Creating Safety in an Emergency Department

by

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Abstract

Hospital emergency departments (EDs) are complex, high-hazard socio-technical systems with distinction as sites of the highest proportion of preventable patient harm. Patient safety is threatened by abbreviated and uneven care in an interrupted environment marked by uncertainty, multiple transitions over space and time, and mismatch between demand and resources.

Recommendations for reporting systems, standardization, and 'safety culture' are at the forefront of local, national, and international strategies to improve patient safety. British Columbia is currently implementing a provincial electronic Patient Safety Learning System to enhance reporting and learning, and to facilitate a culture of safety. However, the concept of 'safety culture', while popular and political, remains problematic and theoretically underspecified. Moreover, there is lack of clear evidence about how emergency care providers conceptualize, make sense of, and learn from patient safety incidents, and limited evidence to guide an effective safety learning strategy for providers and staff in a busy ED.

In this multi-perspective, multi-method, practice-based ethnographic inquiry conducted at an inner city, tertiary care ED, I explore how ED practitioners and staff create safety in patient care in their everyday practice.

In this context, 'safety' is an emergent phenomenon of collective joint action, enacted dialogically by multiple actors, within a resilient system imbued with multiple social, cultural and political meanings. I claim that patient safety within an ED (and likely in other health care settings) is most effectively created through dialogic storying, resilience, and *phronesis*.

I present an alternative account to the dominant "medical error" and bureaucratic "measure and manage" discourse, and propose an approach to creating safety, including an open communicative space to facilitate sharing stories and learning about patient safety incidents, a safety action team charged with systems analysis and empowered to enact change, and an inter-professional simulation learning environment to enhance dialogic sensemaking and innovation, that offers more to facilitate safety and resilience in everyday practice. I advocate for a pragmatic practice-based account of patient harm within an ongoing reflective conversation about safety and performance, and for foresight and resilience in anticipating and responding to the complexities of everyday emergency care.

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Out of this nettle, danger, we
pluck this flower, safety

Henry IV, part 1, act 2, scene 3

Shakespeare

Chapter 1

Introduction

"Remember that patient?"... (my heart sank, my pulse quickened, and I could feel the pit of my stomach turn) "The one that fell on the ski hill?" I remembered. I'd seen him a few days earlier on a busy Saturday night. He'd complained of feeling dizzy after falling. "What happened?" I ask. "He came back a few hours later seizing." Ouch, I think, what did I miss? "He's in the ICU now, vertebral artery dissection." I felt my legs go weak.

Ken[1] was a young foreign student in his early 20's, visiting from overseas. It was his first time snowboarding. He had fallen on the beginner slope, but had been able to get off the hill. He didn't speak English. He had come with his friends and to-

[1] pseudonym

gether we pieced the story together through the language barrier.

"What's the problem?" "Trouble walking." "Does he have a headache?" "No." "Does his neck hurt?" "No." "Did he get knocked out or lose consciousness?" "No." "Has he vomited?" "No."

He was alert and oriented according to his friends, made sense to them, and was in no pain. His Glasgow Coma Score was a normal 15, and he appeared to demonstrate normal interactions with his friends. I examined him from head to toe looking for signs of injury or neurological dysfunction. His pupils were equal, he had no visible nystagmus, no scalp or cervical spine tenderness, and his active neck range of motion was painless. His tympanic membranes were normal, and his hearing was intact. He had no signs of trauma above his clavicles. He had no lateralizing weakness, and his reflexes were symmetric. He displayed no pronator drift, and his rapid-alternating movement test, and heel to shin test were normal. He had no cerebellar signs. My examination was negative.

I got him up to walk, but he held onto his friends. Hmm. Negative physical exam, yet unable to walk without support. I ordered a head computerized tomography (CT) scan. Almost two hours later I read it as normal (later reported by the radi-

> ologist as "within normal limits"). I tested his gait again. He still felt unsteady, but no worse than earlier. I discussed his case with one of my more experienced colleagues. "Perhaps he has a vestibular concussion," he said. I talked to his friends and told them the scan was normal. I suggested they take him home and bring him back the next day if his symptoms persisted. Even now, a decade later, I can see them walking down the hall.

"Remember that patient" — three words that incite panic for any emergency physician. Seen in retrospect, my failure to diagnose his vertebral artery dissection contributed to a delay in diagnosis. If only I had considered the possibility and arranged for an MR angiogram on a Saturday night, my counterfactual argument goes even now, then perhaps heparin could have been started to prevent the progression of his cerebellar infarct.

There is, however, a "second story" [1]. It is a story — my story — from "inside the tunnel" [2] of an environment fraught with hazards, pitfalls, and systemic vulnerabilities. It was a busy Saturday night. The waiting room was packed. I examined Ken on a stretcher. He looked well and in no distress. It took some time to get his story. He could not speak English, and the English his friends spoke and understood was limited. Vertigo symptoms are common following a mild head or whiplash injury, and it seemed likely that he had a minor head injury. I had examined him thoroughly. His fall did not involve a high energy mechanism. He had

been on the beginner slope and had fallen backwards. There had been no crash. He met no criteria for imaging [3–5]. However, in light of his ataxia and language barrier, I ordered a CT scan of his head. I was ruling out an intracranial bleed, perhaps a subdural hematoma, a much more common diagnosis, and not a vertebral artery dissection with cerebellar infarct, a rare diagnosis. I had seen patients with cerebellar strokes, my mother had one and could not get out of bed because of the vertigo and nausea. Ken did not have those symptoms, nor any other cerebellar signs. When the scan came back negative for fracture or bleed, I was reassured. I informally consulted a colleague, and together we thought it plausible that he had suffered a vestibular concussion. Although I was pressed to see other patients, I had not anchored on one diagnosis, nor had I rushed to judgment. My working diagnosis was based on probability. I had been careful, and had acted on what made sense. Hence, I was surprised by the outcome that followed the query . . . "remember that patient."

1.1 Introduction

This dissertation is about the safety of patient care in a hospital emergency department (ED). What follows is a multi-level ethnographic analysis of the situated patterns of interaction between emergency healthcare providers, staff, and administrators that have a direct bearing on safe patient care. In short, it is about creating safety. I go beyond the concepts and discourse of "medical error" [6–10], reliability, and quality [11–13],

and functional models of 'safety climate' as a proxy for 'safety culture' [14–16], to consider how my colleagues and I at a tertiary care, inner city, academic ED in Canada create safety for patients amidst the complexity of providing care. I present an account of our successes and failures within the "messy details" [17] in everyday practice, our patterns of interaction, and our conversations about patient safety.

Safety (as action in practice) is constructed through stories [1, 18–25]. Hence, I think with stories [26] to explore how they help make sense of tragedy, how they account for practice [27], how they contribute to healing and learning, and how they facilitate, and indeed are critical for organizational change. I approach the problem of patient safety in EDs from the perspective of 'practice' within a socio-technical system. Here, I use 'practice' in the sense of the *modus operandi* of everyday human action to explore how safety is created in the *in situ* "mess" of normal ED operations. Drawing on recent research in social theory, safety science, cognitive science, organizational science, and ethics, I look upon the delivery of care in an ED as an inherently dynamic and complex situated practice or "activity" [28], and emphasize the embodied and embedded nature of perception, and the "dialogic" nature of sense making [29, 30] as a key to safe practice.

I suggest that safety is enacted in collective practice, and that 'safety culture' emerges in a reflective practice of care [26, 31–33] that fosters adaptive resilience and foresight [34, 35]. Hence, I claim that patient safety

within the operational setting of an ED (and likely in other health care settings) is most effectively created through dialogic storying, resilience, and *phronesis*[2] [26, 31, 33–43]. In so doing, the main contribution of this research is to provide an alternative account to the dominant "medical error" [44] and "measure and manage" [25] discourse. I do so to advocate for a pragmatic practice-based account of patient harm within an ongoing reflective conversation about safety, as well as for foresight and resilience in anticipating and responding to the complexities of everyday emergency care.

1.2 Background

The present day healthcare system is complex and under stress, and perhaps nowhere more so than an ED [45]. Hospital EDs are crowded, high-risk healthcare environments that pose a threat to patient safety [46–48]. EDs are brittle [49], and vulnerable to failure [50–55].

"Error" and "preventability", however, are in the eye of the beholder [56–58]. Patient safety is threatened by abbreviated and uneven care in a dynamic, time pressured, and interrupted environment marked by high levels of uncertainty, multiple transitions over space and time, and mismatches between demands and resources. Emergency care providers attend to multiple acutely ill or injured patients, and cope with high decision density and cognitive load, distractions and competing demands,

[2]The Aristotelian meta-virtue of practical thought, usually translated as "practical wisdom"

shift work and transitions, sleep deprivation and limited breaks [47]. Time pressures create risk secondary to efficiency-thoroughness trade-offs [59]. EDs attempt to maintain resilience in the face of coping with "anyone, anything, anytime" [60, 61], but routinely exhibit brittleness in adapting to make "safe space" [62]. EDs have been referred to as "canaries in the mine shaft" of the healthcare system,[3] and collectively described as "at the breaking point" [45].

There have been few published ethnographic studies of EDs, and no ethnographic or fieldwork studies specifically directed at 'safety culture' in this setting.[4] Several observational workplace studies, however, have been conducted looking specifically at communication [63–69], or tasks [70–72] in EDs, each of which are central aspects of 'practice' and, in turn, 'safety culture'. This research points to the vulnerabilities of an ED that I have outlined above — time pressured, multiple transitions, interrupted communication, and competing demands.

Thus, EDs require a robust 'safety culture' to mitigate and prevent patient harm. Since safety emerges out of dynamic interactions embedded in shared practice [56], creating patient safety is something we do — everyday. Safety is a dynamic and distributed construct transmitted in stories and practice [19], and thus the stories we tell one another about patient

[3] Title of the Canadian Association of Emergency Physicians annual meeting in 2007

[4] A database search of Academic Search Complete, CINAHL, MEDLINE, PsycINFO, SocINDEX and Google Scholar with the terms "ethnography OR fieldwork" AND "safety culture OR patient safety" AND "emergency department OR emergency room"

care (successful and unsuccessful) facilitate reflection, sensemaking, and learning [29, 73]. Narrative (story) sensemaking helps us understand each other's way of viewing the world, and in turn co-creates a new story that has the power to transform [74]. Safety learning must take into and be based on accounts of work-as-done to afford a dialogue for learning.

Thus:

> I can only answer the question "What am I to do?" if I can answer the prior question "of what story or stories do I find myself a part?" [75, p. 216]

Yet, there are obstacles that impede growth and maturation of our patient 'safety culture'. Storying and feedback about patient safety is primarily informal and local. Hierarchies, silos, and separate professional identities, (physician, nurse, staff, or administrator) frustrate communication and collaboration, and thus form barriers to a functional multidisciplinary communicative space for system safety learning in our department.

Like many healthcare departments, organizations, and jurisdictions that are attempting to tackle the problem of patient harm [76–79], the province of British Columbia is implementing a province-wide, web-based safety event reporting system. The Patient Safety and Learning System (PSLS) is intended to support the reporting and analysis of patient safety events across the continuum of care, to facilitate system-wide learning from experience, and to help create and nurture a culture of safety [80].

Yet, while the PSLS may hold promise in characterizing critical incidents, it alone can neither make safety happen, nor help create a 'safety culture'. Moreover, the current structure and process of the PSLS may limit rather than enhance safety learning. Patient safety is not about reporting. Rather, safety is about giving account and learning in practice from success and failure, and about enhancing anticipation and resilience to care processes moving to the edge of safe performance [81]. Thus, threats and hazards are identified and given meaning through the giving of account in dialogue with a community of practice that remains sensitive to the possibility of failure [82]. Learning from success as well as failure leads to greater understanding and foresight than learning from failure alone. Safety emerges out of everyday socio-technical interactions, anchored in human relationships based on trust, and "lives" in an ongoing conversation that fosters adaptive resilience.

Although reporting of patient safety events is conventionally considered to be a component of an effective 'safety culture' [83], it is insufficient to foster a robust 'safety culture' at the unit level. Collection of safety "statistics" that have been stripped of context and emotional salience offers scant, if any useful information [25], and limits the voice and contribution of providers at the point of care. Investigation and analysis of safety event data will only nurture our local 'safety culture' if it helps us make sense of our work, and if there are resources for deep analysis and feedback, and political will to learn and enact change.

Patient safety requires system learning from patient harm and threats to safety. Based on the exemplar of the Aviation Safety Reporting System, reporting systems are suggested as a pivotal strategy to facilitate safety learning. The purported logic underlying the focus on reporting holds that incident reporting will provide the information necessary to prevent patient harm, but reporting systems cannot account for meaningful learning that is situated in practice and co-created between practitioners and leadership. Under-reporting is significant and pervasive, and commonly attributed to fear of blame and retribution. Hence, a non-punitive response, or "just culture", is promoted as a strategy to improve incident reporting on the belief that more data will promote safety learning.

Moreover, the evidence that incident reporting systems contribute meaningfully to system safety learning in healthcare is weak, and does not support the logic that more incident data leads to more safety learning. On the contrary, major limitations to reporting are lack of feedback, lack of system learning [84–88], and significant "decontextualization" [25].

Currently, system safety learning primarily occurs outside of incident reporting structures [89, 90]. Hence, the problem is less one of data acquisition (reporting), and more one of learning from the data available (analysis and information sharing). Fear of blame is replaced by empirically grounded skepticism that incident reporting leads to any benefit. If reporting systems are to provide any benefit for system safety learning, at either the local or organizational level, it behooves proponents to ensure

a robust and sophisticated investigation and response. Reporting systems must support investigation and analysis of success and failure in practice in order to lead to successful safety action. Failure to do so will spiral skepticism into cynicism.

In this account of a local ED, I seek to understand what we (administrators, nurses, physicians, and staff) have in common with, and where we differ from, other high-hazard units within the organization, and in comparison to other EDs across North America. Why are we resilient and excel when we adapt and work together, but brittle and fail when we are rigid and inflexible? Why are our interactions based more on professional than departmental or organizational identities? I will demonstrate how our communication patterns leave limited room for dialogue and shared sensemaking, and why lacking an open communicative space to learn from each other, we have no systematic way of detecting the safety "gaps" in our operational environment. I compare our 'safety culture' and communication patterns with other EDs and show how we are similar, yet unique. In general, while we must balance operational and patient care demands, our everyday conversations are more about efficiency and production than about safety.

