) Reduce Surgical Complications; 9) Prevent Pressure Ulcers; 10) Reduce Methicillin-Resistant Staphylococcus Aureus (MRSA) infection; 11) Deliver Reliable, Evidence-Based Care for Congestive Heart Failure; and 12) Get Boards on Board. As of May 2008 there were 3,800 facilities enrolled (IHI, 2009).</td>
</tr>
</tbody>
</table>
Appendix B

Reporting and Learning From Patient Safety Events: Canadian Efforts

Reporting and learning from patient safety events has also become a national priority for Canada. Since the release of the Canada Adverse Event Study (CAES) by Baker et al. (2004) several efforts to enhance reporting and learning have been undertaken. Key efforts include changes to legislation and accreditation standards that govern health care organizations and regulated health care professionals. In addition, national efforts include the creation of a national institute and safer healthcare campaign.

Canadian Adverse Event Study

A key driving force to improve patient safety in Canada was the release of the Canadian Adverse Events Study (CAES). Using a similar methodology as the Harvard Medical Practice Study, Baker et al. (2004) determined the rate of in-hospital adverse events in five Canadian provinces (British Columbia, Alberta, Ontario, Quebec and Nova Scotia). Medical records were randomly selected at each hospital (n=3,745). Inclusion criteria were those over 18 years of age whose stay in hospital during the 2000 calendar year was at least 24 hours. A two-stage review process was conducted, with nurses or health records professionals conducting the first stage, and physicians conducting the second stage. Preventability was assessed by physicians using a 6-point scale. This study indicated that 7.5% of hospital patients experience an adverse event and that 36.9% of these adverse events were preventable (Baker et al., 2004). This finding is consistent with other reports that have estimated that half of the 3 – 10% of hospital admissions that result in some form of injury to patients are preventable (Brennan et al., 1991; Leape et al., 1991; Thomas et al., 2000; Vincent, Neale & Woloshynowych, 2001). The most common types of adverse events were associated with surgical procedures (34%), followed by medication or fluid-related events (24%).

Canadian Legislation and Systems Associated with Reporting and Learning from Patient Safety Events

Canada, federal legislation exists for reporting mechanisms for adverse reactions related to drugs (Adverse Drug Reaction Reporting) and incidents involving medical devices (Medical Device Incident Reporting). Reports for both systems must contain a detailed explanation of the incident and a summary of the actions taken as a result of the manufacturer’s investigation. Appendix B provides a more detailed description of these reporting systems. In addition, three provinces (Saskatchewan, Manitoba and Quebec) have developed statutory adverse event reporting mechanisms (Canadian Patient Safety Institute, 2008). Each of these provinces defines reportable adverse events with slightly differently, but they all include serious adverse events that lead to the actual or potential loss of life, limb or function. Interestingly, reporting near misses is not included in the statutes. The statutes make reporting mandatory in order to promote patient
safety, but place restrictions on reporting, such as reporting only de-identified information to
government in order to protect personal privacy and to encourage health professionals to comply
with reporting requirements. Health care organizations within these three provinces are required
to report events and follow-up investigations to their respective Ministers. Appendix B provides
an overview of legislation in each of these provinces.

Currently, no national adverse event reporting and learning system for all aspects of healthcare
services exists in Canada. Efforts are underway to develop the Canadian Medication Incident
Reporting and Prevention System (CMIRPS). This is a collaborative effort between Health
Canada, Institute of Safe Medication Practices (ISMP) and the Canadian Institute of Health
Information (CIHI). The overall goal of CMIRPS is to function as a system that manages the
risks inherent in medication use and moves toward a goal of risk prevention (Graham, 2007).
The CMIRPS brings together under one umbrella the Individual Practitioner Reporting system
(already established and operated by ISMP Canada); the Hospital Based Reporting (HBR)
system (to be established by CIHI); and the Individual Practitioner Reporting (IPR) system. In
addition, this collaborative has developed a draft Medication Incident Analysis and Learning
Framework that provides a comprehensive approach to data collection, data analysis, solutions
development, dissemination of solutions and knowledge translation. In fall 2008, a national pilot
of the CIHI reporting system was undertaken and findings will inform a national implementation
strategy in partnership with jurisdictions.

Health care organizations across all sectors are accountable and responsible for tracking the
occurrence of adverse events related to the services they provide (Canadian Patient Safety
Institute, 2008). While there are some provinces that have not yet started to coordinate the
learning derived from reported adverse events, others have. For example, Nova Scotia and
British Columbia have made significant investments to implement a provincial electronic
reporting and learning systems. However, a survey of health regions and other healthcare
delivery organizations conducted in 2007 revealed varying policies and incomplete
implementation of systems to collect, analyze, and learn from adverse events (Baker et al.,
2007). This nationwide survey also reported that the lack of standard definitions or common
classification systems is limiting the sharing and learning of reported safety events between
organizations (Baker et al., 2007).
## Adverse Drug Reaction and Medical Device Incident Reporting

<table>
<thead>
<tr>
<th>Reporting System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adverse Drug Reaction Reporting</strong></td>
<td>Health Canada, through the Canada Vigilance Program, is responsible for collecting and assessing adverse reaction (also known as side effects) reports for the following health products marketed in Canada: prescription, non-prescription, biologics (including fractionated blood products as well as therapeutic and diagnostic vaccines), natural health products and radiopharmaceuticals (Health Canada, 2008a). Healthcare professionals are encouraged to report suspected reactions by telephone or by submitting a form online or by fax. The monitoring program is especially interested in receiving notification when the: adverse reaction is unexpected, regardless of the severity (not consistent with product information or labelling); adverse reaction is serious, whether expected or not; adverse reaction is related to recently marketed health products (on the market for less than five years). The Canadian Adverse Drug Reaction Monitoring Program Online Query and Data Extract can be accessed from the Health Canada Drugs and Health Products website. This data provides the public with information concerning suspected adverse reactions associated with marketed health products.</td>
</tr>
<tr>
<td><strong>Medical Device Incident Reporting</strong></td>
<td>The Medical Devices Program oversees the safety, effectiveness and quality of medical devices in Canada by a combination of pre market review, post-approval surveillance and quality systems in the manufacturing process (Health Canada, 2008b). The three directorates involved in the program are the Therapeutic Products Directorate (TPD), the Marketed Health Products Directorate (MHPD) and the Health Products and Food Branch Inspectorate (HPFBI). Prior to being given market authorization, a manufacturer must present substantive scientific evidence of a product’s safety, efficacy and quality as required by the <em>Food and Drugs Act and Regulations</em>. The HPFBI is working to create a web-based tool to facilitate the posting of compliance and enforcement actions on a publicly accessible website as well as the posting of information on problem reports (Health Canada, 2008b).</td>
</tr>
</tbody>
</table>
Provincial Legislation Related to Reporting and Learning from Patient Safety Events

<table>
<thead>
<tr>
<th>Province</th>
<th>Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saskatchewan</td>
<td>Saskatchewan has developed detailed guidelines which outline the process (Saskatchewan Health, 2004). All notices and reports associated with a critical incident review process must be on a no-names basis (section 10 of the <em>Critical Incident Regulations</em>).</td>
</tr>
<tr>
<td>Manitoba</td>
<td>Manitoba through The <em>Regional Health Authorities Act</em>, subsection 53.2(1)) (An Act Respecting Health Services and Social Services, section 235.1) require that institutions themselves establish written procedures respecting the recording and providing of information about adverse events. The critical incident review committee must limit the contents of any notices, reports or information disclosed or shared to the minimum amount of personal information that is necessary (section 53.7 of The <em>Regional Health Authorities Act</em>).</td>
</tr>
<tr>
<td>Quebec</td>
<td>Quebec requires that information be reported in a “non-nominative” form (section 233.1 of An Act Respecting Health Services and Social Services). Quebec has a provision that would require the Minister to create a register of incidents for the purpose of monitoring and preventing such occurrence and ensuring control measures are implemented (section 431(6.2) An Act Respecting Health Services and Social Services). However, this provision is not yet in force.</td>
</tr>
</tbody>
</table>

Accreditation Canada Patient Safety Required Organizational Practices Associated with Reporting and Learning from Patient Safety Events