Accreditation organizations now require healthcare facilities to conduct patient 'safety culture' surveys. I go beyond this method of "measuring" 'safety culture', and demonstrate the limitations of this approach. I propose an approach to creating a culture of safety that includes an open

communicative space to facilitate sharing stories and learning about patient safety events, a safety action team charged with systems analysis and empowered to enact change, and a inter-professional simulation learning environment to enhance dialogic sensemaking and innovation. These interventions, more than a new reporting system, will help facilitate and build a robust 'safety culture' in an ED, and lead to improvements in safety and resilience in our everyday practice.

I do not pretend to give a definitive account of patient safety in our ED. My account is presented so that it may provoke other accounts, and facilitate a critical dialogue on creating safe care for emergency patients. The relational values of dialogue and community are not offered as strict prescription, but as a plausible direction [91]. I walk the "narrow ridge" [92, p. 55] not to provide a definitive answer, but to facilitate a needed and deeper conversation about our collective care for patients.

1.3 Motivation

My motivation for this dissertation comes from my practice as an emergency physician. Ken's story was a watershed moment. I hope that his story will be the most catastrophic "mistake" of my career, but I recognize my fallibility as an emergency physician, and our collective vulnerability as an ED.

I was drawn to this area of research after a pre-publication presentation of the Canadian Adverse Events Study (CAES) [93]. The CAES did not in-

clude EDs, so my initial question was about the burden of injury related to patient harm in this setting. Like many EDs, we were overcrowded and understaffed, and were struggling to deliver care in hallways and the waiting room. On many days I would not see a single patient in a traditional nurse-staffed stretcher. Given the opportunity to present departmental Grand Rounds, I thought patient safety might be an interesting topic for discussion. Little did I think that it would turn into a dissertation.

My original naive intent was to create a tool to count patient safety incidents. Recognizing the limitation of data-poor documentation on ED charts, I planned to explore the reporting and learning culture, and to construct and pilot a measurement tool. I submitted a proposal and applied for funding and ethics approval.

As I waited, the context changed. In the summer of 2005, there was a cluster of patient deaths in the ED waiting room. This proved to be a tipping point for the department and the organization.[5] For years, the ED leadership had been pressing hospital leadership about the overcrowded conditions, but their concerns had not led to any action to relieve "access block".[6] If the hospital was full, then the ED was forced to accommodate both admitted patients (stable) and incoming patients (unknown, potentially unstable). However, since senior leadership was present when the cluster of waiting rooms deaths was presented at monthly Morbidity and

[5]The emotional salience of these stories was profoundly disturbing for how the organization perceived itself.

[6]Admitted patients are warehoused in the ED until a ward bed becomes available.

Mortality rounds, the conversation changed. Over the succeeding months, the ED leadership told and re-told those patient stories, and by the time I started interviews in February 2006, the region had implemented the Overcapacity Protocol.[7]

During the process of 'questerviews' using the Hospital Survey on Patient Safety Culture (HSOPSC) [15], I became aware of the provincial initiative to implement the Patient Safety and Learning System (formerly known as the Incident Reporting and Information System). Hence, it no longer made sense to create another tool. However, there was still a need to understand how the PSLS would work in the ED environment, and how it might improve upon the existing incident reporting system. In addition, having witnessed the success of stories for learning and creating organizational change, I revised my proposal and research strategy towards understanding interactions, dialogue, and community, thereby expanding my concept of 'safety culture' in order to move beyond simply reporting to get to the deeper dynamic of how safety is created as an emergent property of our work.

1.4 Rationale

Recent observations from social theory, cognitive science, and safety science, advocate an alternate view to the Cartesian-Newtonian paradigm that predominates in the Western world. In this section I briefly review as-

[7] A system response when the ED has reached a threshold of admitted patients.

pects of the broad family of practice theories [94], interactional and contextual theories of sensemaking [29, 30], the embodied cognition thesis, and resilience engineering, and consider their implications for understanding patient safety in an ED. Central to these approaches is movement beyond the problematic dualisms of subject-object, structure-agency, and mind-body towards a more integrated perspective.

1.4.1 Practice

Although there is no unified practice approach, most theorists conceive practices as embodied and materially mediated nexuses of human activity organized around shared practical understanding [94, p. 2]. Practices are collective understandings and actions sustained through the interaction and mutual adjustment among people engaged in a particular set of tasks [95]. Moving beyond individualism and mentalism, practice theories converge with the recent embodied and embedded model of cognition, and highlight critical capacities such as tacit understanding, dispositions (*habitus*), know-how, and skills. Hence, practices are a nexus of *routinized* and integrated performances [96, 97] based on interaction.

1.4.2 Dialogic Storying

Dialogic storytelling provides a theoretical approach to understanding interaction. Dialogic theories also include the perspective that human sensemaking is action-based, interactional and contextual, and constituted in

interdependent relations with "the other" [30]. Dialogism is a meta-theoretical framework that regards interactions, activities and situations as primary, wherein the basic constituents of discourse are interactions and semiotic mediation (communication). Action, communication, and cognition are thoroughly relational (inter-relational) and interactive in nature, and must be understood in their relevant contexts. Contexts are marked by "double dialogicality", that is, both within situated interactions and with sociocultural practices (culture). Hence, intersubjectivity[8] is the defining property of communication [98]. Understanding *in situ* is related to the ability to anticipate and respond. "Every word is directed towards an answer and cannot escape the profound influence of the answering word that it anticipates" [99, p. 280].

Perception of the environment is infused with emotive evaluations [100, 101], and value-laden. Meanings are generated in situated thinking and communication, and shaped by human projects and social commitments [102]. Sensemaking is a dynamic undertaking that is linked to personal and group evaluation of context, and belongs to the "interworld" between individuals and their environment [30, 103]. However, since understandings are never complete, though often sufficient for practical purposes [104], miscommunication is often collectively and reciprocally generated.

Human understanding is fundamentally based on narrative [105, 106], and meaning making is pragmatically attuned to social context. The com-

[8]The sharing of subjective states by two or more individuals

plexities of work and work relationships can be reflected in storying [74, 107] — particularly dialogic stories — which allow for nonlinear understandings [108], and encompass multiple perspectives, tensions, and contradictions (alterity and 'heteroglossia') [99]. Storytelling embodies our need for ontological sense-making and existential reassurance [109] and creates narrative coherence between how we act and the accounts we give.

Narrative reasoning seeks to understand in terms of human experience and purpose [73, 110]. Key aspects of stories include [111]:

1. Stories are told from a perspective.

2. The act of storytelling is used by tellers and audience to make sense of experience.

3. Stories are both linear and non-linear. They convey multiple and complex tellings, depicting events as emerging from the interplay of actions, relationships and environments. Hence, they are suited to capture the complexity of work.

4. Stories are embedded or situated in context. Particular stories are nested within organizational meta-narratives.

5. Stories bridge gaps between formal and informal space.

6. Stories are action oriented, depicting what happened, thus shaping future action.

7. Stories embrace and depict the tension between routine and the novel.

8. Stories can be counterfactual or subjunctive, allowing for alternate visions.

Bakhtin centred social life in the "utterance". However, the utterance was not conceived as a communicative act of an autonomous individual; instead, Bakhtin's notion was notably social. The utterance, to Bakhtin, exists at the boundary between two consciousnesses; it is a link in a chain, a link bounded by both preceding links and the links that follow [112, p. 94]. The concept of the chronotope, meaning "time-space" [99, p. 84], features centrally in Bakhtin's dialogism theory and underscores Bakhtin's position that social life is best understood locally and concretely. The implication of this concept is that contradictions are best understood *in situ*.

1.4.3 Embodied and Embedded Cognition

Embodied understanding is rooted in the realization of the body as the meeting point between mind and action, and between individual and environment [113]. Developments in the field of cognitive science and the philosophy of mind present a challenge to the traditional positivist concept of the autonomous individual. Recent work has focused on the enacted [114], embodied [100, 115], socially and culturally situated (embedded) [113, 116–120] and distributed (extended) [121, 122] nature of mind [123].

This view of cognition is based on four assumptions [124]: cognition is for action; cognition is embodied in sensorimotor abilities and the environment; cognition (adaptive action) is an emergent outcome of sensorimotor interaction between agent and task and environment; and cognition is distributed spatially and temporally across (tools, people, and groups) social agents and the environment through artifacts (tools) and social relationships [121]. Hence, knowledge as capacity for adaptive action within an environment, cannot be reduced to representations of behaviour or the environment [125]. The image of the autonomous individual, who chooses action based on reasoning about his or her own preferences, attitudes, beliefs, and values, is a meta-theoretical assumption that is not supported by this body of empirical evidence.

Social perceivers are driven by pragmatic concerns, striving for and generally attaining "good enough" accuracy to suit their everyday needs for adaptive action [124]. Thus, use of shortcuts and heuristics are adaptive [126, 127]. The situation/environment is both a recipient of action as well as an interactive supplier of constraints/enablements in a process of "continuous reciprocal causation" [115]. Environments provide resources (supports, scaffolding) that can simplify or complicate an agent's tasks. "Far from the Cartesian ideal of detached contemplation, real agents *lean* on the world. The world is its own best representation and its own best simulation" [italics in original 115, p. 63]. Hence, the theoretical focus must be on the interaction of agent and environment. This focus

denies simple (cause and effect) attributions of behaviour, especially goal-directed, adaptive behaviour, to "inner" characteristics of the agent [128, 129]. However, in Western culture, we typically choose to explain events in terms of people's supposedly purposeful actions and traits rather than situational factors [130–132]. This tendency is a fundamental attribution error that contributes to a climate of "blame, shame, and train".

Convergence from practice theory, dialogic theory, and embodied cognition fundamentally reframes the conception of the individual practitioner and argues strongly for understanding norms and values, and work-as-done *in situ*. Culture is a body of practices. We participate in and shape culture by all that we do. "This perspective places culture in its true role as one of the central constraints on situated and adaptive action" [124, p. 102]. Hence, adapting from Hutchins [133], the question of interest to patients should not be whether a particular healthcare provider is performing well, but whether or not the system that is composed of the healthcare providers and the technology of the ED environment is performing well.

The computational model of human cognition suggests that we are equipped with primitive hardware and buggy software [134]. Yet, "If we are so stupid, how did we get to the moon? [135]" We can resolve the discrepancy between evidence of individual psychological shortcomings and the empirical fact of moonwalks by observing that individuals did not make it to the moon, NASA *as an organization* did (just as NASA *as an organization* created the Columbia and Challenger disasters [136]). Organiza-

tions discover ways to avoid or repair (or create) individual shortcomings through deliberative analysis (or ignoring small signals), trial and error learning (or rote), serendipitous accident (or dismissing critical events), or more commonly, through ad hoc intuitive rules (or rigid procedural constructs) that emerge from day-to-day practice. Individuals face cognitive limitations and shortcomings, and organizations can provide (or not) individuals with norms and procedures that may mitigate their limitations and reduce their shortcomings [134]. This communal or community ideal offers a counter to traditional atomistic individualism, and lends itself to an understanding of clinical work as an embedded and distributed practice.

1.4.4 The "New Look" Paradigm

The foregoing discussion of practice, dialogic storying, and embedded cognition, illuminates the focus on interaction that lies at the heart of the "new look" paradigm of system safety. The "new look" paradigm [1, 10, 56, 137] emphasizes the role of system and environmental constraints on human-system interactions, and moves beyond individual "error" to explore the situated actions of human actors within resource-limited systems as they create safety while pursuing the multiple competing goals of their everyday work [56]. Human "error" in this paradigm is regarded as a symptom and not a cause. Failure is usually preceded by normal people doing normal work that makes sense given their situational constraints,

pressures and organizational norms ('local rationality') [56, 126, 127]. Failure then, cannot be understood by focusing on where human actors went wrong, but rather by seeking to understand how their assessments and actions made sense at the time, given their surrounding hazards, trade-offs between multiple goals, and interactions [56, 137]. Helping people cope with complexity under pressure through resilience that has been "designed and trained into the technical and human components of the system so that "errors" can be more easily detected, more easily corrected when detected, and less harmful when undetected" likely offers the most promise for success [138, p. 335][10].

One of the basic principles of safety management is that factors associated with "error" at the "sharp end"[9] are the least manageable links in the causal chain because they are unintended and unpredictable. Safe performance and "error" are two sides of the same coin, and human fallibility can therefore only be moderated, not eliminated. Therefore, system structures and processes should be designed to minimize the causes of "errors", make it easier to undo actions or make it more difficult to do what cannot be undone, make it easier to discover and correct errors that do occur, and change attitudes to encourage admission and study of mistakes in order to permit improvement [139]. Hence, the focus of the organizational "error" model is placed on enhancing system and human performance in the

[9]The "sharp end" refers to the personnel or parts of the healthcare system that are in direct contact with patients

face of uncertainty and variability in order to reduce "errors" and adverse events.

Systems design in safety-critical industries such as aviation, rail transportation, and nuclear power has been guided and informed by in-depth systematic analysis of the organizational influences and cognitive mechanisms underlying "error". Studies of industries that maintain high levels of reliability and safety in the presence of risk from potentially disastrous events has identified specific organizational characteristics that contribute to "mindfulness" [140] including commitment to resilience, sensitivity to operations, deference to expertise, reluctance to simplify, and preoccupation with failure [141]. "High reliability organizations" demonstrate their commitment to excellence by actively seeking knowledge about what they do not know, communicating the picture to all levels of the organization, and designing reward systems that recognize both the costs of failures and the benefits of reliability [141, 142].

Rochlin [143] posits that a collective commitment to safety is an institutionalized social construct. Stories and rituals transmit operational behaviours, group culture and collective responsibility. The resulting "culture of safety" is a dynamic, inter-subjectively constructed belief among actors in the potential for continued safety in carrying out their operations. The constructed narrative is one of organizational rather than individual performance. Rochlin [143] further argues that conventional approaches to safety culture do not capture the mythic and discursive dimensions of

operational safety, and he encourages further inquiry into safety as an expression of agency as well as structure, and of interactions and ritual.

1.4.5 Contemporary View of Accidents

The view of how accidents occur has undergone a series of shifts in the past century [144–146]. The view of accidents as the culmination of a simple linear, sequential, and largely technical (or mechanical) cause-and-effect chains of events [147], has been gradually replaced by a systemic view that understands accidents to result from a dynamic combination of human, technological and organizational factors that are each necessary, but only jointly sufficient [1, 142, 148, 149]. Unlike the historical view of accidents as a combination of technical or human failures, the systemic view of accidents does not focus on the failure of one or more components or barriers. Rather, it recognizes that confluences occur, and provides a plausible and broader explanation for why they happen. Accidents cannot be adequately explained in simplistic cause-and-effect terms, but instead are due to complex interactions and dynamic coincidences that result from the normal performance variability of a system [35, 144, 145].

1.4.6 Resilience

Safe practice is not simply a question of eliminating risk, for risk is inherent in everyday clinical work. Safety is a dynamic non-event [150–152], that emerges in the presence of a deep adaptive capacity to cope and sus-

tain operational performance in the face of threat. Resilience is the ability of a system to adapt, bounce back, or transform into a new state under conditions of stress.[10]

In this dissertation, I explore how healthcare providers create resilience and safety while coping with complexity in the everyday practice of emergency medicine through a multi-method, multi-perspective, practice-based ethnographic inquiry. Seen through the lens of practice theory, and situated in a dialogic ontology, "we" studied "us" [153]. My unit of analysis is the ecology of our local-historical collective joint action, and my goal is to understand the dynamics that facilitate inclusive and transformational organizational change from within.

1.5 Statement of Problem

Hospital EDs are complex, high-hazard socio-technical systems that have been tagged with the dubious distinction as sites of the highest proportion of "preventable" patient harm [50–55]. "Error" and "preventability", however, are "in the eye of the beholder" [56–58]. Recommendations for "error" reporting systems, standardization, and 'safety culture' are at the forefront of local, national, and international strategies to improve patient safety, despite limited evidence for their effectiveness in reducing patient harm [86–88, 154]. The concept of 'safety culture' in particular, while popular and political, remains problematic and theoretically underspecified

[10] Sailing close hauled in a dinghy on the chop of English Bay captures the dynamic.

[155–157]. The Patient Safety Learning System will soon be implemented in our ED, but there is a lack of clear evidence about how emergency care providers conceptualize, make sense of, and learn from patient safety incidents, and limited evidence to help guide an effective safety learning strategy for providers and staff in a busy ED.

1.6 Statement of Purpose

Safety is a dynamic social construct transmitted in stories and rituals [19] about what is important in an organization and what attitudes and behaviours related to safety are valued and normal. Hence, I invited a conversation on safe patient care, and co-created these stories to explore and describe the culture of safety in our ED. An understanding of our 'safety culture' will provide a framework to enhance learning from patient safety events, help foster operational resilience and foresight, and inform adaptation of the Patient Safety Learning System for use in the ED.

1.7 Aim

The main aim of this research is to explore how safety is created in the everyday practice of health care delivery in a hospital ED, and to describe the situated and distributed patterns of interaction that impact safety.

1.7.1 Specific Aims

Within this broad aim are four specific aims or objectives:

- To describe how safety emerges from the everyday practice of emergency care
- To explore how emergency healthcare professionals make sense of and learn from patient safety events
- To describe perceptions of safety and compare them to reflections on safety that emerge on deeper inquiry
- To describe patterns of interaction in an ED in order to understand the organizational issues that affect patient safety

1.8 Organization of Thesis

The central focus of this dissertation is the creation of patient safety in the operational setting of a hospital ED. The organization of the thesis is as follows:

In this chapter I have introduced the problem of patient safety in emergency healthcare delivery, and presented the problem of 'safety culture' and reporting systems. I detailed my aim and objectives, and lay out my approach to address them.

In Chapter 2 I review patient safety and emergency medicine, including the estimated burden of injury, known threats and hazards, and the limits and gaps in our knowledge. I review the concepts of safety and 'safety culture', and discuss reporting systems. I then review accident

models and the 'new look' safety paradigm, and present my practice-based theoretical embedding.

Chapter 3 considers issues of data collection and analysis. I introduce the setting, and outline my assumptions and methodology. In particular, I discuss the 'questerview' strategy of using a semiotic stimulus in a facilitated dialogue.

Chapters 4 through 6 present the findings of my analysis. Chapter 4 looks at the 'measurement' of 'safety culture', comparing findings from the 'safety culture' surveys and the corresponding domains in the 'questerviews'. Chapter 5 expands on the survey findings to include themes from the 'questerview' and focus group interviews that go beyond the domains of the survey instruments. In Chapter 6 I describe my observations of the ED as a complex adaptive system, focusing on patterns of interaction and communication to explicate the resilient/brittle character of the department.

Chapter 7 presents my overall conclusions, putting them into context with related work. I summarize the findings and my premises, and point to safety as a 'phronetic' practice of care. Finally, implications, recommendations, and areas of future research are discussed.

Chapter 2

Review of Literature

In this chapter, I review the problem of patient harm in hospital EDs and the overarching strategy proposed to address the problem — 'safety culture'. I adopt an ecological focus, include the concepts of adaptive capacity and resilience, and ground my argument in theory on situated learning and practice. The chapter is organized into five main sections.

First, I begin with a brief historical overview. I then summarize what is known about the burden of iatrogenic injury in EDs from population based retrospective chart review studies, and compare estimates of injury with findings from other strategies, including closed claims, death reviews, active solicitation, and structured observation. Next, I summarize known vulnerabilities in emergency care, with emphasis on capacity, cognition, communication, and collaboration. Having described the problem of patient harm in EDs, I turn to survey the concept of 'safety culture'

and the practice of reporting. Here, I discuss the confusion surrounding the concept of 'safety culture' and the challenges of measurement.

In the third section, I explore sensemaking, and review frames, models, and paradigms that influence how we approach safety. I then look to safety learning, and argue for story dialogue that embeds safety in a community of practice. I introduce resilience as a strategy to advance patient safety in emergency care, with emphasis on adaptive capacity and foresight. Finally, I outline the theoretical underpinnings of my paradigm of inquiry as a practice-based ethnography.

2.1 Introduction

Hospital EDs are complex, high-hazard healthcare environments that pose a threat to patient safety [44, 46–48, 158–160]. Ironically, EDs emerged in the interests of patient safety, and have become key components of the social safety net [161]. Yet, as healthcare delivery shifts towards ambulatory care, EDs have become an increasingly brittle part of the healthcare system [45]. A hospital ED exemplifies the characteristics of a complex adaptive system (CAS), and is among the most dynamically interactive of complex socio-technical systems with risk of failure and harm. Patient care is successfully delivered in a crowded, unbounded, interdependent, and continuous operational environment, where safety is created in everyday practice through anticipation, flexibility, vigilance, and resilience, and fails through gaps in communication, sensemaking, and responsibility.

2.1.1 The Birth of Emergency Departments

In the early days of the 20th-century Anglo-American hospital, care for the injured most often began in a one or two bed "accident room." "Accident rooms," "emergency rooms," or "accident and emergency rooms," were the only door open around-the-clock, and the place for those with acute injury or illness or no place else to go. Medical evaluation was brief, laboratory investigations were minimally available and seldom used, and although hospital admission rates were high, patient turnover was rapid [162].

> Ask any resident his first and last impressions of the Accident Room and you will get a sentence in which the words "sweat," "urine," "vomit," "sputum," and "general filth" would play a large part [163, p. 225].

As medicine became increasingly specialized, and the number of general practitioners declined, the number of patients presenting to hospital emergency rooms increased. The public preference or need to seek care at a hospital when an emergency arose led to a tripling of emergency room visits in the United States from 9.4 million to 28.7 million between 1954 and 1965 [60]. As more patients visited emergency rooms across most of the modern world in the 1960s and 1970s [164], the inexperience of care providers led to the common perception of emergency rooms as places of poor-quality medical practice, the "weakest link" [165–167] and "a neces-

sary evil" [168]. As the authors of the landmark report *Accidental death and disability: the neglected disease of modern society* [169] noted:

> For decades the "emergency" facilities of most hospitals have consisted only of "accident rooms," poorly equipped, inadequately manned, and ordinarily used for limited numbers of seriously ill persons or for charity victims of disease or injury. ...Society now looks to the hospital emergency department as a community center for outpatient care ...In contrast to staff coverage of the "accident room" by a hospital attendant and perhaps an intern, minimal demands call for around-the-clock staffing by permanently assigned physicians and paramedical personnel trained in all aspects of the care of trauma ...The number of physicians experienced in the treatment of multiple injuries is very limited. The need is now recognized for special training in immediate care and in the overall direction of emergency departments, of a calibre commensurate with that attained by only a few individuals in active military field units caring for combat casualties [169, p. 18-19]

The safety of patients, and injured patients in particular, was put at risk by an inadequate medical and hospital system. In Canada, emergency rooms of urban hospitals were staffed by physicians without formal training in emergency medicine, comprehensive emergency care was uncommon, and unsupervised junior residents made all patient care decisions

during the night [170]. Recognition of the need for around-the-clock coverage of emergency rooms by permanently assigned physicians trained in immediate care of the sick and injured, led to the birth of emergency medicine and the evolution of "emergency departments". Professional colleges of emergency physicians began to develop around the world beginning in the late 1960s, and by the 1980s emergency medicine and emergency nursing were recognized as specialities in the United States and Canada.

Over the past 40 years, the structure and care provided in EDs has undergone a revolution. EDs have evolved into sites for stabilization of critically ill or injured patients, for clinical investigation of the undifferentiated patient, and the portal of entry for the ill and injured into the hospital system [171]. EDs provide access to health care for all, and emergency physicians are the only continuously accessible medical speciality for patients seeking "help and solace in the health care system" [161, p. 351].

> The spectrum of complaints encountered in an urban emergency facility is all-encompassing. The mix of peoples of vastly different backgrounds, the fervid life of the city, and the telescoping of all conceivable socioeconomic difficulties into a small geographical area conspire to make the emergency department experience rich but unnerving in its complexity [172, p. 86].

Now, at the beginning of the 21st-century, urban hospital EDs are overcrowded [173–178], and bear the dubious distinction as sites of the highest

proportion of "preventable" patient harm [50, 52, 54, 179].

2.2 The Problem: Patient Harm

The safety elephant is in the house, size unknown. Estimates of the burden of patient harm vary widely. Much as the six blind men in the ancient Hindu parable, there has been considerable effort to understand the entity of patient harm, and yet, our tools are inadequate, and our vision limited. In this section, I provide an overview of the epidemiology of injury related to healthcare delivery. The most common research strategy used to characterize the problem of patient harm is the retrospective chart review. I point out what we have learned from this strategy, as well as its limitations. I then review and compare alternate strategies and their limitations.

Studies of iatrogenic injury began in the mid-20th-century [180–186], but it was not until the Harvard Medical Practice Study (HMPS) [50, 51, 187–190] in 1984 that a large systematic population-based study on iatrogenic complications was performed. Even then, the HMPS was intended to study tort reform, not patient safety. Despite a long history of evidence that healthcare was a threat to health [191, 192], and a source of harm[1], it has not been until the past decade that the endemic problem of patient injury related to the delivery of care has garnered widespread attention [11], and is now established as a global healthcare and health policy issue [193]. Hospitals, and particularly the complex bureaucratic institutions of

[1] Code of Hammurabi circa 1700 BCE

modern hospitals, have never been safe from the threat of patient harm, not now, and likely never.

2.2.1 The Tipping Point: *To Err is Human*

The past decade has seen unprecedented public, government, academic, and practitioner interest in patient safety. A decade ago, the Institute of Medicine (IOM) Committee on Quality Health Care in America released a groundbreaking policy document on medical injury entitled *To Err is Human: Building a Safer Health System* [11] that proved to be the tipping point, forcing patient safety onto the policy agenda of many industrialized countries.

To Err is Human cited findings from the HMPS [50, 51, 187–190] and the Utah Colorado Medical Practice Study (UTCOS) [54] and extrapolated the estimates of "preventable" patient harm to the over 33 million hospital admissions in the US in 1997 to suggest that between 44 000 and 98 000 patients die each year in the US "as a result of medical errors". This estimate of patient harm ranks "death due to medical error" as between the 5th- and 8th-leading cause of death in the US.

The report was a rhetorical blockbuster that changed the conversation [194]. No medical publishing event since the Flexner Report of 1910 has generated more reaction and alarm [195]. A flurry of political, policy, and research activity immediately followed the release of *To Err is Human*, both in the US and internationally [196–198]. In Canada, the Canadian Patient

Safety Institute was established in 2003 with funding from Health Canada, and a national mandate "to build and advance a safer healthcare system for Canadians". In emergency medicine, the American College of Emergency Physicians and the Society for Academic Emergency Medicine both set up task forces to develop strategies to address safety in emergency care, and the first Society for Academic Emergency Medicine consensus conference was devoted to the problem of safety in emergency medicine [6, 70, 160, 199–203].

However, the main message of the report, that "safety is a system issue" and "does not reside in a person, device or department, but emerges from the interactions of components of a system" [11, p. 57], has unfortunately been obscured by the focus on "medical error" [6, 8–10, 204, 205]. The unreconciled tension in *To Err is Human* is the emphasis on human "error", and the attendant bias towards the individual practitioner [205]. In contrast to the social science it draws on [206, 207], *To Err is Human* suggests that human "error" is the overwhelming contributor to adverse events [11, p. 53], and fails to explain how the system, whose elements are coupled and interdependent, is to be transformed primarily through actions carried out by intentional individuals [205]. The authors of the report appear to have missed the point of Perrow's argument, which is "if, as we shall see time and time again, the operator is confronted by unexpected and usually mysterious interactions among failures, saying that he or she should have zigged rather than zagged is possible only after the

fact" [206, p. 9]. Thus, human "error" is not an explanation; it demands an explanation [56, 149].

2.2.2 Retrospective Chart Review

In the decades following publication of the HMPS, numerous groups of investigators from around the world have utilized a similar two-stage chart review process from either a random or total sample of non-selected patients in one or multiple hospitals to estimate adverse outcome occurrence and mortality in hospitalized patients [208, 209], including investigators in other regions of the United States [53, 54, 210–212], Australia [52], the United Kingdom [86, 213, 214], Denmark [215], New Zealand [216, 217], France [218], Canada [55, 93], Spain [219, 220], Brazil [221], Sweden [222], and the Netherlands [223, 224].