<table>
<thead>
<tr>
<th>Required Organizational Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish a reporting system for sentinel events, adverse events, and near misses, including appropriate follow-up. The reporting system is in compliance with any applicable legislation, and within any protection afforded by legislation.</td>
</tr>
<tr>
<td>Provide the governing body with quarterly reports on client safety, including recommendations arising out of adverse incident investigation and follow-up, and improvements made.</td>
</tr>
<tr>
<td>Implement a formal and open policy and process of disclosure of adverse events to clients and families, including support mechanisms for clients, family, staff and service providers involved in adverse events.</td>
</tr>
<tr>
<td>Establish a reporting system for sentinel events, adverse events, and near misses, including appropriate follow-up. The reporting system is in compliance with any applicable legislation, and within any protection afforded by legislation.</td>
</tr>
</tbody>
</table>

Source: Accreditation Canada.
### Patient Safety Area: Culture

<table>
<thead>
<tr>
<th>Goal</th>
<th>Create a culture of safety within the organization</th>
</tr>
</thead>
</table>
| ROPs | • Client/Patient Safety as a written strategic priority/goal  
      • Quarterly reports to Board on client/patient safety  
      • Reporting system for actual and potential adverse events  
      • Policy and process of disclosures of adverse events  
      • One prospective analysis per year |

### Patient Safety Area: Communication

<table>
<thead>
<tr>
<th>Goal</th>
<th>Improve the effectiveness and coordination of communication among care/service providers and with the recipients of care/service across the continuum</th>
</tr>
</thead>
</table>
| ROPs | • Inform and educate patients/clients about their role in patient safety (written and verbal communication)  
      • Employ effective mechanism for transfer of information at interface points  
      • Implement verification processes and other checking systems for high-risk care/service activities  
      • Reconcile the patient’s/client’s medications upon admission to the organization and with the involvement of the patient/client  
      • Reconcile medications with the patient/client’s medications to the next provider of service |

### Patient Safety Area: Medication Use

<table>
<thead>
<tr>
<th>Goal</th>
<th>Ensure the safe use of high risk medications</th>
</tr>
</thead>
</table>
| ROPs | • Remove concentrated electrolytes (including, but not limited to, potassium chloride, potassium, sodium chloride >0.9% from patient/client care units  
      • Standardize and limit the number of drug concentrations available in the organization |

<table>
<thead>
<tr>
<th>Goal</th>
<th>Ensure the safe administration of parenteral medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROPs</td>
<td>• Provide ongoing, effective training for service providers and users on all infusion pumps.</td>
</tr>
</tbody>
</table>
Patient Safety Area: Worklife/Workforce

<table>
<thead>
<tr>
<th>Goal</th>
<th>Create a worklife and physical environment that supports the safe delivery of care/service</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROPs</td>
<td>• Deliver at least annual education/training on client/patient safety to all staff</td>
</tr>
<tr>
<td></td>
<td>• Develop and implement a plan and process to assess client/patient safety issues within the organization and carry out improvements</td>
</tr>
<tr>
<td></td>
<td>• Delineate clearly the roles, responsibilities and accountabilities of staff and other providers for patient/client care and safety</td>
</tr>
<tr>
<td></td>
<td>• Implement an effective preventative maintenance program for all medical devices, equipment, and technology</td>
</tr>
</tbody>
</table>

Patient Safety Area: Infection Control

<table>
<thead>
<tr>
<th>Goal</th>
<th>Reduce the risk of health service organization-acquired infections, and their impact across the continuum of care/service</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROPs</td>
<td>• Adhere to federal/provincial infection control guidelines</td>
</tr>
<tr>
<td></td>
<td>• Deliver education and training for staff, other providers and volunteers on hand washing/hygiene</td>
</tr>
<tr>
<td></td>
<td>• Monitor infection rates, and share this information throughout the organization</td>
</tr>
<tr>
<td></td>
<td>• Examine, and where indicated, improve processes for sterilization of equipment and facilities</td>
</tr>
</tbody>
</table>

Safer Health Care Now Campaign

Similar to Institute of Healthcare Improvement’s efforts (see Appendix A), a national campaign that aimed to reduce preventable complications and deaths in Canadian hospitals was developed. The overall goal of the national Safer Health Care Now campaign is to improve the safety of patient care in Canada through learning, sharing and implementing interventions that are known to reduce avoidable adverse events (Safer Health Care Now, 2009). Since 2005 this campaign has evolved to include the following ten targeted interventions: 1) Deploy Rapid Response Teams; 2) Deliver Reliable, Evidence-Based Care for Acute Myocardial Infarction; 3) Prevent Adverse Drug Events (ADEs) using Medication Reconciliation; 4) Prevent Central Line Infections; 5) Prevent Surgical Site Infections; 6) Prevent Ventilator-Associated Pneumonia. 7) Prevent Harm from High-Alert Medications; 8) Reduce Surgical Complications; 9) Reduce Methicillin-Resistant Staphylococcus aureus (MRSA) infection; 10) Implement Venous Thromboembolism (VTE) Protocols for General Surgery and Hip Fracture. To date there are over 220 health care settings with 830 teams that are currently implementing one or more of six targeted leading practice interventions to improve patient safety. Interim results show that the
implementation of the six healthcare interventions can reduce injuries or deaths related to preventable adverse events. (Safer Healthcare Now, 2009).

**Canadian Patient Safety Institute**

In 2003, the Canadian Patient Safety Institute (CPSI) was established and funded by Health Canada as an independent not-for-profit corporation. Working collaboratively with health professionals and organizations, regulatory bodies and governments, CPSI’s mandate is to develop, implement and evaluate a pan-national strategy on patient safety. Specific activities associated with reporting and learning from patient safety events included the release of the Canadian Adverse Event Reporting and Learning System Consultation Paper in June 2008. In this document near miss events are referred to as 'close calls' defined as adverse events that did not reach the patient because of timely intervention or good fortune. Although the consultation phase is still occurring, the aim of the Canadian Adverse Event Reporting and Learning System is to enable the sharing of information and implementation of change related to safety and quality improvement within a pan-Canadian system (Canadian Patient Safety Institute, 2008).

Another relevant document that CPSI produced was The Safety Competencies Framework: Enhancing Patient Safety across the Health Professions (Frank & Brien, 2008). This framework was developed in collaboration with the Royal College of Physicians and Surgeons of Canada and content experts in education. Within this framework six core competency domains and aligned knowledge, skills, and attitudes were identified as integral for health care professionals to possess to provide safe care. The core competency domain most relevant to the exploration of organizational learning from near misses is the Recognizing, Responding, and Reporting Adverse Events.
# Appendix C

## Survey of Near-Miss Definitions

<table>
<thead>
<tr>
<th>Source</th>
<th>Definition</th>
</tr>
</thead>
</table>
| Ginsburg et al. (2009) | Minor Near Miss: An event that would have resulted in no harm or minimal temporary harm to the patient but did not because it was caught or because of good luck.  
Major Near Miss: An event that would have resulted in death or serious physical or psychological injury but did not because it was caught or because of good luck. |
| National Patient Safety Foundation (n.d.) | A situation in which an event or omission, or sequence of events or omissions arising during clinical care fails to develop further, whether or not as a result of compensating action, thus preventing injury to patient. |
| Henneman & Gawlinski (2004); Henneman et al. (2006) | A result of when the recovery process is effective and an adverse event is averted. |
| Cook & Rasmussen (2005) | Within system migration models, a situation or event that migrates to the safety net margin but does not proceed to cross the acceptable performance boundary. |
| Aspden et al. (2004) | An act of commission or omission that could have harmed the patient, but did not cause harm as a result of chance, prevention, or mitigation. |
| Tamuz et al. (2004) | A non-event, good catch, accident waiting to happen, or intervention by pharmacists. |
| Battles & Lilford (2003) | Event(s) in which the unintended consequences were prevented because there was a recovery by identification and correction of the failure, either planned or unplanned. |
| Kaplan & Fastman (2003) | An act of commission or omission that could have harmed the patient but was prevented from completion through a planned or unplanned recovery. |
| Nashef (2003) | A three-level classification for adverse events:  
- Type 1: system detects and corrects event; no harm done;  
- Type 2: one (or more) of the systems fails to detect and correct; no harm done;  
- Type 3: one (or more) of the systems fails to detect and correct; harm is sustained but falls short of the worst possible outcome (the marker or indicator outcome). |
<table>
<thead>
<tr>
<th>Source</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baker &amp; Norton (2002)</td>
<td>An event that could have resulted in an accident, injury, or illness, but did not either by chance or through timely intervention.</td>
</tr>
<tr>
<td>Kaushal &amp; Bates (2002)</td>
<td>Potential ADEs (adverse drug events) defined as medication errors that had a significant chance of causing harm to a patient. Intercepted potential ADEs were caught by the system before they reached the patient, while non-intercepted potential ADEs were those that reached the patient but fortuitously did not result in injury.</td>
</tr>
<tr>
<td>Murphy &amp; Charlett (2002)</td>
<td>Near miss maternal mortality is defined as women requiring transfer to an intensive care unit.</td>
</tr>
<tr>
<td>Battles &amp; Shea (2001)</td>
<td>An event in which the unwanted consequences were prevented because there was a recovery by identification and correction of failure. As defined by van der Schaaf, an event in which the unwanted consequences were prevented because there was a recovery by identification and correction of the failure, either planned or unplanned.</td>
</tr>
<tr>
<td>Barach &amp; Small (2000)</td>
<td>Any event that could have had adverse consequences but did not and was indistinguishable from full-fledged adverse events in all but outcome.</td>
</tr>
<tr>
<td>Orser, Chen, &amp; Yee (2000)</td>
<td>An event that did not involve the actual administration of a drug.</td>
</tr>
<tr>
<td>Ferraco &amp; Spath (2000)</td>
<td>Actions that did not result in patient’s deaths or serious physical or psychological injury, but which, under different conditions or with additional failures, could have caused such an outcome.</td>
</tr>
<tr>
<td>Veteran’s Affairs National Centre for Patient Safety (2000)</td>
<td>An event or situation that could have resulted in an accident, injury or illness, but did not, either by chance or through timely intervention.</td>
</tr>
<tr>
<td>Ibojie &amp; Urbaniak (2000)</td>
<td>Any error that, if undetected, could result in wrong blood group determination or in the issue of an incorrect or inappropriate component, but which was recognized before transfusion occurred.</td>
</tr>
<tr>
<td>Wu (2000)</td>
<td>Medication errors that did not result in adverse events.</td>
</tr>
<tr>
<td>Gurwitz et al. (2003)</td>
<td>Errors that had the capacity to cause injury but failed to do so, either by chance or because they were intercepted.</td>
</tr>
<tr>
<td>van der Schaaf (1992)</td>
<td>Occurrences with potentially safety related effects that were prevented from developing into actual consequences.</td>
</tr>
</tbody>
</table>
Appendix D

Sampling Strategy

Description

To address the potential sensitivity of the research topic area, a sampling strategy has been developed to ensure methodological rigour and an ethical approach. The purpose of the study is to gain an understanding of how health care organizations respond to near miss occurrences. This understanding will lead to the development of theory around organizational learning from near miss occurrences. It is important to note that the purpose of the study is not to ascertain whether each of the near miss exemplars that are brought forward occurred in practice, but instead to study participants’ perceived meanings and experiences associated with what happens in the organization after near misses occur. The focus of this study is articulated in both the information sheet (Appendix G) and informed consent (Appendix H) for potential study participants.

This document is supplementary to the research protocol and provides more in-depth details of the sampling strategy. It includes a narrative description and an illustration (see Figure 1) of the series of steps in the sampling strategy (document analysis and interviews/focus group study participants) and the corresponding information sheet (Appendix G) and informed consent form (Appendix H) for study participants.

Sequencing of Sampling, Data Collection and Analysis

Step 1: Contact with Medical Director of Patient Safety and Director, Quality and Risk Management

As an initial step, the doctoral student (referred to in text as the investigator) will contact the Medical Director of Patient Safety and Director, Quality and Risk Management to set up a meeting. At this meeting, the investigator will provide an overview of the study including the overall purpose and sampling strategy. A request for relevant documents including, but not limited to depending on what the Directors provide, Annual Reports from 2001 – 2006; Hospital x’s Blueprint for Safety and related ongoing accountability/monitoring reports; and exemplars and/or aggregate reports (stripped of identifiers) of ‘potential occurrences’ identified by the corporate safety reports and event reviews. The review of the documents will serve three

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7 Documents that contain information around patient safety and when available near misses or potential occurrences (Hospital x classifies near misses as potential occurrences in the safety reporting system).
purposes for this study, to provide: 1) historical and contextual data on the organization’s response to patient safety; 2) near miss exemplars that will ensure the questions included in the interview guide are site specific and contextually relevant and that study recruits individuals from areas where near misses have been reported; and 3) an additional data source for triangulation and verification to enhance data analysis rigor. Written consent will not be obtained for this part of the study, rather the sharing of documents will be a proxy for consent. An information sheet (see Appendix F in this document) that explains the overall purpose of the study and the sampling strategy will be provided to the directors.

**Step 2: Document Analysis**

The investigator will review and conduct an initial review (textual analysis) of the documents that are provided from Step 1 (Charmaz, 2006; Neuman, 1994; Spradley 1979). Specifically, the investigator will look for the plans and corresponding actions that Hospital x has put in place to address patient safety and near misses and specific examples of near misses (classified as potential occurrences in the Hospital X Safety and Reporting) to gain an understanding of the local context. The investigator may review the documents throughout the steps in the study as the study design involves a constant comparison, iterative approach.

**Step 3: Second Meeting with Directors to Identify Study Sample Participants**

Once the initial documents have been reviewed, the investigator will set up a second meeting with the Medical Director of Patient Safety and Director, Quality and Risk Management. At this meeting, they will be asked to provide an initial list of individuals at Hospital X who are perceived to be key informants that could speak to organizational learning from near miss occurrences. Given the study’s conceptualization of organizational learning as multi-level process that integrates individual, group/team and organizational learning, the doctoral student has selected a purposive sampling technique (Miles & Huberman, 1994; Patton, 2002) that will draw from three cohorts:

- **Corporate Leaders** (Chief Executive Officer, Chief Nurse Executive, Chief Medical Officer, Medical Director of Patient Safety and Director, Quality and Risk Management, representation from Program and Professional Practice Directors) who are responsible at the strategic direction level.
- **Clinical Managers** (mainly nurses) and department chiefs (physicians) in program areas who are responsible at the implementation and operational of clinical services level.
- **Clinicians** (nurses, doctors, pharmacists) responsible for the provision of clinical services for organizational learning from near miss occurrences.
Finally, the directors will also be informed that they may also be asked to consider participating
in the study given their expertise in safety and quality at Hospital x. A separate process for
recruitment of individuals to participate in the study (interview and/or focus group) has been
developed, including an information sheet and informed consent, described in Steps 4 and 5.
From this meeting, an initial list of potential individuals will be developed that will be used to
recruit potential study participants.

**Step 4: Pilot Testing of Interview Guide**

An interview guide (see Table A) has been developed as part of the semi-structured interview
process as a primary data collection tool. A pilot of the interview guide involving an individual
from each of the three cohort populations (senior management, middle management and
clinicians) will be conducted. Using the list obtained from Step 3, the investigator (in
collaboration with the thesis committee) will determine who these individuals will be (and a list
of alternates should the first individuals choose not to participate).