Estimates of the proportion of annual hospital admissions associated with one or more adverse events (AEs) range from 2.9 percent (95% CI, 2.6% to 3.2%) [53] to 16.6 percent (95% CI, 15.2% to 17.9%) [52], with lower estimates found in studies conducted from a more stringent medico-legal perspective where the emphasis was on "negligence" [50, 51, 53], and higher estimates found in studies conducted from a quality improvement perspective where the emphasis was on "preventability" [52, 55, 93, 210, 213–216, 218, 219, 221, 222, 224]. Similarly, estimates of the incidence of "negligent" or "preventable" AEs range from 1.0 percent (95% CI, 0.8% to 1.2%) [50] to 8.6 percent (95% CI, 7.4% to 9.8%) [222], and estimates

of the proportion of "preventable" AEs range from 27.6 percent (95% CI, 22.5% to 32.6%) [50] to 70.1 percent (95% CI, 64.3% to 75.9%) [222], again with lower estimates found where the emphasis was on "negligence", and higher estimates found where the emphasis was on "preventability".

Globally, between 1984 and 2006, over 85 000 hospital charts from more than 180 hospitals in eleven different national healthcare systems have been systematically reviewed for iatrogenic injuries [219]. On average, an AE is detected in the medical record of approximately 10 percent of patients admitted to hospital per year, with approximately half of these AEs judged to be "preventable" adverse events (PAEs).

EDs have been identified as the location of the highest proportion of PAEs [50–55], although ED care accounts for less than 5 percent of AEs detected on hospital charts [51, 52, 54, 55, 186, 209, 221]. In comparison, "ambulatory care preventable adverse events" (APAE) occur most commonly in physicians' offices (43.1 percent), and EDs (32.3 percent), but also at home (13.1 percent) and in day surgery (7.1 percent), with day surgery events most likely to contribute to patient harm [225].

Preventable adverse events, the category of particular interest, are primarily associated with performance, prevention and diagnostic related tasks [51]. Although the diagnosis category (failure to use indicated tests, failure to act on results or findings, avoidable delay) is associated with the highest proportion of "negligence" (74.7 percent) in the HMPS, higher absolute numbers of performance (technical error, inadequate preparation

or monitoring, avoidable delay) and prevention (failure to take precautions, failure to use indicated tests, failure to act on results or findings, avoidable delay in treatment) related events, albeit considered less "preventable" (28.2 percent and 59.6 percent, respectively), makes these three categories similarly the most common categories of PAEs.

APAEs related to diagnosis and surgery are more common than events related to medication, non-surgical procedures and therapy, but with broad confidence intervals around the point estimate there is no significant difference [225]. Diagnostic related APAEs are the most numerous, and all are categorized as "preventable" in contrast to other categories where between 21 percent (medication) and 85 percent (therapeutic) of events are counted as APAEs.

The majority of ED events are "preventable" diagnostic related events, which is not surprising given the diagnostic nature of emergency medicine. Yet, emergency medicine may have been judged in retrospect by the standards of traditional medicine, that is, whether the precise diagnosis is made [226], and without an understanding of the context and nature of emergency care. Hindsight bias, social attribution, and the lack of emergency physicians as peer reviewers may have contributed to an overestimate of the degree of "preventability".

Limitations

One of the primary limitations of retrospective chart reviews and active surveillance is the associated time and cost required. More significant and problematic, however, is the impact of reviewer perception and retrospective judgement on the estimated rate of PAEs [57, 208, 227, 228], which can be understood, in part, as an effect of hindsight bias [137, 229–232], and the social construction of risk [233, 234].

Direct comparison of the UTCOS [54] and the Quality in Australian Health Care Study (QAHCS) [52] allows for an international and methodological comparison of the chart review strategy for detecting iatrogenic injury [211, 228]. Both studies utilized the 2-stage chart review strategy of the HMPS [50, 51, 235], and used the same definition of an AE.[2]

The five-fold difference between studies in the estimate of the incidence of AEs, can in part be accounted for by methodological differences. When the Australian data are analyzed using the UTCOS methods, the comparative rates of AEs become 10.6 percent and 3.2 percent, respectively [211]. Hence, the five-fold difference is reduced to a three-fold difference simply by using the same explicit methods. Further qualitative comparison suggests that both studies detected a similar core of AEs, accounting for two-thirds (67 percent) of the UTCOS AEs and almost one-third (28 percent) of the QAHCS AEs. There are no statistical differences between

[2] "An unintended injury or harm to a patient, caused by healthcare management rather than a disease process, which contributed to hospitalization, prolonged hospitalization, morbidity at discharge or death" [54, p. 372]

studies across these categories. In contrast, there are six to seven times more minor AEs in the Australian data compared to the American data, and three times more AEs overall [228]. This bi-modal pattern suggests that reviewer behaviour or perception of what counts as an AE may underly the 3-fold discrepancy between studies.

That the discrepancy lies in part in the eye of the beholder [57] is not surprising considering the differing perspectives of the studies. The UTCOS was designed to compare the cost of a "no-fault" insurance system with that of the tort system, whereas the QAHCS was designed to assess the overall impact of AEs on a universal healthcare system. The American reviewers were aware that exposure to litigation and claims for compensation were being assessed, while the Australian reviewers were aware that the study was intended to estimate the burden of AEs on the system. Hence, the US reviewers were more likely to have been biased away from "detecting" an AE, while the Australian reviewers were more likely to have been biased towards "detecting" an AE. Despite using the same outcome definition, differences in interpretation and application of a similar method accounts for much of the discrepancy in results.

The other significant limitation of the retrospective chart review strategy for estimating the burden of patient harm in EDs, is that the majority of patients cared for in an ED are discharged home, and therefore are not represented in these in-hospital studies.

2.2.3 Alternate Strategies

Given these limitations of retrospective hospital chart review, multiple other strategies have been used to describe and estimate the burden of patient harm related to emergency care delivery.

Closed claims

Emergency medicine is a specialty at high risk of litigation [236], where most malpractice risk is related to "failure to diagnose" [237]. Wounds (19.9 percent) and fractures (17.7 percent) account for the largest proportion of claims, although missed myocardial infarction accounts for the largest single payout category (25.5 percent) and the only category where the proportion with indemnity payment was greater than the proportion without indemnity payment [238].

The majority (65 percent) of cases identified on closed claims analysis involve missed ED diagnoses associated with patient harm [239]. Almost half of these missed diagnosis claims (48 percent) were associated with patient harm, and 39 percent were associated with death. The main "breakdowns" attributed to failure of diagnosis were failure to order an "appropriate" diagnostic test (58 percent), failure to perform an "adequate" medical history or physical exam (42 percent), "incorrect" interpretation of a diagnostic test (37 percent), and failure to order an "appropriate" consultation (33 percent). The leading factors contributing to the missed diagnoses were judged to be cognitive factors (96 percent), patient-related factors (34

percent), lack of appropriate supervision (30 percent), inadequate handoffs (24 percent), and excessive workload (23 percent), with most claims associated with more than one breakdown and contributing factor [239].

Sentinel Events

Hospital EDs have also been identified as the source of the majority (53 percent) of sentinel event cases of patient death or permanent injury due to delays in treatment [240]. Reported reasons for delay were varied, with the most common being misdiagnosis (42 percent), delayed results (15 percent), physician availability (13 percent), delayed administration of ordered care (13 percent), and incomplete treatment (11 percent). Most common among the multiple cited "root causes" was a breakdown in communication (84 percent), and most often with or between physicians (67 percent). In addition, concerns about patient assessment processes (75 percent) and continuity of care (62 percent) were cited in more than half of cases. The most commonly cited systemic "root causes" among the ED cases include staffing (34 percent), overcrowding (31 percent), and availability of consultants (21 percent).

Unscheduled return visits: "Bouncebacks"

Unscheduled returns within 72 hours are commonly used as an ED quality care indicator [201, 241, 242] based on evidence that upwards of 40 percent of patients who make unscheduled return visits within 72 hours do so for avoidable reasons, including "deficiencies" in medical management, pre-

scribed followup, patient education or patient compliance [243]. An unscheduled return visit or "bounce" rate of 3 percent, of which 10 percent were considered to be related to "error" in diagnosis, treatment or disposition, and more likely to require hospitalization, has been estimated using 48 hours as the criterion [244]. Based on hospital registration data, admission to hospital on 72-hour return visits occurs in approximately 0.5 percent of cases, although patients who presented elsewhere within 72 hours were not included [245].

Unanticipated death after discharge

Findings from a 10-year retrospective cohort of patients discharged home from an urban, tertiary-care, Level I trauma ED derived by probabilistic linkage of three databases [246], suggest a rate of unanticipated death within one week of ED discharge almost three times higher than previously estimated using retrospective review of medical examiner cases [247]. Rate estimates suggest 15.0 unexpected but related deaths within 7 days per 100 000 discharges home (95% CI, 11.6 to 19.4), and 9.0 unexpected but possibly error related deaths within 7 days per 100 000 discharges home (95% CI, 6.5 to 12.6).

In addition, four main themes were identified using a grounded theory approach to identify commonalities among the cases [246]: atypical presentation of an unusual problem; decompensation of chronic disease; mental disability, psychiatric problem or substance use that may have af-

fected return to the ED; and abnormal vital signs. Abnormal vital signs, particularly tachycardia, were documented on 71 percent of potential patient safety events leading to death within 7 days of ED discharge. The difference between studies is likely related to more complete case finding using the linked database approach, although even this approach possibly would have missed cases from jurisdictions outside of the database. Estimates of unexpected death related to potential patient safety incidents are also limited by chart review and retrospective knowledge of fatal outcome and comorbidity, and are interpreted with caution.

Telephone Followup

Multi-wave telephone followup suggests that the majority of patients (88 percent) receiving ED care are satisfied and perceive their care to be safe [248]. However, 38 percent (95% CI, 35% to 41%) of patients in this sample expressed concern about a specific threat to safety during their care. Almost one-quarter of all patients (22 percent; 95% CI, 19% to 25%) reported they were concerned about misdiagnosis. Concerns about medication errors (16 percent), mistakes by physicians (16 percent) and mistakes by nurses (12 percent) were not significantly different.

Prospective study of 399 patients discharged home from an ED, detected an AE in 6 percent (95% CI, 4% to 9%), of which 71 percent were considered "preventable" (PAE incidence of 4 percent (95% CI, 3% to 7%) [249]. Outcomes were determined using a combination of implicit physi-

cian chart review and telephone follow-up. Adverse outcomes were considered to have occurred following discharge if patients had new or worsening symptoms, visited an ED, were admitted to hospital, or died. A single reviewer summarized all "adverse outcomes" using information from chart review, telephone interview, and any additional information from follow-up visits or hospitalizations.

The majority of AEs (63 percent; 95% CI, 43% to 77%) led to an additional ED visit or hospitalization. Judgements of "preventability" were focused on the "holistic" functioning of the healthcare system [249, p. 21]. Hence, if arrangements for follow-up were not carried through, this was judged as an "error". Too, diagnostic "errors", management "errors", "unsafe" disposition decisions or inadequate follow-up were classified as "preventable", whereas events related to medication side-effects and procedural complications were considered "non-preventable", and although examples were given, no other explication or justification for these determinations was provided.

Prompted reporting

Several studies have attempted to improve upon voluntary incident reporting by prompting physicians, nurses or pharmacists to report errors or adverse events. Not surprisingly, reminding providers to report improved the rate of reporting, and the number of reports increased with the intensity of reminders (daily versus weekly) [250]. In a concurrent com-

parison, prompted reporting was as effective in detecting adverse events as chart review, but less than half of the cases overlapped [251], suggesting that neither method alone is adequate for detection.

Most reported errors with active solicitation of ED care providers and staff over a 1-week period at a 600-bed academic, tertiary care ED were low risk incidents such as incorrect documentation, misplacing paperwork, and mislabelling specimens [252]. Eighteen "errors" in emergency care were reported per 100 registered patients, and 2 percent of these "errors", including incorrect medication administration and incorrect performance of resuscitation procedures, were associated with patient harm. This equates to a patient injury rate of 3.6 patients per 1000. Interestingly, during the week long study period, seven incident reports related to "error" were filed, three of which were not elicited by the researchers.

Structured observation

Ethnographic observation of provider discussions during rounds, shift changes, case conferences, and meetings on in-patient surgical units at a large, tertiary care, urban teaching hospital, detected an adverse event rate of 17.7 percent (95% CI, 15.4% to 20.0%) [253]. Physicians and nurses were noted to "candidly discuss adverse events in patient care at work rounds and clinical meetings" [253, p. 312]. The major attribution of cause was to individuals (37.8 percent), whereas 25.4 percent of AEs were attributed to interactions or administrative issues such as staffing or equipment. Cen-

tral to the categorization is the sensemaking of providers on the causes of patient harm, which in turn reflects their accident models [see Section 2.5.1].

Ethnographic fieldwork over 30 months in two EDs in the UK revealed several active and latent failures in ED care [254]. The active failures involved delay, failure to obtain or misinterpretation of diagnostic information, and inappropriate treatment. Underlying these active failures were latent conditions considered to be patients' unrestricted access to the ED, individual cognitive "errors" by staff, and strict horizontal and vertical division of labour. The seven critical incidents related to the division of labour were analysed in detail noting the demarcation between professions, and between levels of seniority within professions [255].

All incidents revealed a tension between the need to work flexibly and the rigidity of the division of labour. The culture of the wards had penetrated the ED [256], "importing a foreign framework of cultural beliefs that affect the decision making and action at the local level" [254, p. 89]. In the majority of incidents, collaboration from another profession or a senior member of the same profession, was required, but hindered by established patterns of deferring to formal authority. Rather than administrative control, Boreham et al. [254] argue that risk could be reduced if providers recognized the "sapiential authority"[3] of "ground knowledge" that contributes to collective competence. Although one case suggested

[3]Authority based on practical wisdom rather than hierarchy

that deferral to sapiential authority may not always protect against failure, it remains that collective competence and "heedful interrelating" [140] may have prevented these patient safety incidents.

Quasi-experimental Intervention

Implementation of a teamwork training curriculum and creation of a team-based staffing pattern comprised of physician-nurse-technician teams significantly reduced the mean observed "clinical error"[4] rate from 30.9 to 4.4 percent in the intervention group compared to the control group (16.8 to 12.1 percent, p=0.039) [257]. Teamwork changes, including physical changes to workspaces and layout to eliminate barriers separating nursing and medical staff, were considered valuable by staff; points of resistance included the wearing of team identifiers and the designation of physicians as team leaders. The individual role performing specific leadership functions was less important than that clinical and operational management information was exchanged among physician and nurse leaders. Although this evidence suggests that ED teamwork behaviours are amenable to intervention, the impact on patient safety is less certain without knowing the background variability in the observed "error" rate in both the experimental and control groups.