The following process will be used to recruit potential study participants. First, an initial email
with an information sheet around the study (see Appendix G) will be sent out to the three
individuals. Should the individual choose not to participate, the investigator will follow the
same recruitment process with the email and attached information sheet. Second, for those
individuals who indicate that they would participate, a meeting will be set-up where informed
consent (see Appendix H) will be obtained by the investigator prior to conducting the
interview. As outlined in the full protocol, after the 3 interviews are conducted using the guide,
the investigator and thesis committee will determine the relevance and appropriateness of the
questions in the interview guide. If no significant changes are recommended to the interview
guide, the three interviews will be included in the grounded theory analysis. If there are
significant changes, revisions will be made to the interview guide and the interviews will not
be part of the analysis. However, the individuals would be asked to participate in another
interview using the revised interview guide. These individuals will also be asked to identify
other potential individuals (perceived to be key informants in organizational learning from near
miss occurrences).
Table A: Interview Guide Semi-Structured Interviews

<table>
<thead>
<tr>
<th>Interview Question</th>
<th>Prompt Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell me about near misses that occur in practice at your organization?</td>
<td>Describe what near misses you have observed or heard about in practice?</td>
</tr>
<tr>
<td>Tell me about a near miss that lead to organizational learning?</td>
<td>What responses are there to near misses in the organization?</td>
</tr>
<tr>
<td></td>
<td>What ways does the organization respond to near misses?</td>
</tr>
<tr>
<td></td>
<td>What do you do?</td>
</tr>
<tr>
<td></td>
<td>What do you think contributes to your organization’s ability to respond to near miss occurrences?</td>
</tr>
<tr>
<td></td>
<td>From your experience, what has facilitated the response in your organization to deal with near miss occurrences?</td>
</tr>
<tr>
<td></td>
<td>From your experience, what has blocked your organization’s ability to deal with near miss occurrences?</td>
</tr>
<tr>
<td>Who else in the organization should be approached to participate in this study?</td>
<td>No prompts.</td>
</tr>
</tbody>
</table>

Step 5: Study Participant Recruitment and Data Collections: Interviews

Building on the initial list and pilot-testing of the interview guide, the investigator will continue to approach potential study participants with an email and information letter (Appendix G). The same recruitment process identified for the pilot interview guide in Step 4 will be used until theoretical saturation occurs. Within the study protocol, the investigator may interview the same individual several times which is articulated in both the information letter (Appendix G) and informed consent form (Appendix H). The final sample size will be contingent upon theoretical saturation where the point of repetition occurs where no new insights are gained for analysis (Charmaz, 2006).

Step 6: Study Participant Recruitment and Data Collection: Focus Group

Once theoretical saturation with study participants has been achieved and a theoretical model around organizational learning from near miss occurrences has been constructed, the investigator will conduct a focus group as a key verification strategy (Patton, 2002). As a final data collection point, the investigator will recruit 6 – 10 individuals who completed the interview to participate in a focus group to respond to the constructed theoretical model.8

8 This step was not included in this study as theoretical saturation was achieved with the sample of 25 interviews. A key verification strategy included an iterative constant comparison method involving a) different people; b) data
from the same individuals with themselves at different points in time; c) incident with incident; d) data with category; and e) category with other categories (Charmaz 2000; Charmaz, 1995; Glazier, 1978).
Ethical Considerations

Due to the sensitive nature of collecting data on near misses that are closely related to adverse events, anonymity and confidentiality of study participants will be emphasized in Steps 1 – 6 of the sampling strategy and data storage and access to data. Informed consent will be obtained by all study participants and will be kept separate from the transcription data in a locked, secure cabinet. Other measures to ensure confidentiality will include the following: a) development of an information sheet and consent form (Appendix G & H respectively for the semi-structured interviews) that outline the purpose of the study, expectations of study participants, ability to withdraw from the study at any point without consequence, risks and benefits will be developed as part of the ethics submission; b) all transcripts and related documents will be stored in a secure cabinet that only the doctoral student will have access to; c) the doctoral student will destroy the tapes immediately following transcription; d) names, personal identifiers, and attributable quotes will not be used in the thesis or future publications; and e) transcripts and data will be analyzed on the doctoral student’s personal computer which is password protected. As the informed consent for participation in the interview will ask participants to also check off in a box their willingness to participate in a follow-up focus group, a separate consent form is not required. Participation in the focus group will be the proxy as a voluntary consent to participate. Following ethical protocol, focus group participants will be instructed that the data collected will be aggregated to ensure confidentiality and that they are able to withdraw at any time from the focus group without any repercussions.

Should significant changes be made to the original interview guide (Table 1) or recruitment process the investigator will re-submit the revised interview guide to the Research Ethics Board at Hospital x prior to further participant recruitment and data collection.

References


### Appendix E

**Document Analysis**

<table>
<thead>
<tr>
<th>Document Details</th>
<th>Verbatim Words/Phrases/Sentences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code 1</td>
<td>Journal article</td>
</tr>
<tr>
<td></td>
<td>• In 2002 a comprehensive and action-oriented plan was released - ‘burning platform’ following two very tragic adverse events</td>
</tr>
<tr>
<td></td>
<td>• in May 2004, a comprehensive, on-line safety reporting system for all events was launched with the goals of increasing the number of reports, increasing the proportion of potential or near-miss reports, improving turn-around time for report follow-up and making improvements on patient safety</td>
</tr>
<tr>
<td></td>
<td>• September 2004, a system was implemented to manage and track hazard alerts and recall information</td>
</tr>
<tr>
<td></td>
<td>• need for integrating external and internal patient safety information, for identifying vulnerabilities and unsafe practices, and for making and evaluating appropriate change</td>
</tr>
<tr>
<td></td>
<td>• patient safety is included in the strategic plan, the annual goals and objectives, and in the operating plan and budget; as well patient safety should be addressed at the time of hire and be part of regular performance reviews</td>
</tr>
<tr>
<td></td>
<td>• database as been developed to facilitate tracking of feedback and actions</td>
</tr>
<tr>
<td></td>
<td>• critical occurrence reviews is the development of recommendations for improving the system and for preventing the recurrence of similar events</td>
</tr>
<tr>
<td></td>
<td>• by making an effort to learn from the mistakes of others we have the opportunity to improve care without the human toll associated with an actual event</td>
</tr>
<tr>
<td></td>
<td>• created an inventory of external data sources, which we routinely survey for relevant safety information – required a coordinated system for reviewing external information, evaluating its usefulness and ensuring the appropriate implementation of recognized safe practices</td>
</tr>
<tr>
<td></td>
<td>• emphasis on the reporting of potential incidents and close calls is also essential as it allows for learning without challenges associated with actual events</td>
</tr>
<tr>
<td></td>
<td>• a number of hospital-wide projects have been initiated as a result of safety reporting, including improvements to bed safety, entanglement and patient identification</td>
</tr>
<tr>
<td></td>
<td>• Internal - morbidity and mortality rounds, satisfaction surveys and other reviews and audits</td>
</tr>
<tr>
<td></td>
<td>• Patient safety learning opportunities include: key lessons in patient safety at orientation; regular news items in the hospital’s weekly newsletter; “branding” of the patient safety program; publication of a quarterly newsletter; monthly patient safety rounds; ad hoc area specific rounds and</td>
</tr>
</tbody>
</table>
meetings; patient safety web site and resources; quarterly meetings of area quality representatives featuring new hospital-wide initiatives and team successes and lessons learned

- With input from stakeholders throughout hospital x, an annual system-wide safety assessment is completed, which identifies a number of potential areas of focus
- Blueprint 10 Components: leadership and culture; management of critical occurrences; external surveillance; internal surveillance; policies, procedures and guidelines; staff education and partnerships; partnering with patients and families; program coordination; proactive risk assessment and audit; evaluation and research

<table>
<thead>
<tr>
<th>2</th>
<th>Journal article</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2</strong></td>
<td><strong>Patient Safety Committee mandate:</strong> 1) identify patient safety issues; 2) make recommendations to improve PS and 3) increase awareness and promote the partnership between families and staff in patient safety</td>
</tr>
<tr>
<td></td>
<td><strong>Overview of current and future initiatives – development of risk reporting system (critical care) and education of staff acknowledging our need and expectation for families to speak up about safety – integrate a safety talk into orientation of new staff, use our communication tools</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Host an annual patient safety symposium – initiated in June 2005</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Discussions between staff and families have allowed risk issues to surface and proactive strategies to begin</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Encourage families to identify safety issues in real time through “Safety Cards”</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Journal article</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3</strong></td>
<td><strong>Overview of trigger tool developed for patient population will have several applications, it will enable delineation of the incidence of adverse events in acute care hospitals across Canada and facilitate real time audit and database updates</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A key objective of this initiative is to create a tool that will generate data that can be viewed from both a national and local hospital perspective and to launch quality improvement activities to prevent AEs</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4</th>
<th>Annual report</th>
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<tbody>
<tr>
<td><strong>4</strong></td>
<td><strong>Playground injuries were significantly reduced after removed hazardous equipment</strong></td>
</tr>
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</table>
|5  | Annual report | • Mission ... Sharing our knowledge and expertise worldwide  
• Values ... Excellence – compassionate family-centred care and service that embraces diversity, in management and decision making, in promoting teamwork and encouraging leadership; and in safe and healthy environment  
• Hospital x national and international activities will lead to measurable outcomes that improve child health locally, provincially, nationally and internationally  
• Hospital x was rated higher than average in all patient satisfaction indicators and identified as a high-performing hospital in the acute and emergency department care editions of Hospital Report 2005  
• An organization affiliated with Hospital x launched a program of railway safety  
• Culture of innovation |
|6  | Annual report | • Ensuring efficiency, effectiveness and accountability throughout our operations  
• Organization of Hospital x was successful at government ban on an unsafe equipment |
|7  | Annual report | • Playground injuries were significantly reduced after removed hazardous equipment |
|8  | Annual report | • Timely access to the world’s best care  
• Knowledge organization  
• Hospital x had piloted a number of tools that will help ensure the best quality of care  
• Patients are treated more effectively and by the right professional. They will experience fewer complications and have fewer re-admissions  
• What we learn has important consequences for Canadian health as a whole  
• Research by population health sciences team showed that provinces that adopted mandatory legislation had significantly reduced head injuries |
|9  | Annual report | • An inquest into the death caused us the way care is provided, we have committed to a new, systematic approach to better and proactively avoid the same outcome from happening again |
|10 | Newsletter | • Medication history (links to near misses/recovery patterns discrepancies are brought to the attention of the prescriber and if appropriate, changes are made to the orders); tall man lettering (strategy to differentiate similar drug names)  
• Patient Safety Committee Activities provides TOR, challenges and strengths of committee. Updates on activities included – of particular relevance – explore ways for families to report safety incidents is a key activity to |
address issue of the need to increase family partnership in promoting patient safety

<table>
<thead>
<tr>
<th>11</th>
<th>Blueprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hospital x work to improve patient safety began with extensive review of the literature and a thorough assessment of internal and external best practices for dealing with human error</td>
<td></td>
</tr>
<tr>
<td>• Development of a fair and just culture</td>
<td></td>
</tr>
<tr>
<td>• Handle events with courage and honesty, and with a commitment to finding and improving system issues and to sharing these lessons with others</td>
<td></td>
</tr>
<tr>
<td>• Thankfully we do not have to experience tragic errors to learn and improve from them. By making an effort to learn from the mistakes of others we have the opportunity to achieve all of the gain without the pain</td>
<td></td>
</tr>
<tr>
<td>• Emphasis on the reporting of potential incidents and close calls is essential as it allows for learning without the human toll associated with actual events</td>
<td></td>
</tr>
<tr>
<td>• Iceberg diagram with near misses/close calls below the water line</td>
<td></td>
</tr>
<tr>
<td>• Create opportunities for staff to share their lessons and successes in improving patient safety</td>
<td></td>
</tr>
<tr>
<td>• A major objective of the plan is to ensure that we learn from and do not repeat the mistakes of our past nor the mistakes of others</td>
<td></td>
</tr>
<tr>
<td>• 10 essential components: Leadership, culture and communication; management of critical occurrences; external surveillance; internal surveillance; policies, procedures and guidelines; staff education and partnerships; partnering with patients and families; program coordination; proactive risk assessment and audit; evaluation and research</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12</th>
<th>Blueprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Patient safety included in the recent strategic plan as a core process and goals, objectives and operating plan for the 2003/04 planning year</td>
<td></td>
</tr>
<tr>
<td>• New – external best practice material has been collected, and a draft guideline document has been prepared for approval (patient safety walkarounds)</td>
<td></td>
</tr>
<tr>
<td>• Internal tracking process developed</td>
<td></td>
</tr>
<tr>
<td>• Sub-committee created ... obtaining and reviewing external safety information and alerts</td>
<td></td>
</tr>
<tr>
<td>• Patient safety material has been developed for orientation of all new staff and with more in-depth training being provided to the new clinical leaders and support staff</td>
<td></td>
</tr>
<tr>
<td>• Quarterly meetings of quality management committee leaders provide opportunities for staff to share their lessons and successes</td>
<td></td>
</tr>
<tr>
<td>• Patient safety plan has been shared in a number of external for a (MOHLTC and OHA)</td>
<td></td>
</tr>
<tr>
<td>• A process has been developed for quality and risk staff to review the minutes of all of these meetings to identify trends and initiatives</td>
<td></td>
</tr>
</tbody>
</table>
| 13 | Blueprint | • Blueprint received recognition from surveyors from the CCHSA as a national best practice  
• Patient safety has been included in the recent strategic plans and will receive top consideration as work to identify our new strategic directions; in the hospital’s annual operating plans and is a key priority in budget decisions  
• New – Leadership Safety Walkarounds  
• Hospital x was asked to provide expert testimony on our management of critical occurrences at a recent coroner’s inquest involving another facility  
• On-line safety reporting system has been in operation since May 2004 and has been accompanied by an increase in safety reports  
• Revisions to system based on feedback from the first year of operation is nearing completion  
• Patient safety program launched in September 2004  
• New – hazards and recalls database and notification system  
• First issue of quarterly patient safety newsletter in April 2005  
• Patient Safety symposium  
• Patient safety working group established  
• Physician Liaison, Patient safety role created  

| 14 | Blueprint | • Conceptual model for patient safety plan - emphasis on integrating external and internal patient safety information, on identifying vulnerabilities and unsafe practices, and on making and evaluating appropriate changes  
• Patient safety has been included in the recent strategic plan as a key component of the “operational excellence” strategic direction being developed over the next 3 years  
• Walkarounds have been underway since November 2004, based on a review of external best practice  
• New – conduct a patient safety culture survey  
• Committee restructuring has led to the dissolution of the Hazards Alerts Committee, assigned now to Biomedical Engineering and Quality and Risk Management departments with regular reports to the new Patient Safety Committee  
• Reviews of CCHSA’s 21 required organizational patient safety practices and NQF’s 30 safe practices  
• On-line reporting system has been in operation since May 2004 and has been accompanied by an increase of reporting by about 60%  
• Comprehensive revisions to the system were recently completed based on feedback form the first year of operation  
• New Patient Safety Committee is beginning to use safety reporting information to identify systemic issues for further investigation and follow-up  
• Working group has been recently struck to further increase the rate of
| 15 | Blueprint | • new logo  
• Key concepts listed: organizational learning (successful organizations pay particular attention to their processes for scanning their internal and external environments for useful information and for using this information to change practices in incremental and transformational ways; systems approach; just culture; complexity theory and complex adaptive systems; high reliability organizations; hindsight bias; human factors engineering; extreme honesty and humanistic risk management; communication; and model for improvement  
• Patient safety included in strategic plan “excellence ... in compassionate family-centred care and service that embraces diversity; in management and decision making; in promoting teamwork and encouraging leadership; and in a safe and healthy environment .... and annual operating plans  
• Survey completed in 2006, results received spring 2007 “staff feel safe in reporting mistakes”  
• Effective learning organizations diligently pursue an enhanced knowledge base through a network of external and internal scanning and feeder systems. When feedback shows a gap, particularly if it implies failure, these organizations respond with experimentation and development and incremental or transformational improvements  
• By making an effort to learn from mistakes of others, organizations have the opportunity to improve care without the human toll associated with actual events  
• External hazards alerts and recall system and internal safety reporting system  
• Management of critical occurrences processes and practices  
• Up-to-date and evidence-based procedures and guidelines provide clarity in situations where there is expert agreement about the appropriate course of action, and they provide useful learning tools for less experienced staff  
• Link with Human resources to ensure rewards and recognition for patient safety practices (e.g. “good catch” program) |
|---|---|---|
| 16 | Policy & | • self-evaluation and learning from experience are keys to improving health
<table>
<thead>
<tr>
<th>procedure</th>
<th>care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>critical occurrences will be managed, documented, and investigated promptly and consistently using a “systems” approach – an approach that focuses in identifying opportunities for improvement and changes to the healthcare system to prevent a recurrence of the event</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>17</th>
<th>Policy &amp; procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>reporting of actual of potential events is an important strategy for enhancing safety of patients, visitors, employees and volunteers.</td>
</tr>
<tr>
<td></td>
<td>Safety reporting provides an opportunity to identify and trend events and track their follow-up</td>
</tr>
<tr>
<td></td>
<td>Knowledge generated through this process allows us to learn from past experience so that system improvements can e made</td>
</tr>
<tr>
<td></td>
<td>A potential occurrence (near miss or close call) is any event or situation that could have reached a person but did not because of chance or timely interception. Example: wrong dose of medication ordered but not administered, wrong blood cross-match but blood not administered, incorrect sponge count but no sponge left in patient, uncapped needed found in linen but no resulting needlestick injury; puddle of water found on floor but no-one slipped, computer left unsecured with confidential information in view</td>
</tr>
<tr>
<td></td>
<td>Safety report will be completed by any staff as soon as possible following a actual or potential occurrences</td>
</tr>
</tbody>
</table>
• Reviewing internal reports and actively seeking vulnerabilities has allowed us to make important changes to improve patient safety at the hospital
• An essential underpinning of the Blueprint is the ongoing need to identify failures, examine their contributing factors, and apply new learnings to process of care improvement and system redesign with the goal of preventing recurrences
• Importance of reporting (organizational encouragement to report their errors and near misses) and learning (individuals’ and groups’ willingness and ability to understand and make changes based on the safety information that is provided through the system
• Internal and external surveillance – search for potential and existing vulnerabilities and failures, in order to put measures in place to avoid and mitigate against any harm
• On-line system allowed for the introduction of an eight level event severity code, including two levels of near miss events: 1) event did not reach anyone/potential minor harm; 2) event did not reach anyone/potential major harm; 3) event reached the person/minor or no harm resulted; 4) minor or no harm resulted/major potential harm
• A report on potential patient harm following inadvertent flushing of an IV with concentrated potassium chloride instead of normal saline, led to the widespread removal of this product from the nursing units, and the purchase of pre-mixed potassium solutions
• Our multi-faceted internal surveillance programme has demonstrated to us that the detection of hazards and vulnerabilities in hospitals in enhanced when multiple strategies are used- active and passive surveillance maximized the detection of potential or real safety hazards or events, and provided more opportunities to effect change
• Feedback facilitates closing the loop, responding to those who reported the issue, and communicating to the rest of the hospital staff and clinicians about the events and actions taken
• A culture of safety thrives best in a learning organization, “where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together”
### Appendix F