[4]Defined as "any clinical task that actually or potentially put a patient at risk" [257, p. 1559]

Summary

The potpourri of research strategies to quantify the burden of patient harm results in widely varying estimates. In an ED with an annual census of 60 000 patient visits, the number of patients harmed might range from approximately 200[5] [252] to 5400[6] [249]. This 27-fold difference suggests that the effort to count and classify "error" and patient harm may be an example of the *What-You-Look-For-Is-What-You-Find* or the *WYLFIWYF* principle [59].

2.3 Patient Safety in Emergency Departments

Hospital EDs are unique operating environments. An ED stands alone, its red sign a beacon in the night, an open door that never closes. All in need are welcome, however they arrive, whenever day or night, whoever they might be, from wherever they come, with whatever concern they might have [60]. There is no schedule or appointments, there are no caps or quotas, and historically, "the ED is the only infinitely expansible part of the hospital" [cited in 160]. All of humanity comes; some have no where else to go. Many are unknown, their visit unexpected, even undesired. Some are unstable or uncooperative. They all arrive in suffering, with injuries, illness, and social problems for which there often is no easy cure. For a few, they seek the basic necessities of shelter and food, and for a time, a

[5]Estimate of patient harm of 2 percent of 18 "errors" per 100 patient visits [252]
[6]Upper confidence limit estimate of patient harm of 9 percent [249]

sanctuary. All come, all go, be it in moments or days. No one stays. Everyone is passing through on a journey. Often overcrowded, rarely quiet, and almost never empty, an ED continues on in perpetual dynamic interaction.

Hence, it should not surprise that EDs are crowded, chaotic, and complex, high-risk healthcare environments that pose a threat to patient safety [46, 47, 258]. Several aspects of hospital emergency care, including care of multiple acutely ill or injured patients of varying severity, overcrowding, multiple interruptions, and uncertain or incomplete information, suggest that emergency care may be particularly vulnerable to unintentional unsafe acts [46, 258]. The level of decision density, cognitive and emotional load, uneven and abbreviated care, shift work and transitions, sleep deprivation and limited breaks further contribute to the difficulty of delivering care in the ED [47]. Increasing patient waiting time and the delivery of care in hallways and waiting rooms lends evidence to resource limitations, overcrowding, and unmatched demand [45]. Surge and overcapacity threaten patient safety through distractions, interruptions, multiple competing demands [47, 63, 70] and trade-offs [59, 259].

EDs operate at the liminal interface between the "rear guard" of the hospital and the hostile "world" of injury, illness and infection [260]. They are the "canary in the mine shaft" of the healthcare system, unique as a complex and difficult healthcare settings in which to provide care [see Table 2.1] [261], and a "natural laboratory for the study of error" [148].

Characteristic	Comment
unbounded	no upper bound to the demand for care
multiplicity	concurrent care to a population of patients with variable acuity and complexity of complaints
uncertainty	fundamental aspect of providing care to undifferentiated patients
time constraints	production pressures to see and discharge patients force trade-offs; small window of opportunity for successful action in acute, life-threatening scenarios
feedback	routine outcome feedback is rare
opportunity for practice	limited opportunity to practice critical procedures

Table 2.1: Characteristics of an ED operating environment

Adding to these six department-level characteristics are personnel factors (shift work and sleep deprivation) and system-level factors (staffing and interdependence on supporting services laboratory, imaging, and consulting services) that contribute to a dynamic that creates the potential for novel and unexpected system interactions [261].

2.3.1 Vulnerabilities in Emergency Care

Taking these threats to safety as a starting point, I turn now to briefly explore issues related to the major themes of patient safety in the ED: capacity (flow, surge, overcrowding), cognition (diagnostic "error"), communication (interruptions), and collaboration (teamwork and transitions).

Capacity

I begin with capacity. In the decade between 1993 and 2003, the population in the United States increased by 12 percent, hospital admissions increased by 13 percent, but ED visits increased 26 percent, even as the number of EDs across the country decreased. This confluence of increasing demand and decreasing supply, in concert with access block, led to overcrowding, boarded inpatients, ambulance diversions, and almost 2 million patients who left without being seen [45]. This situation leaves little to no reserve for surge capacity or disaster preparedness, contributes to delays in treatment [178, 262], and probably contributes to patient harm [263, 264]. EDs are at "the breaking point" [45], making capacity or "safe space" [62] arguably the greatest threat to patient safety in urban EDs [265].

Cognition

As noted [see Section 2.2], missed ED diagnoses are associated with patient harm [50–55], and are a significant medical-legal risk [237–239]. However, the ambiguous designation of "missed or delayed diagnosis" requires the use of retrospective judgment. "Error" is often judged as the result of simple chains of events, but redundancy and codependencies are prevalent in complex systems [266]. Diagnostic "error" is generally viewed as an individual cognitive failure [156, 203, 259, 267–273], and uncommonly viewed as a system problem [274–276], even though diagnosis is more a problem of situated perception and sense making [43, 232, 277–

279], and failures do not neatly fit into "cognitive" versus "system" [276].

Individual risk perception cannot be studied in isolation from the social world because risks are socially embedded, and may be "exaggerated or minimized according to the social, cultural, and moral acceptability of the underlying activities" [280–282]. Risk perceptions are therefore embedded in social discourse, and strategic rationality has social origins [283, 284]. Only through social interactions do standards for reason develop, and particularly when reasoning is dependent on the choices of other actors. It is not possible, therefore, to determine if a person is acting rationally without knowing their social situation. Rationality assumptions must pay attention to social context and tacit knowledge.

Theories of decision-making based on individual volition are inadequate to explain the social embeddedness of practice. Viewing action as a individual calculative act fails to account for the social and habitual character of everyday practice. Actions are always situated in context, and therefore are impossible to understand without that context. Hence, we must be careful when attributing cognitive processes to individuals who are engaged in cultural practices, for there is a danger of attributing to the individual cognitive properties that belong to the larger distributed system [285]. Risk or safety models based on collective joint action are thus more appropriate to understand interpersonal or group actions.

Communication

Good communication is an essential part of teamwork and patient safety [65, 286–288]. Communication failures are the leading "root cause" of sentinel events reported to The Joint Commission [289, 290], and the leading cause reported on retrospective review of in-hospital deaths [52].

Communication patterns and load in EDs has been studied across sites in three different countries with similar findings [see Table 2.2]. Communication in the ED can be chaotic [63–65, 68], with multiple interruptions [70], transitions [291, 292], limited feedback [202, 293, 294], and communication overload. Hence, the potential for threats to patient safety from communication errors in the ED is high.

Explicitness and efficiency are two of Grice's maxims of communication [295] — be clear, and say only as much as necessary to convey the message — with higher levels of explicitness required among three people than between two people [296]. However, effective team communication is more than timely and accurate transmission of information. Healthcare teams are socially constructed groups situated at the intersection of multiple institutional and professional cultures.

Hence, examination of communication in healthcare teams must look at both communication and the evolving context, and consider strategies that promote shared situational awareness and support distributed action [297, p. 19]. Hence, communication and collaboration are intertwined.

Reference	Setting & Participants	Observation	Events	Communication Load
Coiera et al. [63]	2 EDs: rural & urban tertiary teaching, NSW; Jun-Jul 1999; nurses(6), physicians(6)	35h13m; morning, afternoon, evening, weekday; observer training not defined	1286 events; 36.5 events per person per hour (95% CI, 34.5-38.5); medical staff 33.6 events per hour (95% CI, 31.0-36.2); nursing staff 39.8 events per hour (95% CI, 36.7-42.8)	28h12m (0.80); medical staff (0.79), nursing staff (0.82)
Spencer et al. [64]	urban teaching, NSW, Jul-Sep 2001; nurses(4): 2 senior, 2 bedside; physicians(4): 2 registrars, 2 learners	19h52m; morning, afternoon, night; clinically trained observer	831 events, 42 events per person per hour	17h40m (0.89)
Fairbanks et al. [66]	university tertiary regional trauma centre, 93350 census 2005; Apr-May 2005; 20, 10 adult, 10 pediatric: 2 attending, 2 R3, 2 residents, 2 bedside, 2 charge	39h12m; 15 day, 5 evening; nonclinical RA, paper data collection form; 8h familiarization	1665 events, 1423 for analysis, 49 events per hour	28h51m (0.74)
Woloshynowych et al. [68]	inner-city, London UK, 113000 census, CDU; Jan-Jun 2005; 11 charge nurses	20h, 9-6 weekdays; nonclinical RA	2019 events, 100.9 events per hour, 1.68 events per minute	

Table 2.2: Summary of communication studies in an emergency department

Collaboration

Collaboration literally means to "labour together", and is at the heart of effective joint action. Two key aspects and challenges of collaborative care are transitions and team coordination. Transitions in care, or handoffs, are a significant understudied threat to patient safety [298–300]. Every ED patient experiences multiple transitions between providers and staff over time and space. In addition, continuous 24/7/365 operation dictates that handoffs between care providers are a routine and vulnerable part of everyday practice in emergency care. Thus the need to make transitions robust for safety.

Transitions involve much more than monologic information transfer; they also include a transfer of control or responsibility [301], and present opportunities for sensemaking and resilience [302]. In addition, the distributed and uncertain nature of emergency care calls for flexibility in structuredness and degree of interaction at transition points [303].

2.4 The Overarching Strategy: 'Safety Culture'

The safety of patient care presents one of the greatest challenges for a modern healthcare organization (HCO) [193]. The widespread and persistent problem of preventable patient harm, seen across settings, units, hospitals, and healthcare systems around the globe, suggests that patient safety is threatened by some fundamental aspect of the organization and delivery of healthcare — 'safety culture'. In response, the management of patient

safety is now a policy priority for many local, national, and international HCOs, with the key message from these initiatives focused on building a culture of safety [11, 197, 304–308].

The concept of 'safety culture' comes from anthropology by way of the nuclear industry. A poor 'safety culture' was first documented in the summary analysis of the nuclear accident at Chernobyl in 1986 [155, 309, 310]. In the wake of Three Mile Island and Chernobyl came the realization that technical and human factors are not adequate to explain complex socio-technical accidents [206, 311]. It was the realization that organizational and cultural factors underlay these disasters that led the International Nuclear Safety Advisory Group (INSAG) to introduce the term 'safety culture' to represent the management and organizational factors that are relevant to safe nuclear plant operation [312]. INSAG has since developed the term to describe:

> ...that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance [313, p. 1].

However, the problem with INSAG's approach is that it assumes a relationship between 'safety culture' and human performance or safe operational performance, and offers no theoretical or empirical foundation for the concept [314]. Moreover, a decade following Chernobyl, attempts to

understand the relationship between 'safety culture' and organizational outcomes were "unsystematic, fragmented, and in particular underspecified in theoretical terms," [315][as cited in 155, p. 203] and even now "culture is an actively contested concept; its importation into organizational and engineering analyses is equally contentious" [316, p. 350]. Yet, despite confusion [157], and in danger of becoming meaningless [156, 309], 'safety culture' is now ubiquitous in studies of risk and safety in high hazard industries [83].

'Culture' became part of management lexicon in the post-1960s era [317, 318], but it was largely a reductive and oversimplified concept of culture that took hold, with "strong tendencies to reify, essentialize, unify, idealize, consensualize, totalize, and otherize" [319, p. 186]. Schein notes that:

> any social unit that has some kind of shared history will have evolved a culture, with the strength of the culture dependent on the length of its existence, the stability of the group's membership, and the emotional intensity of the actual historical experiences they have shared [320, p. 11]

and defines organizational culture as:

> a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be consid-

> ered valid and, therefore, to be taught to new members as the way to perceive, think, and feel in relation to those problems [320, p. 17]

However, 'culture' is an abstraction [320] that has no fixed or generally agreed upon meaning, even in anthropology [321]. Taking a more socio-anthropological view on culture points to an emphasis on meaning and mutability as "ways of life", "maps of meaning", "systems of signification", and "habits and norms" [322, p. 156]. Organizational culture then is the set of artifacts, values and assumptions that emerge from the interactions of organizational members [320, 323]. Culture in this view is never singular, naturally given, or neutral, but rather is considered as a dynamic context-dependent process of interaction that reproduces meaning and patterns of behaviour which are re-articulated in plural, fragmented, and diverse ways through social relations and contestations within intellectual, political and economic arenas that reflect and reproduce dominant beliefs and values [324, 325][cited in 326]. Hence, culture is fundamentally relational, and always an effect of relational power [327, 328] best modified through changes in social practice. Culture is generated through socio-spatial relationship within an interacting community, where integrated patterns and spaces that intersect at a particular time and place are uniquely imbued with meaning [329].

Organizational culture supplies a shared way of knowing which gives meaning to and is revealed in practice. Culture facilitates shared inter-

pretations of situations and renders coordinated action and interaction possible and meaningful [319]. Culture both enables and constrains. Although the dominant perspective is one of unity and consistency, culture may also be viewed as inconsistent, conflicted, contested, and ambiguous [330]. Multiple cultures may serve a useful purpose, as they provide a diversity of perspectives and interpretation of emerging problems in safety [155].

The belief that organizations that develop and maintain a strong 'safety culture' are more effective at preventing accidents underlies the prominence of the concept, despite confusion about what 'safety culture' is[7] or how it can be "measured and managed" [19, 136, 151, 314, 316, 332–334, 334–348].

One widely used definition from the 3rd Report of the Advisory Committee on the Safety of Nuclear Installations and published by the Health and Safety Commission (of Great Britain) describes the 'safety culture' of an organization as:

> The product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization's health and safety management. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the impor-

[7] Weigmann et al. [331] identified thirty published definitions

> tance of safety, and by confidence in the efficacy of preventive measures. [349, p. 23]

This is the definition that has been appropriated almost intact in health care [350, p. ii18], without any apparent consideration for the potential difference between nuclear power and health care. Central to this definition is the patterns of collective action founded in mutual trust and shared values that impact safety. Perhaps the most widely used characteristic of 'safety culture' is the concept of an informed culture, one in which group and organizational members at all levels do not forget to be afraid [83, 351]. Reason [83] goes on to suggest that an informed culture is made up of a reporting culture (trust and commitment), a just culture (clear line between acceptable and unacceptable), a learning culture (will and competence to learn and change), and a flexible culture (effective adaptation), to which Hudson [351] adds the dimension of wariness. An additional four characteristics were suggested by Ek [352], including working situation, communication, attitudes towards safety, and safety-related behaviours, whereas Piers, Montijn, & Balk [353] reduce their framework to six characteristics: commitment, behaviour, awareness, adaptability, information, and justness.