#### Interview Guide

<table>
<thead>
<tr>
<th>Interview Question</th>
<th>Prompt Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell me about near misses that occur in practice at your organization.</td>
<td>Describe what near misses you have observed or heard about in practice?</td>
</tr>
<tr>
<td>Tell me about a near miss that lead to organizational learning.</td>
<td>What responses are there to near misses in the organization?</td>
</tr>
<tr>
<td>What happened as a result of the reported near miss?</td>
<td>What ways does the organization respond to near misses?</td>
</tr>
<tr>
<td></td>
<td>What do you do?</td>
</tr>
<tr>
<td></td>
<td>Does anything else happen around you?</td>
</tr>
<tr>
<td>Tell me about a near miss that occurred in practice but was not reported.</td>
<td>Why do you think the near miss was not reported?</td>
</tr>
<tr>
<td>What do you think contributes to your organization’s ability to respond to near</td>
<td>From your experience, what has facilitated the response in your organization to</td>
</tr>
<tr>
<td>miss occurrences?</td>
<td>deal with near miss occurrences?</td>
</tr>
<tr>
<td>What do you think impedes your organization’s ability to respond to near miss</td>
<td>From your experience, what has blocked your organization’s ability to deal with</td>
</tr>
<tr>
<td>occurrences?</td>
<td>near miss occurrences?</td>
</tr>
<tr>
<td>Who else in the organization should be approached to participate in this study?</td>
<td>No prompts.</td>
</tr>
</tbody>
</table>
Appendix G

Interview Informed Consent

[HOSPITAL X]

Research Ethics Board
Interview Consent Form

**Title of Research Study**
Exploring Organizational Learning from Near Miss Occurrences in the Health Care System

**Principal Investigator**
Dr. Lorelei Lingard, affiliated with the Department of Health Management, Policy and Evaluation, Faculty of Medicine, University of Toronto

**Co-Investigators**
Lianne Jeffs, doctoral student, Department of Health Management, Policy and Evaluation, Faculty of Medicine, University of Toronto.

Dr. Ross Baker, Department of Health Management, Policy and Evaluation, Faculty of Medicine, University of Toronto.

Dr. Whitney Berta, Department of Health Management, Policy and Evaluation, Faculty of Medicine, University of Toronto.

**Informed Consent Form for Interview**
Before agreeing to participate in this research study, it is important that you read and understand this research consent form. This form provides all the information we think you will need to know in order to decide whether you wish to participate in the study. If you have any questions after you read through this form, ask the investigative team. You should not sign this form until you are sure you understand the information. All research is voluntary and you may choose to withdraw at any point without consequence.

**Study Sponsor**
Department of Health Policy Management and Evaluation, Faculty of Medicine, University of Toronto (PhD thesis)

**Purpose of the Research**
This study will explore the phenomenon of near misses and the organizational response(s) to near miss occurrences. Addressing this knowledge gap could contribute to the theoretical and empirical base of how organizations (individuals within the organization) respond to near miss occurrences as a strategy for designing and delivering safer health care.
Description of the Research
This qualitative, descriptive study is taking place solely at Hospital x with three cohorts (senior management, middle management and clinicians). Study participants will be asked to participate in a semi-structured interview session (1 to 1/2 hours) with the possibility of additional interviews. In addition, participants will be asked to indicate their willingness (or not) to participate in a follow-up focus group (1 to 1/2 hours) to validate the findings that emerge from the interview process.

Potential Harms (Injury, Discomforts or Inconvenience)
There are no known harms associated with participation in this study.

Potential Benefits
You will not benefit directly from participating in this study. Findings from the study will be instrumental in creating a theoretical framework around organizational learning around near miss occurrences in the health care system.

Treatment Options
Not applicable.

Confidentiality and Privacy
Confidentiality will be respected and no information that discloses the identity of the subject will be released or published without consent unless required by law. All identifying information will be destroyed. This means that no information will be released or printed that would disclose personal identity. Data will be aggregated (with no personal identifiers) for the analysis. Consent forms of study participants will be stored separately from the data files (transcripts and analytical worksheets). Only the Principal Investigator will have access to the consent forms which will be kept in a locked cabinet for a period of up to 10 years. The dialogue from the interview sessions and focus group will be audiotaped and transcribed by the investigator. During the group meeting we will remind everyone that the information shared is private and should not be repeated outside the group but we cannot be sure that information about you will be kept private. People in groups may share information with others outside the group. The hard copies of data (transcripts and analytical worksheets/notes) and informed consent forms will be shredded 10 years after study completion. Only the investigative team (doctoral student and thesis committee members) will have access to the data prior to destruction.

Publication of Results
Aggregate results may be shared both internally and externally through oral presentations (conferences and debriefings) and written documents (academic and professional journal publications). No identifying information will be included in any of the publications or presentations associated with this study.

Reimbursement
There is no reimbursement for your participation in this study.

Compensation for Injury
There is no risk for injury associated with participation in this study.
Participation and Withdrawal
Participation in research is voluntary. If you choose not to participate, there will be no consequences and will not affect your employment at hospital x or care of your family members at hospital x. If you choose to participate in this study you can withdraw from the study at any time without any consequences. Research findings from the study will be made available to the participants upon completion of the research.

Sponsorship
The sponsor of this research is the Department of Health, Policy, Management and Evaluation, Faculty of Medicine, University of Toronto (part of doctoral studies). There is no funder associated with this study.

Conflict of Interest
I, and the other research team members have no conflict of interest to declare.

Research Ethics Board Contact
If you have any questions as a research subject you may contact (name removed), Research Ethics Manager at (phone number removed) or email at (email removed).
[HOSPITAL X]

Exploring Organizational Learning from Near Miss Occurrences in the Health Care System

Study Participant Consent Form

I, ___________________________________, understand that I am being asked to take part in a study of health care administrators and clinicians at Hospital x. The study will explore the phenomenon of near misses and the organizational response(s) to near miss occurrences.

I understand that it is entirely my choice to participate in this study or not; that taking part is voluntary. I am aware that an initial interview session will take about 1 to 1 and 1/2 hours and will occur in the hospital setting. I further understand that the researcher may also set up additional interview sessions with me and that I may participate in a focus group during the study. The focus group will last about 1 to 1 and ½ hours. I understand that the interview will be audiotaped for the purpose of data analysis and that no one outside of the research team will have access to the recordings, which will secured in a locked cabinet. All information I provide will remain confidential and that my name will not be identified in any report of the study results. The tapes produced from this study will be stored in a secure, locked location. Only members of the research team will have access to them. Following completion of the study the tapes will be kept as long as required in the hospital x’s “Records Retention and Destruction” policy. They will then be destroyed according to this same policy.”

I have been informed that this is a voluntary study and of the alternatives to participation in this study, including the right not to participate and the right to withdraw without compromising my employment status at hospital x or care of my family members at hospital x. As well, the potential risks, harms and discomforts have been explained to me and I also understand the benefits (if any) of participating in the research study.

I understand that I have not waived my legal rights nor released the investigators, sponsors, or involved institutions from their legal and professional duties. I know that I may ask now, or in the future, any questions I have about the study or the research procedures. I have been given sufficient time to read and understand the above information. By signing this form, I agree that:

1. You have explained this study to me. You have answered all my questions.
2. You have explained the possible harms and benefits (if any) of this study.
3. I know what I could do instead of taking part in this study. I understand that I have the right not to take part in the study and the right to stop at any time. My decision about taking part in the study will not affect my employment or have a future impact of my family members who may become a patient at hospital x.
4. I am free now, and in the future, to ask questions about the study.
5. I have been told that my medical records will be kept private except as described to me.
6. I understand that no information about who I am will be given to anyone or be published without first asking my permission.
7. I agree, or consent, to take part in this study.
Printed name of subject  
__________________________  
Subject’s signature & date

Printed name of person who explained consent  
__________________________  
Signature & date

Printed witness’s name (subject does not read English)  
__________________________  
Witness’s signature & date

If you have any questions as a research subject you may contact (name removed), Research Ethics Manager at (phone number removed) or email at (email removed).

If you have any questions or comments around the study, please do not hesitate to contact the investigator at the address given below.

Lianne Jeffs, RN, PhD (candidate)  
Department of Health, Policy, Management and Evaluation, Faculty of Medicine, University of Toronto  
416-979-2019  
lianne.jeffsl@utoronto.ca
Appendix H

Video/Audio Taping Consent Form

[HOSPITAL X]

Video/Audio Taping Consent Form

Informed Consent for Study Participants (Interviews)

**Title of Research Study**
Exploring Organizational Learning from Near Miss Occurrences in the Health Care System

**Principal Investigator**
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**Informed Consent Form for Interview**
Before agreeing to participate in this research study, it is important that you read and understand this research consent form. This form provides all the information we think you will need to know in order to decide whether you wish to participate in the study. If you have any questions after you read through this form, ask the investigative team. You should not sign this form until you are sure you understand the information. All research is voluntary and you may choose to withdraw at any point without consequence.

**Title of Research Study**
Exploring Organizational Learning from Near Miss Occurrences in the Health Care System

**Study Sponsor**
Department of Health Policy Management and Evaluation, Faculty of Medicine, University of Toronto (PhD thesis)

**Purpose of the Research**
This study will explore the phenomenon of near misses and the organizational response(s) to near miss occurrences. Addressing this knowledge gap could contribute to the theoretical and empirical base of how organizations (individuals within the organization) respond to near miss occurrences as a strategy for designing and delivering safer health care.
Description of the Research
This qualitative, descriptive study is taking place solely at the hospital x with three cohorts (senior management, middle management and clinicians). Study participants will be asked to participate in a semi-structured interview session (1 to 1/2 hours) with the possibility of additional interviews. In addition, participants will be asked to indicate their willingness (or not) to participate in a follow-up focus group (1 to 1/2 hours) to validate the findings that emerge from the interview process.

Potential Harms (Injury, Discomforts or Inconvenience)
There are no known harms associated with participation in this study.

Potential Benefits
You will not benefit directly from participating in this study. Findings from the study will be instrumental in creating a theoretical framework around organizational learning around near miss occurrences in the health care system.

Treatment Options
Not applicable.

Confidentiality and Privacy
Confidentiality will be respected and no information that discloses the identity of the subject will be released or published without consent unless required by law. All identifying information will be destroyed. This means that no information will be released or printed that would disclose personal identity. Data will be aggregated (with no personal identifiers) for the analysis. Consent forms of study participants will be stored separately from the data files (transcripts and analytical worksheets). Only the Principal Investigator will have access to the consent forms which will be kept in a locked cabinet for a period of up to 10 years. The dialogue from the interview sessions and focus group will be audiotaped and transcribed by the investigator. During the group meeting we will remind everyone that the information shared is private and should not be repeated outside the group but we cannot be sure that information about you will be kept private. People in groups may share information with others outside the group. The hard copies of data (transcripts and analytical worksheets/notes) and informed consent forms will be shredded 10 years after study completion. Only the investigative team (doctoral student and thesis committee members) will have access to the data prior to destruction.

Publication of results
Aggregate results may be shared both internally and externally through oral presentations (conferences and debriefings) and written documents (academic and professional journal publications). No identifying information will be included in any of the publications or presentations associated with this study.

Reimbursement
There is no reimbursement for your participation in this study.
Compensation for Injury
There is no risk for injury associated with participation in this study.

Participation and Withdrawal
Participation in research is voluntary. If you choose not to participate, there will be no consequences and will not affect your employment at hospital x or care of your family members at hospital x. If you choose to participate in this study you can withdraw from the study at any time without any consequences. Research findings from the study will be made available to the participants upon completion of the research.

Sponsorship
The sponsor of this research is the Department of Health, Policy, Management and Evaluation, Faculty of Medicine, University of Toronto (part of doctoral studies). There is no funder associated with this study.

Conflict of Interest
I, and the other research team members have no conflict of interest to declare.

Research Ethics Board Contact
If you have any questions as a research subject you may contact (name removed) Research Ethics Manager at (phone number removed) or email at (email removed).
Exploring Organizational Learning from Near Miss Occurrences in the Health Care System

Study Participant Consent Form

I, ___________________________________, understand that I am being asked to take part in a study of health care administrators and clinicians at hospital x. The study will explore the phenomenon of near misses and the organizational response(s) to near miss occurrences.

I understand that it is entirely my choice to participate in this study or not; that taking part is voluntary. I am aware that an initial interview session will take about 1 to 1 and 1/2 hours and will occur in the hospital setting. I further understand that the researcher may also set up additional interview sessions with me and that I may participate in a focus group during the study. The focus group will last about 1 to 1 and 1/2 hours. I understand that the interview will be audiotaped for the purpose of data analysis and that no one outside of the research team will have access to the recordings, which will be secured in a locked cabinet. All information I provide will remain confidential and that my name will not be identified in any report of the study results. The tapes produced from this study will be stored in a secure, locked location. Only members of the research team will have access to them. Following completion of the study the tapes will be kept as long as required in the hospital x “Records Retention and Destruction” policy. They will then be destroyed according to this same policy.

I have been informed that this is a voluntary study and of the alternatives to participation in this study, including the right not to participate and the right to withdraw without compromising my employment status at hospital x or care of my family members at hospital x. As well, the potential risks, harms and discomforts have been explained to me and I also understand the benefits (if any) of participating in the research study.

I understand that I have not waived my legal rights nor released the investigators, sponsors, or involved institutions from their legal and professional duties. I know that I may ask now, or in the future, any questions I have about the study or the research procedures. I have been given sufficient time to read and understand the above information. By signing this form, I agree that:

1. You have explained this study to me. You have answered all my questions.
2. You have explained the possible harms and benefits (if any) of this study.
3. I know what I could do instead of taking part in this study. I understand that I have the right not to take part in the study and the right to stop at any time. My decision about taking part in the study will not affect my employment or have a future impact of my family members who may become a patient at hospital x.
4. I am free now, and in the future, to ask questions about the study.
5. I have been told that my medical records will be kept private except as described to me.
6. I understand that no information about who I am will be given to anyone or be published without first asking my permission.
7. I agree, or consent, to take part in this study.

8. I also agree to be taped during this study. These tapes will be used to explore the phenomenon of near misses and the organizational response(s) to near miss occurrences. The interviews with study participants will be taped as part of the data analysis.

9. I understand that I have the right to refuse to take part in this study. I also have the right to withdraw from this part of the study at any time, eg., before or even after the tapes are made. My decision will not affect my health care at hospital x.

10. I am free now, and in the future, to ask questions about the taping.

11. I have been told that my medical records will be kept private. You will give no one information about me, unless the law requires you to.

12. I understand that no information about me (including these tapes) will be given to anyone or be published without first asking my permission.