In healthcare, the Manchester Patient Safety Framework (MaPSaF) [354–356] is a facilitative self-reflective group education tool based on Westrum's [357–359] model of information flow in organizations. Westrum described three levels of organizational culture — pathological, calculative, and gen-

erative — to which Reason [151] added reactive and proactive to create a five-level model. Adaptation of the framework [341, 360] to healthcare began with interviews with opinion leaders from primary care organizations [355], who corroborated nine dimensions of patient safety identified from a review of the literature [see Table 2.3].

Overall commitment to quality
Priority given to patient safety
Perceptions of the causes of patient safety incidents and their identification
Investigating patient safety incidents
Organizational learning following a patient safety incident
Communication about safety issues
Personnel management and patient safety issues
Staff education and training about safety issues
Team working around safety issues

Table 2.3: Dimensions of patient safety

Put succinctly, creating safety is about "making the unthinkable cognizable and the invisible apparent" [316, p. 361]. For some, 'safety culture' is measurable, and "determine(s) the commitment to, and the style and proficiency of, an organization's health and safety programs" [151, p. 194]. For others, the mechanism that shapes safe outcomes is underspecified, with much of the management and engineering literature debating how to operationalize and measure the mechanism and the outcome [316]. As Guldenmund [335] notes, there is a tension between the holistic char-

acteristic of culture, and the reductionistic approach in most (social) psychological research. The debate about whether an organization *is* a culture (interpretive/symbolist/semiotic perspective) or *has* a culture (functionalist perspective) is ongoing.

Safety climate is a social-cognitive construct [361] that is part of collective sensemaking [19, 29], and has recently been defined as a multilevel (unit/group and organizational), multi-climate (safety and work-ownership) framework [362, 363] that relates to shared perceptions with regard to safety policies, procedures, and practices, including explicit and tacit patterns of action concerning safety. Hence, safety climate reflects employee perception of the priority an organization (or direct supervisor) places on safety. This framework suggests that measures of safety climate include tradeoffs between competing priorities as the "acid-test indicators" of managerial commitments [364]. Employees facing both high job demands and low job control are less likely to view improving safety as part of their role orientation [365]. The "safety citizenship"[8] combination of high-safety and high-psychological ownership is considered the most beneficial, particularly in complex organizations whose processes are not routinized, and where safety rules and procedures cannot anticipate all possible contingencies. Safety "citizenship" enhances capacity to cope with uncertainty, and is a basic construct for high reliability [363].

In health care, there are multiple 'safety culture', or more accurately

[8]Orientation toward improving workplace safety

safety climate surveys, that have been adapted from industries outside of health care [350, 366–369]. Most do not specify a theoretical model, and none have robust psychometric properties [16, 367, 370]. The relationship between hospital organizational culture and safety climate is not well understood, but available evidence supports an association between higher levels of safety climate and higher levels of group and entrepreneurial (innovation) culture, and lower levels of safety climate and higher levels of hierarchical culture [371].

Despite confusion, culture matters. It is the milieu in and through which we come to understand ourselves and our relationship to the world. Cultural models frame our understanding of how the world works and influence both how we view patient safety and the actions we take to improve it. Cultural knowledge is instrumental in complexity reduction [372], shaping and narrowing understanding and sensemaking. Stories include norms, "prototypical events, prototypical roles for actors, prototypical entities, and more. They invoke whole worlds in which things work, actors perform, and events unfold in a simplified and wholly expectable manner. These events are chained together by shared assumptions about causality" [373, p. 20].

I understand culture to be emergent and indeterminate, "an indissoluble dialectic of system and practice" [374, p. 164][cited in 316]. Culture is a complex social dynamic that provides a framework for inter-subjective inter-actions. Culture is an adaptive ecological system, an interface be-

tween ourselves and our environment, in which actors, relational networks and translation processes are co-constructed through interactions [375–377].

One necessary element of 'safety culture' is a shared understanding of the current operating point of the system and its relationship to the margin of safety and acceptable performance boundaries [81, 378]. Because of scientific and technical uncertainty, all judgments are made under conditions of imperfect knowledge, so that routine nonconformity is a normal by-product of techno-scientific work [136, p. 279]. Normal work usually leads to success and safety. Thus, safety is an emergent property of the ways in which humans work within sociotechnical systems [379], and how they create the setting in which both failure and success occur. Therefore, safety begins with efforts to understand the sources of failure AND success [81, 378].

2.4.1 Safety Learning

Central elements of 'culture' are sharing and learning in the co-creation of knowing. The literature of organizational learning encompasses two perspectives: one cognitive, based on psychology and individual learning — rationalist; and the second, a social perspective, based on sociology and social learning — relational. It is common to think of learning in organizations as a form of knowledge acquisition and to relate it to instruction and training. From this "banking model" perspective [380], learning amounts

to the acquisition of data "out there" to be acquired and stored in the "container/compartment" of the mind, implying a separation between actor and context [381].

An alternate perspective presents the image of learners as social beings who construct their understandings and learn from social interaction within specific socio-cultural settings [118, 382–386]. Learning is viewed as the historical production, transformation and change of people: learning is no longer equated with simple appropriation or acquisition, but is "understood as the development of a new identity based on participation in the system of situated practices" [381, p. 193]. Learning is thus conceived as a way of taking part in a social process mediated by artifacts, not as a cognitive way of coming to know.

Situated learning theory is the basis of a community of practice. Lave and Wegner [385] developed the concept of the community of practice (CoP) as a "set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice" [385, p. 98]. The central tenant of the CoP concept is that learning is fundamentally a participative social process that takes place within a community of practitioners. These ideas are further enriched by views of power [387], by emphasis on networks of human and non-human 'actants' [388–390], by activity theory [116, 382], and by looking to the transformational nature of collaborative endeavours [391]. In this approach, knowledge has the following characteristics: it is situated in the system of

ongoing practices, it is relational and mediated by artifacts, it is dynamic and provisional, it is always rooted in a context of interaction, and it is acquired through some form of participation [392].

When human agents try to make sense of what is happening, they begin from some place, perspective, or viewpoint — their *habitus* [393]. Frames can be expressed in stories, maps, diagrams, scripts, schemas or other meaningful forms. Frames shape and define relevant data [394]. Perception is enacted [113, 395, 396]. What we see depends on how we look [397]. Schema guide perception and inference [398], and assign significance and meaning. Fragments of data are assembled into meaningful chunks or patterns, and sense is made through knowing-in-action from an interplay between tacit AND explicit dimensions [399, 400]. A frame is a hypothesis about the connections (pattern) in the data. Options for data that do not fit the current frame include elaborating or preserving the frame (explain away the data), or seeking an alternate frame (reframing). Hence, data mandates frame adjustment or change. The basic sensemaking act is data-frame symbiosis [401].

Sensemaking

The Data/Frame theory of sensemaking [401, 402] suggests that early consideration of a hypothesis (rapid frame recognition) permits both more efficient data gathering and more specific expectancies which prompt adjustment or reframing if violated. Effective problem solvers differ from

other approaches by using diagnostic frames to interpret clinical data, but remaining willing to discard them when confronted with disconfirming data (reframing when the data no longer fit the frame) [403]. Hence, it was through exploring new diagnoses — "what else could this be?" [404, 405] — and testing ones already under consideration that good performance was achieved. Whether this was a conscious cognitive forcing strategy of Popperian falsification [406] or metacognition [203, 269] is not known.

Sensemaking "on-the-fly" takes place in parallel with evolving operational action [407]. High reliability organizations are marked by a reasonably accurate, precise, and shared understanding about current operations and the relationship between the current "state" and the potential for failure [81]. Shared (social) sensemaking creates and nourishes common awareness and understanding of the "operating point", and in so doing facilitates coordination and safer performance. "Cooperative conditioning" [408][cited in 407] arises through opportunities for dialogic sensemaking, and increases the likelihood that shared understanding appropriately matches current and evolving conditions. This is an essential condition for the emergence of safety.

Knowing

The concept and definition of "knowledge" is complex and disputed, for "knowledge" embodies a wide range of meanings and attributes that have been debated for millennia [409]. The Greeks, for example, distinguished

between valid information (*eidos*) and opinions or beliefs (*doxa*), truth (*noesis*) from perception (*pistis*), abstractions (*episteme*) from practical skills (*techne*), political and social savy (*phronesis*) from cunning (*metis*). To both Plato and Aristotle, *phronesis* is the meta-virtue. The process of clinical reasoning and the discipline of clinical medicine are often construed as *techne* (art), as *episteme* (science), or as an amalgam or composite of *techne* and *episteme*. Although dimensions of process and discipline are appropriately described in these terms, *phronesis* (practical reasoning) provides the most compelling paradigm, for knowledge exercised in the care of patients is a matter of narrative, practical reason [410].

> In the capacity of a "remembering in forward direction" storytelling might prepare for the activation of preparedness, and because narrative is able to express a normative stance or the conflict between norms, it is subject to practical wisdom. That storytelling and dialogue used together could create awareness of the character of coming events can hardly be denied in so far as these stories and these dialogues are initiated in freedom and from the bottom [411, p. 105]

Reporting systems

Incident reporting is considered by many to be a core facet of patient safety. Five of the nine key recommendations from the IOM's report *To Err is Human* [11] are directly or indirectly about reporting systems. In princi-

ple, reporting systems are intended to help organizations learn from experience [412]. However, even though voluntary reporting has been beneficial in safety-critical industries such as aviation, given the variable practice by which healthcare organizations handle reports, its impact on patient safety is unknown [413, 414]. Much of the literature on incident reporting in healthcare has focused on the barriers to reporting, along with moralistic admonishments, particularly towards physicians, for lack of participation. Less attention has been paid to whether or not reporting systems contribute to learning and lead to reducing operational failures and improving operational performance [415, 416]. There is limited evidence of how these systems have been used to stimulate problem solving or improve quality [88].“The Achilles heel of reporting systems [is] the flawed notion that reporting has any intrinsic value, in and of itself” [417, p. 538].

“Successful” reporting systems share the characteristics of being independent, non-punitive and confidential, while offering timely and responsive systems-oriented expert analysis and feedback to the operational level [77, 412, 414, 418]. An environment that fosters a rich reporting and learning culture must be created to capture detailed data [418], yet healthcare organizations that systematically do this are rare [419]. Hospital staff and physicians may not report patient safety events because of time pressure, lack of perceived benefit, fear of reprisal, liability, loss of reputation, and peer disapproval [420–422]. Time pressures are particularly significant in a busy ED, and any reporting process needs to involve minimal distraction

from time-sensitive patient care.

Physicians may be more inclined to report incidents where the process of reporting is localized and integrated within medical systems of quality improvement where they have ownership. This may foster more confidence in the ability of reporting to make meaningful improvements [421].

For proponents of formal reporting, the analysis of patient safety events provides information on which practice and policy decisions can be based in order to reduce future occurrences [423]. This assumes that the investigation of events is in depth and comprehensive. This assumption is doubtful. Data on multiple incidents have the potential to help identify genotypic patterns and trends, and give focus to targets for system improvements. In turn, lessons learned can be shared, and safety practices diffused throughout the system.

However, the use of reporting systems has "limited utility" [424]. Practitioners often do not report patient safety incidents because they either do not recognize the threat or harm, are pressed for time, are concerned about medicolegal liability, or are worried about their reputation [422]. Thus, incidents are significantly under-reported in voluntary reporting systems [425]. While voluntary incident reporting likely will remain part of an organization's risk management and quality operations, it is unlikely that incident reporting alone can ever "provide a thorough picture" of all patient safety incidents that occur within a HCO [424].

Incident reporting systems in healthcare have largely failed to live up

to their potential for individual, collective and technical reasons. In large, the problem lies with the emphasis on reporting rather than on learning, so that the same problems (medication errors and falls) are reported over and over again. Reporting systems, as opposed to learning systems, have not advanced to "failing forward", where learning is from new and different problems. In addition, the emphasis has been on reporting failure and adverse events, and not recovery and/or the co-creation of successful clinical practice. Frontline workers are more likely to invest effort in second-order problem solving in contexts in which leaders demonstrate their commitment to problem solving. The potential for risk mitigation is an important predictor of which incident reports elicit problem solving and learning [426].

2.4.2 The Patient Safety and Learning System

The British Columbia Patient Safety and Quality Council (formerly the British Columbia Patient Safety Taskforce) is collaborating with all six BC Health Authorities to implement a province-wide, web-based safety event reporting system. The Patient Safety & Learning System (PSLS) is a provincial change initiative that is intended to support the reporting and analysis of incidents across the continuum of care and spectrum of patient safety incidents, including hazards, near misses and critical incidents, to facilitate system-wide learning from experience and help to create and nurture a culture of safety. The commercial software application that PSLS will use

can be configured to meet the specific reporting, notification and analysis requirements of different care domains and organizational structures. It was implemented at two pilot sites in 2006 to prove concept, and is currently being implemented provincially. The analytic expertise, capacity, and feedback, however, is uncertain. The PSLS will depend upon the current structure of reporting to an operations leader or their designate.

2.5 Making Sense of Safety

Achieving a 'safety culture' hinges in part on our ability to know how to learn from the successes AND failures of our adaptations to cope with complexity. How we think about safety, in turn, influences how we identify and analyze threats and hazards (risk). How we think about safety depends on our accident model. How do accidents happen?

Systems thinking is about relationships and integration. Socio-technical systems are a complex web of dynamic, evolving relationships and transactions. Rather than linkages (mechanical), it sees mutually interdependent interactions. Emergent properties do not exist at lower levels, and are destroyed when the system is dissected as isolated components. Hence, as Dekker [427] argues, there is a need for a functional, ecological model, that is sensitive to the creation of deficiencies, not just their eventual presence, that makes a socio-technical system come alive. It must be a model of process.