13. I have read and understood pages 1 to 6 of this consent form. I agree, or consent, being taped as part of the study.

___________________________________  ___________________________________
Printed name of subject                  Subject’s signature & date

___________________________________  ___________________________________
Printed name of person who explained consent  Signature & date

___________________________________  ___________________________________
Printed witness’s name (subject does not read English)  Witness’s signature & date
In addition, I agree or consent for this tape(s)/photograph(s) to be used for:

1. Other studies on the same topic.
2. Teaching and demonstration at hospital x.
3. Teaching and demonstration at meetings outside hospital x.
4. Not to be used for anything else.

In agreeing to the use of the tape(s) for other purposes, I have been offered a chance to hear the tape(s). I also have the right to withdraw my permission for other uses of the tape(s) at any time.

___________________________________
Printed name of subject

___________________________________
Subject's signature & date

___________________________________
Printed name of person who explained consent

___________________________________
Signature & date
# Appendix I

## Dimensions of Vigilance

<table>
<thead>
<tr>
<th>Themes, dimensions, and definitions</th>
<th>Representative transcript excerpts</th>
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<tr>
<td><strong>Responsive Collective Vigilance</strong></td>
<td><strong>“The safety element of care is about detecting and mitigating near miss events, managing them, not preventing them, but managing them. Do I see it difficult to identify them, no I don’t. I see them as routine part of care.” (Medical Doctor)</strong></td>
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<td>A process whereby a deviation in practice or potential threat to patient safety is recognized (caught) and responded to (clarified and corrected).</td>
<td><strong>“Through our discussions with pharmacy they pick up so much near misses, they pick up at the last stage of the safety net, the last slice of the swiss cheese.” (Administrator)</strong></td>
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<td><strong>Catching:</strong></td>
<td><strong>“When the tech goes in and somebody has ordered a unit of red cells and its for a one kg child in the NICU and there’s no way at 15grams/kilo, which is our standard dose, they want that, so they would challenge the order and ‘like what is going on as this does not make sense with this child’ and they would say ‘oh I stamped the wrong name’ ... and that case would never gets out of the lab.” (Administrator)</strong></td>
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<tr>
<td>• Detecting initially that a deviation in practice or potential threat to patient safety exists.</td>
<td><strong>“It occurred and things were fine, omission of drugs we gave it later and we just re-staggered it would be let’s say an antibiotic, the lipid rate we ended up just turning the lipids off and then when the level was drawn it was fine.” (Nurse)</strong></td>
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<td><strong>Clarifying:</strong></td>
<td><strong>“When the tech goes in and somebody has ordered a unit of red cells and its for a one kg child in the NICU and there’s no way at 15grams/kilo, which is our standard dose, they want that, so they would challenge the order and ‘like what is going on as this does not make sense with this child’ and they would say ‘oh I stamped the wrong name’ ... and that case would never gets out of the lab.” (Administrator)</strong></td>
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<td>• Clarifying deviations in practice with originator.</td>
<td><strong>“When the tech goes in and somebody has ordered a unit of red cells and its for a one kg child in the NICU and there’s no way at 15grams/kilo, which is our standard dose, they want that, so they would challenge the order and ‘like what is going on as this does not make sense with this child’ and they would say ‘oh I stamped the wrong name’ ... and that case would never gets out of the lab.” (Administrator)</strong></td>
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<td><strong>Correcting:</strong></td>
<td><strong>“When the tech goes in and somebody has ordered a unit of red cells and its for a one kg child in the NICU and there’s no way at 15grams/kilo, which is our standard dose, they want that, so they would challenge the order and ‘like what is going on as this does not make sense with this child’ and they would say ‘oh I stamped the wrong name’ ... and that case would never gets out of the lab.” (Administrator)</strong></td>
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<tr>
<td>• Preventing harm or minimizing the effect of the committed deviation from practice that either was intercepted or reached the patient.</td>
<td><strong>“When the tech goes in and somebody has ordered a unit of red cells and its for a one kg child in the NICU and there’s no way at 15grams/kilo, which is our standard dose, they want that, so they would challenge the order and ‘like what is going on as this does not make sense with this child’ and they would say ‘oh I stamped the wrong name’ ... and that case would never gets out of the lab.” (Administrator)</strong></td>
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<td><strong>Planned Collective Vigilance</strong></td>
<td>“We tend to see near misses more frequently right, it’s almost become a part of daily functioning around here, that doctor wrote the TPN order I better go check because I know there is going to be a mistake on it, I go and I follow up – it is just part of my job.” (Dietician)</td>
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<td>A process whereby clinicians proactively mitigate deviations in practice by watching over or consulting colleagues.</td>
<td>“Because they [clinical support] walk around and they say you know can we help you, do you need anything, that would be a point in time where I would say can you check this with me or can you just review this x-ray maybe something placed wrong in an x-ray, even having another safeguard in place to bounce ideas off of.” (Nurse)</td>
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<td><strong>Watching Over:</strong></td>
<td><strong>Consulting:</strong></td>
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<td>• Watching over another clinician’s practice in anticipation of deviations in practice.</td>
<td>• Consulting with other clinicians with expertise in clinically uncertain situations.</td>
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<td><strong>Consulting:</strong></td>
<td>“The TPN pharmacists and the dieticians work very closely together to make sure that even what they are prescribing can even be put into the solution and not precipitate out and we often have to talk to them and say if I want this what am I going to have to give on, you know if I want this much potassium, you know, do I have to cut back on my uhm bi-carbs say, or whatever.” (Nurse Practitioner)</td>
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Appendix J

Triggers Influencing Action Approaches

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<tr>
<th>Approach</th>
<th>Trigger</th>
<th>Narrative example</th>
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<td>Doing a quick fix</td>
<td>Managing the pervasiveness of near misses amidst competing priorities</td>
<td>“We’ve been asked to really be better at documenting our near misses, but are there many more that aren’t reported. The reason is because nothing happened to the patient, there are so many other things they can focus on the real things that happened that actually had some patient outcome.” (Technician)</td>
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<td>“The number of near misses are potentially high and people just don’t report every single thing, because that’s all they would be doing. Because of the harm factor to patients and I think they see their role as protecting the patient and if something never reached the patient then there’s no sense of needing to report it because it wasn’t an actual occurrences, they function in a silo they don’t have that broader view of saying now wait a minute if this almost happened here, it could happen again and again elsewhere and they just don’t think that way, they think in the immediate, this is my shift keep my patient safe.” (Quality Manager)</td>
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<td>Associating fear and stigma with near misses</td>
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<td>“I think they don’t want to admit that things can go wrong. I mean you feel bad when things happen, or when you think about the potentials that could happen, and you know you kind of wish that life was perfect and these didn’t happen, I think that is a little part of it.” (Nurse)</td>
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<td>“There’s still a stigma attached to that whole error thing – right, you made a mistake. I wonder if sometimes when you bring stuff like this [near misses] to their attention, they kind of under value it, like it was no big deal or whatever because they don’t want to own up to that.” (Dietician)</td>
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<td>Going into the black hole</td>
<td>Managing the competing priorities (administrators)</td>
<td>“And it get’s filed away and nobody else knows. We don’t have time, this is all in the past month (picks up blue folder). It’s usually at the end of the day, or in the morning when you are swamped with clinic orders coming in for patients who need their stuff in and out so they can leave. So as long as it has been changed and dealt with that’s all that happens.” (Pharmacist)</td>
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| Closing off the swiss-cheese holes | Attributing potential for harm and preventability of near miss | “The more significant near misses event would be reported by the senior nurses but also front-line nurses. There is the potential adverse events and it’s all in the nomenclature, the ones that we see, collectively see, as having two properties, one is the greatest threat to a patient. Two, probably that we are able to address because of so an addressable lower-order, or lower severity potential adverse event will receive as much as a less addressable potential adverse event. But the things that we take most notice of and that influence our clinical practice are the single severe adverse events.” (MD)  
“ I think that these near miss events that have potential to cause significant harm those are the ones as a group everybody would pay strong attention to.” (Pharmacist) |
| Providing leadership and feedback | | “It depends on who the staff person on that month. There is a different amount of importance placed on certain things that happened. So I think it depends on, you know at this level who, the staff person is putting you know putting the flavor on for the month on how important things are how they aren’t. How that person perceives the event because if they don’t, I find other people blow it off too.” (Dietician) |