Reconstruction of the environment in which decisions are shaped, and

in which local rationality is constructed, can help penetrate processes of sensemaking that are fundamental to organizational learning and adaptation. Drifting into failure is not so much about breakdowns or malfunctioning of components, as it is about an organization not adapting effectively to cope with the complexity of its own structure and environment [see 428]. It is also about taking past success as an indicator of success in the future, as well as altering work to achieve other organizational goals, such as the trade off between production and safety. Organizational resilience is not a property, it is a capability to recognize the boundaries of safe operations, a capability to steer back from them in a controlled manner, and a capability to recover from a loss of control if it does occur [427].

2.5.1 Accident Models

Models inform accident investigation and analysis by imposing patterns on the event and influencing the data collected and the factors identified as causative. They may either filter events and conditions or force consideration of factors that are often omitted by encouraging and guiding a comprehensive analysis [379, 429]. As argued by Rasmussen and many others, devising more effective accident models will require shifting the emphasis in explaining the role of humans in accidents from "error" (deviations from normative procedures) to focus on the performance-shaping mechanisms and context in which human actions take place and decisions are made.

Three categories of accident models frame most accident analysis [35]:

1. Simple linear models, such as the Domino model [147], focus on cause-effect in event chains. Safety fails if a component fails. This is a mechanical model that works in well described linear systems.

2. Complex linear models, such as the Swiss Cheese metaphor [207], focus on unsafe acts and latent conditions. Safety fails if barriers fail in concert with unsafe acts. This is a linear model that accounts for some interactions in organizations.

3. Systemic non-linear models, such as the Functional Resonance Accident Model [144], focus on how normal events and variations can combine and give rise to unexpected, and sometimes bizarre[9], adverse outcomes.

Safety is an emergent system-level property of complex, dynamic socio-technical systems, which makes feedback critical in order to provide adaptive control [379]. Systems models focus on the performance-shaping mechanisms and context in which human actions and decisions take place, and account for interactions among decision makers and the overall decision-making process throughout the socio-technical system [378, 431].

[9]Brian Sinclair's death from treatable causes after waiting 34-hours in an ED [430]

2.5.2 Complexity

A major focus of health services research and quality improvement is reduction of variation. Standardization is a key dimension of quality [432]. These well meaning interventions are often based on a linear Newtonian paradigm that assumes input reliably leads to proportionate response. However, healthcare is not a Newtonian world [433]. Modern HCOs are complex systems [434] marked by dynamic nonlinear interactions [435]. No individual agent can ever know or understand everything that is occurring; small changes can lead to large effects, and big changes can lead to small effects.

Each complex adaptive system (CAS) is unique because of five features:

1. History and initial conditions
2. Particular agents and their unique styles and interests
3. Pattern of nonlinear interactions among agents
4. Local fitness landscape (ecological niche) and its particular expectations, community values, competitive issues, and ecology
5. Regional and global influences, such as the larger health care system, finances, regulations, and culture

As agents of any CAS interact, novelty and surprise emerge in unpredictable ways. Emergence creates a system that is greater than the sum

of its parts, which cannot be understood through a reductionist examination of practice [436].

An individual ED is a unique socio-technical system that emerges in interaction when care providers and staff (agents) come together with everyday goals, preferences, and priorities (initial conditions) within a local context (local fitness landscape) that in turn is impacted by regional and global influences. Practices, however, share a cultural and historical context, and have much in common because of their common goal of seeing patients. From this perspective, variation in EDs is a powerful source of creative possibility and good clinical practice. Two strategies foster creativity: sensemaking and improvisation (bricolage). Sensemaking is a social activity that requires interaction among agents [29]. Improvisation can be described as intuition guiding action in a spontaneous way [437], not as a random guess at what to do, but the result of using high levels of expertise to act in the moment [438, 439].

The traditional, largely unsubstantiated, view is that the best way to improve care is to eliminate variation. A view of practice informed by complexity science suggests otherwise. In a CAS, agents in practices create responses to changing circumstances — they improvise, or play "practice jazz" [440]. Jazz players are often seen as role models of sensemaking and improvisational behaviour (bricolage) [435]. They know a general musical structure, and within that they create jazz. All players have an interdependent responsibility to create good jazz. Dealing with the uncertain nature

of a CAS involves thinking in terms of making sense of what is emerging. It involves building on emergent characteristics of the CAS to develop patterns of social interaction [441] among agents that give them confidence in each other, and enhance their capacity to learn from unpredicted events [442].

EDs are urged to eliminate variation in practice, to implement guidelines, and to diagnose and treat in specific ways. However, successful practices are those that make good sense of what is happening, and effectively improvise. Small changes can have large results in some settings, while large efforts may lead to mediocre results in others. Complexity theory offers a framework for understanding these phenomena in practice. Seeking to eliminate "error" by dampening all variation through the imposition of standardization and external controls is unlikely to be effective. Efforts to improve practice are best served by focusing on improving care as a whole and on developing the skills of relationship-centered care and reflective practice [443].

2.5.3 Resilience

Until recently, the dominant safety paradigm was based on searching for ways in which limited human performance could degrade an otherwise well designed and "safe system". The normative view is that the best way to improve the quality and safety of healthcare delivery is to eliminate clinical variation by standardizing "best practice". This view is pred-

icated on the positivistic and reductionistic assumption that care is based on repetitive (linear) processes, that relationships between cause and effect are knowable, and that "best practice" requirements can be accurately specified *ex ante*. According to this paradigm, "error" is something to be categorized, counted and reported. As a result, there have been numerous proposals for taxonomies, estimation procedures, and ways to capture data for tabulation and extrapolation. Since humans, as unreliable and limited system components, are assumed to degrade system performance, this paradigm often prescribes automation as a means to safeguard the system. In other words, in the "error counting" and "root cause" paradigm, safety work comprises protecting the system from unreliable and limited human components.

However, safety is not a commodity that can be tabulated [34]. Safety is a dynamic non-event [141]. In a world of finite resources, of irreducible uncertainty, and multiple conflicting goals, safety is created through proactive resilient processes, rather than reactive barriers and defenses [444]. Hollnagel [445], argues for the need of a theory of action, including an account of performance variability, rather than the theory of "error". Studies of how complex systems succeed and sometimes fail find that formal descriptions of work (work-as-planned) — embodied in policies, regulations, procedures, and automation — are incomplete as models of expertise and success (work-as-done).

Resilience engineering is a paradigm for safety management that builds

on advances in understanding complex adaptive systems, high-reliability organizations, and how people adapt to cope with complexity in joint cognitive systems to achieve success. The first concept is adaptive capacity, or how an organization copes with disruption, change and pressure. One of the key vital signs is how practitioners make tradeoffs under production pressure. If practitioners are reluctant to sacrifice production, or if peers or management react negatively when production is sacrificed in order to reduce potential risk, then the department is brittle [444]. Another safety vital sign is seen in how well people can cross-check people across roles, and particularly higher status or authority roles. The capacity to adapt and respond to challenge resides in part in the *habitus* of practice, that is, the expertise, strategies, and tools practitioners use to prepare for and respond to evolving circumstances.

By optimizing their processes for maximum efficiency in the short term, organizations become brittle [446]. Routinization enables organizations to exploit their accumulated knowledge, increasing efficiency. Yet at the same time, routinization creates a risk: when organizations are guided by old knowledge, they do not create new knowledge. Ambidexterity between exploitation and exploration requires operational processes that combine high levels of efficiency with the flexibility to evolve and improve over time. As the efficiency oriented focus of process management spreads to centres of innovation, it increasingly stunts an organization's dynamic capabilities [447].

Monitoring and managing resilience or brittleness is concerned with understanding how the system adapts to operational demands, including properties such as [444, p. 22-23]:

- *Buffering capacity*: the size or kind of disruption the system can absorb or adapt to without a fundamental breakdown performance;
- *Flexibility* versus stiffness: systems ability to restructure itself in response to external changes or pressures;
- *Margin*: how closely or how precarious the system is currently operating relative to one or another kind of performance boundary;
- *Tolerance*: how a system behaves near boundary – whether this system gracefully degrades as stress/pressure increases or collapses quickly when pressure exceeds adaptive capacity;
- *Cross-scale interactions*: relate to how a system defined at one scale depends on influences from systems defined at other scales

Resilience is the ability to steer the activities of the organization so that it may sail close to where accidents will happen, but always out of that dangerous area.[10] This implies a very sensitive awareness of where the organization is in relation to danger, and a very rapid and effective response when signals of approaching or actual danger are detected,[11] even unex-

[10] Sailing at the edge of going into irons when sailing close hauled
[11] Tell-tales are a sailor's friend when sailing against the wind

pected and unknown ones. Training, often used to prevent errors, can create them; information richness introduces inefficiency, too little produces inaccuracy; teams have multiple points of view that enhance safety, but as they become a cohesive group they share assumptions, so the "requisite variety" important to safety is lost [136, p. 297].

Variety is the novel and positive side of chaos, and variability in performance is a source of variety. Human action is the local optimization of the gap between normative rules and situated performance. EDs are dynamic, open, high hazard, continuous operating systems that demonstrate considerable resilient capacity [448], but often perform in less resilient, more brittle ways [49]. EDs have adapted to the problem of overcrowding in a variety of ways, such as dedicating entire units to inpatients, adapting previously unused space such as hallways to use as treatment spaces, and dynamically changing the manner in which work is performed. As overcrowding has increased in severity, this adaptive capacity has become strained, and is near a point of complete breakdown [45].

Reliable outcomes require the capability to sense the unexpected in a stable manner and yet deal with the unexpected in a variable manner [152]. The process of sensemaking is stable although the adaptive performance is variable. Hence, sensemaking is essential to resilience. Focusing on improvisation in non-routine action renders plain the need for wariness and adaptation (reflection-in-action [449]). Sensemaking is a process of structuring the uncertain, a complex interaction of seeking information,

ascribing meaning, and action. That is, sensemaking is the interplay of action and interpretation [450]. Thus, to explain failure, we must seek to understand how people's assessments and actions made sense at the time, given the circumstances that surrounded them [451].

Improvisation, using a frame to initiate sensemaking of incoming data, but "holding tools lightly" and discarding as needed if data are incongruent, implies humility not hubris. Resilient organizations foster capability to anticipate, attend, act, and adapt. The ability of an operation to reconfigure spontaneously in demanding situations is a key characteristic of high-reliability organizations [452]. Thus, there is an inherent tension between prescription and practice. In a field of practice, prescription offers a space of affordances and constraints, but must be applied in context. Human action is repetitive, but in the sense of re-enactment in analogous situations [453].

Healthcare can be described as "cooperative" sequential care rather than collaborative care [454]. Delivery of care is unfortunately all too often characterized by failures to interact across traditional hierarchical and professional barriers, competition for control, and silo thinking. But we excel in coping with emergent and complex situations when we acknowledge that individual expertise is necessary but insufficient to make sense of and adapt to the demands of a case. In recognizing the distributed cognitive system, we are more resilient in anticipating and acting in evolving circumstances. Informal, shared and negotiated decision making allows

for novel and effective strategies to emerge, and sensemaking frames or perspectives to be shifted [454]. Study of successes and failures within healthcare may elucidate the conditions, features and characteristics necessary for sustained resilience in clinical care.

System performance is related more to interactions than to elements. The work of a hospital ED can be seen both as a CAS, as well as part of a larger complex system, where operational performance is heavily interdependent upon other hospital departments and outside agencies [455]. That is, an ED is "tightly coupled" and interdependent on the performance of other departments such as laboratory and diagnostic imaging. Delays or failures may interact and resonate across the nexus of interdepartmental practices, and create far reaching and unanticipated threats to safety [456]. Hence, appreciation of and co-ordination with these cross-scale inter-dependencies contributes to a more adaptive and resilient system.

Resilient adaptations at the department level can create additional hazards and failures at the organizational level and vice versa (cross-scale interactions). At any level of the organization, actors are situated and bounded, and are inherently limited in their ability to assess the potential interactions and resonance with adaptations on levels other than their own. The ED system is innately resilient, flexible, responsive, and tolerant of uncertainty. In contrast, the ward system maximizes predictability and regularity at the expense of flexibility and expedience [457]. Both systems

have adapted to their local ecological landscape. The ward system is brittle in the ED, even as the ED system is brittle on the wards. Hence, the conflict created by using both systems simultaneously in the same work space has led to complex systems failures and threatened patient safety [457].

2.6 Paradigm of Inquiry

Culture emerges out of our conversation (discourse) and "practice". It is enacted in what we say and do in our interactions with each other. It is the interstitium that we share. Much has been written in philosophy, sociology, and psychology about how people explain their actions to themselves and to others through stories. Rather than offer principles, rules or reasoned arguments, we tend to account for our actions through narrative: sequences of statements connected by both a spatial-temporal and ethical-moral ordering [458].

Language reflects and sustains organizational and cultural arrangements at the same time as it accomplishes social action. In other words, "stories people tell about themselves and their lives both constitute and interpret those lives; stories describe the world as it is lived and understood by the storyteller" [459, p. 198]. Narrative is constitutive of social life, even as all aspects of the social world are storied. To examine action outside of the narrative that constitutes it, is to distort through abstraction and decontextualization, depriving events and persons of meaning

[25, 73, 110].

Vygotsky, Giddens, and Bourdieu focus on action (practice) as the recursive point of intersection between human agency and social structure. "Practice", like risk and safety, has multiple meanings; here, I refer to "practice" as the way something is done, as in the "logic of practice" [96]. The turn to practice is tied to an interest in the "everyday". Practice theory is a type of cultural theory, where the social is localized in practice, as opposed to mind, discourse, or interaction. Practice is a "nexus of doings and sayings"; therefore, any analysis of practice must offer an account of action [460, p. 90].

> To insist that the bedrock of all order and agreement is agreement in practice is to cite something public and visible, something that is manifest in what members do. Moreover, accounts of order and agreement that refer to practice presume not passive actors but active members, members who reconstitute the system of shared practices by drawing upon it as a set of resources in the course of living their lives. Accounts of this kind are more satisfactory empirically than passive actor theories [95, p. 17]

Taking practice seriously means considering its unique and radical character as engaged and contextually situated activity [31, 96, 461]. Practice originates from non-deliberative, background understandings embedded in our cultures and relationships [399, 462]. In this sense, practices are

more pre-theoretical than theoretical, more concrete than abstract [463–465]. Hence, what is ontologically real and has being in practice cannot be understood apart from its relations to other aspects of the context. Indeed, practices do not exist, in an ontological sense, except in relation to the concrete and particular situations and cultures that give rise to them, implying what might be called a relational ontology [32].

Thus, "the bureaucratization of safety is counter-intuitive" [466, p. 211]. In order to act collectively, we adopt simplifying assumptions that limit our imagination on risk and safety [467], and yet organizations rarely acknowledge the importance of this interweaving of work, perceptions and attitudes and the need to develop *ad hoc* strategies to deal with context-specific problems. The view of 'safety culture' as a unitary phenomenon has led to theorizing of organizational models based principally on command and control and on a bureaucratic culture, thereby undervaluing the empirical evidence yielded by numerous studies (from the Cuban Missile Crisis to Challenger [468]) that have shown conflicts of interpretation and differences in priorities with regard to safety practices between managerial and operational levels. Recognition of a plurality of 'safety cultures' embedded in work practices may lead to consideration of safety as a social practice which springs from the interdependence among human, organizational and institutional actors, technological artifacts and situated conversations. Hence, exploration of the broader issue of how human agents engage in practical activities begins with actions [140, 469].

High reliability in certain complex organizations has been explained as a characteristic of 'collective mind' [140]. Here, mind is understood as a style of action — a pattern manifested in action. Even as individual mind is "located" in the specific activities individuals engage in, so 'collective mind' is manifest in the manner in which individuals inter-relate their actions. More specifically, Weick and Roberts argue [140, p. 363] that individuals "construct their actions (contribute) while envisaging a social system of joint actions (represent), and interrelate that constructed action with the system that is envisaged (subordinate)." Individual contributions and the collective mind are mutually constituted: a contribution helps enact collective mind to the extent to which it is "heedfully" interrelated with the imagined requirements of other contributing individuals in a situation of joint action. Hence, collective mind is an emergent joint accomplishment that is constituted as individual contributions become more heedfully interrelated in time. Collective mind is therefore a distributed system, known in its entirety to no one [140, p. 365].

The actions of an emergency care provider are part of a complex practical activity which involves the intentional use of both language and tools. A pattern can be discerned by looking at actions over time: there are regularities in behaviour that function as normative constraints, and acquired skills which enable engagement in the normatively bound activity that practice entails.

However, the "application of rules cannot be done by rules" [470, p.

83]. No set of rules can ever be self-contained and complete. Thus every act of human understanding is essentially based on an unarticulated background of what is taken for granted [471, p. 47]. Misunderstandings arise when we lack a common background in which case we are forced to articulate the background, and explain it to ourselves and to others. To accept this view, means that the common sense view (or 'representational' or 'rationalist' view) that the world "out there" is understood by forming representations of it "inside" our minds, which we subsequently process, is seriously deficient [472, 473]. It does not mean that we never form representations of the world, but that such representations are "islands in the sea of our unformulated practical grasp on the world" [471, p. 50]. According to this view, the human agent' s understanding resides, first and foremost, in the practices in which he/she participates. The locus of the agent's knowing is not in his/her head but in practice, that is to say, his/her understanding is implicit in the activity in which he/she engages.

A navigator, for example, does not form explicit representations of his instruments. His ability to act comes from his familiarity with navigating a ship, not by his representation of the navigation instruments in his mind [121]. His world is "ready- to-hand" [474] through social activity in which he, the practitioner, is engaged. In addition, when I am aware of something, I know it as a whole, by integrating certain particulars, which are known by me subsidiarily [399, 462]. I integrate the particulars tacitly, and acquire particular skills through training in order to relate to the world in

certain ways [462, p. 31]. Therefore, social activity or practice (e.g., navigating, nursing, medicine, and not the cognizing subject, is the ultimate foundation of intelligibility [469, 474].

It is the "active presence of the whole past", that gives social practices both a continuity and "a relative autonomy with respect to external determinations of the immediate present" [96, p. 56]. "In other words, history leaves its marks on how actors see the world; every time we act, we do so by means of the habits of thinking we acquired through our past socializations. At any point in time, our habits of thinking have been historically formed through our participation into historically constituted practices" [469, p. 104]. Thus, to understand why practitioners act the way they do, we need also to inquire into their *habitus*.

It is through the joint activities of framing, and reframing, that actors arrive at a joint problem definition. From this social practice, a common language and new sense of community can emerge, opening up possibilities for innovation, and fostering learning and change [475, 476]. Actors are not isolated, but are part of a social network, and any problem definition or action choice influences and is influenced by other actors [477]. Hence, the social context in which the subject is embedded, or the communities of practice in which the actor takes part, shape the way in which a problem is understood and the meaning that is given to it [386].

From a relational perspective, uncertainty impinging on a decision situation has no meaning in itself, but acquires meaning through the rela-

tionships established between the decision maker and the socio–technical–environmental system. The decision maker operates at both the content and relational levels. In this way, the definition of a problem and what is uncertain about it depends not only on scientific or expert understanding, but on the knowledge, views, and preferences of the decision maker in relation to those of other actors with whom the decision maker interacts to make sense of the situation [478]. Uncertainty, then, becomes a property of how an individual in a social context relates to a system through certain practices and activities. A more effective way of dealing with unpredictability is to create capacity, through learning and adaptation, to respond flexibly and effectively to changing and unknown conditions, that is, by fostering resilience through collaborative governance.

2.7 Summary

The history of patient harm is long, but it is only in the past decade that safety in healthcare has garnered worldwide attention. Thinking about safety in other safety-critical industries has a much longer history, and healthcare continues to have much to learn. In this overview, I have considered the problem of patient harm in hospital EDs and pointed to the difficulties of the "error counting" strategy. I have briefly reviewed four vulnerabilities in emergency care — capacity, cognition, communication, and collaboration — and have demonstrated the need to understand the collective, embedded, and distributed nature of work in an ED. I have

also reviewed the construct of 'safety culture' and noted the theoretical and practical difficulties of "measurement". I then reviewed safety learning and ways of making sense of safety by considering different accident models, including the concepts of complexity and resilience. Finally, I situated my perspective in the body of practice theory.

The whole is more than the sum of the parts

Metaphysica

Aristotle

Chapter 3

Methodology

In this dissertation I invoke an ethnographic strategy to construct a "thick" story of how patient 'safety' is created in the everyday practices of a hospital emergency department. From a hermeneutic phenomenological stance, I grasp the situation in which human actions make (or acquire) meaning [479, p. 296] in order to claim I have an understanding. Interpretive views are necessarily partial, indeterminate, and co-constructed. I recognize that there are multiple tellings and retellings of stories about safety in the department, and it is in telling of these stories that I claim to render a "thick" description, however partial or indeterminate my description remains. I sought to listen to the voices of my colleagues — including nurses, physicians, technical and clerical staff, and leaders — to explore the ways in which they make sense of 'safety' in their everyday practice, and to remain open and reflexive to the stories and narratives they shared.

Patients, families, nurses, physicians, staff and administrators are all involved in activities that co-participants must anticipate and interpret under the urgent pressure of emergency care delivery, as well as during more reflective times of charting, meetings, breaks, and walks home. My objective was to understand the complexities of hospital emergency care and to explore how care providers create 'safety' in their everyday practice. My underlying premise is that any efforts to change practice should be preceded by efforts to understand it and "tell it like it is", emphasizing the real, not the ideal.

In this chapter I outline the elements of my research design. First, I describe the research setting and the participants involved. Next, I offer a brief overview, and declare my philosophical assumptions and values. I then review the issue of measurement and assessment of safety climate and 'safety culture' before explaining the methods of data collection and data analysis for the multiple methods I used: 'safety culture' survey, in-depth interviews, focus groups, document analysis, and observations.

3.1 Setting

I conducted this 35-month ethnographic inquiry at a 550-bed acute care, academic and research hospital located in the downtown core of a major Canadian urban centre. The hospital operates as a publicly funded institution within the Canadian regulatory, economic and socio-political environment, and provides quaternary, tertiary and secondary care to the local

community and patients from across the province. The ED has roughly 60,000 visits per year, and is a district trauma centre (no neurosurgical service) that handles trauma cases with an Injury Severity Score of less than 15 (primarily penetrating trauma). The hospital has a longstanding history of providing care to socially and economically disadvantaged populations.

The department footprint is chromosome shaped with the entrance and triage at the centromere. Care is provided in 5 spatially discontinuous treatment areas (6 including the waiting room and hallways) totalling 48 care spaces (beds and chairs). The department is staffed by nurses, physicians, and staff (unit coordinators, porters, ward aides, technicians, social workers), with support from hospital technicians and clerical staff, and contract services (housekeeping and security).

Major renovations of the ED were ongoing during the course of the study and impacted the timing and nature of data collection (focus groups and observation periods).

3.1.1 Gaining Access

I did not access the field, for I was already in it. Fully situated as a "complete member" of the department [480] in my position as an emergency physician, I occupied the "third space" between insider-outsider in a place of paradox, ambiguity and ambivalence [481]. I was firmly in all aspects of the research process, and carried it with me. I was as much a part of it, as it was a part of me. I worked clinically alongside periods of data col-

lection, often on the same day, but never at the same time. Thus, I moved between roles as a clinician and as a researcher. This generally presented few challenges, apart from sleep deprivation and fatigue, but I did find that some staff avoided me during the communication observation phase. I was dubbed a "corporate spy", and conversations were muted or "put on" within the range of the microphone. In one instance a nurse pulled me aside to suggest that the individual who I had shadowed on an earlier occasion had been "unusually nice", and on another occasion the participant I was shadowing made an effort to interact and keep busy. This Hawthorne effect impacted the social aspect of the communication observation, but based on my experience, did not appear to impact my core observations (clinical and operational communication), for these aspects of work were in large driven by flow and demand.

3.1.2 Participants

Over the three-year study period 85 individuals in the department and organization participated in one or more of the data collection phases [see Table 3.1]. Sampling was purposive to reflect a broad range of perspectives and voices [482]. The participants represented emergency nurses, unit coordinators, technicians, social work, administration, clinical and operational leaders, educators, physicians, and learners. Hence, participants were from within the department, in leadership, clinical, clerical, technical, support and educational roles, and from outside of the department in

organizational administrative roles. Relative new-comers and long standing members were included, as well as those who had extensive experience in other EDs around the world.

Role	Number	Proportion
Emergency Nurse (including licensed practical nurse and registered psychiatric nurse)	31	0.36
Emergency Nurse Leader (including operations leader, clinical nurse leader, nurse educator and nurse clinician)	12	0.14
Emergency Staff (including unit coordinator, clinical assistant, admitting clerk, porter and social worker)	15	0.18
Emergency Physician (including emergency medicine resident)	24	0.28
Administrator (including senior leadership team)	3	0.04
TOTAL	85	1.0

Table 3.1: Participants by organizational role

3.1.3 Ethics

The study was approved by the Behavioural Research Ethics Board at the University of British Columbia, and by the UBC/Providence Research Ethics Board in 2005. Amendment for the revised focus group discussions, and addition of the communication observation strategy, was approved by the UBC/Providence Research Ethics Board in 2008. Ethics approval certificates are located in Appendix B.

3.1.4 Timeline

'Questerviews'[1] were conducted between February 2006 and September 2007, following regional implementation of an Over Capacity Protocol (OCP) in January 2006. OCP was a system reaction to patient deaths in the emergency department waiting room in summer 2005. The organization conducted an organization-wide patient 'safety culture' survey in November and December of 2007 following Accreditation 2007. Focus groups were conducted between June and August 2008 during major departmental renovations, and coincident the departure of nursing and physician leadership, while the observation periods were conducted in November and December 2008 during the transition into the newly renovated acute side of the department.

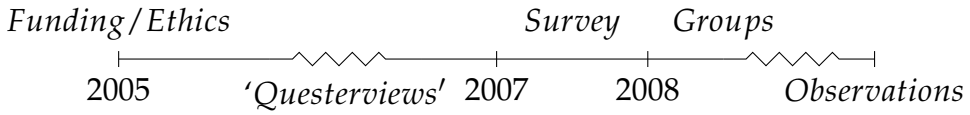

Figure 3.1: Timeline

3.1.5 Unit of Analysis

The unit of analysis is the activity system of an historical, socio-technical, and culturally situated hospital emergency department.

[1] A health services research strategy of using validated, standardized self-completed survey questions in an in-depth interview [483]

3.2 Methodology

I conducted a multi-perspective, multi-method (qualitative, quantitative, mixed) practice-based ethnographic enquiry over a 35-month period between February 2006 and December 2008. I employed multiple strategies to collect and analyze artifacts (electronic records and documents), perceptions (survey, 'questerviews' [483], and focus groups), and patterns of interaction (observation and audio) related to safe patient care in the emergency department. I draw pragmatically and eclectically on positivist, interpretive and recursive approaches in this ethnography of situated work, apply interpretive synthesis to approach tension and incommensurability, and use narrative to summarize key methods and findings. My purpose for utilizing multiple methods is complementarity and comprehension [484], rather than triangulation or validity. I examine 'safety culture' from various angles to provide a "rich and deep" appreciation of its complexity and to provide scope for refining our understandings.

3.2.1 Philosophical Assumptions and Values

Ontology

I assume there are multiple realities and frames employed by social actors in making sense of their own activities and those of others. Each participant's interpretation is recursively constrained and shaped by practices that occur in the context of specific social relations, physical surround-

ings, modes of communication, bureaucratic structures, and prior institutional assumptions. Hence, my ontology lies between an interpretivist (hermeneutic) and a recursive (participatory) paradigm.

Epistemology

I assume knowledge is context dependent, embodied and enacted in practice. My findings emerge out of participants' inter-action within the situated socio-technical activity of clinical practice.

Role and reflexivity

I position myself as a reflexive co-producer of action in this socio-technical system. I am a white male emergency physician with a decade of "insider status" and active, first hand experience of the ethnographic setting. As such, I collected data as an immersed participative observer located in a community of practitioners within a hospital ED. I gathered data with my colleagues across a range of sources and made note of my own thoughts and feelings as I encountered the data. I hold no administrative or education portfolio, but as an emergency physician, I acknowledge my privileged position within the hierarchical structure of the department. That is, I am in an equal and collegial position with my physician colleagues, but am in a position of formal power with regard to nurse and staff colleagues.

I engaged 'questerview' co-participants in a conversation about patient safety using the Hospital Survey on Patient Safety Culture (HSOPSC) [see Section 3.5.3, Appendix A] [15] to facilitate and guide our dialogue. The

dynamic was dialogical and reciprocal. I invited co-participants to explore their responses to the HSOPSC with me, as well as other 'safety' issues they felt were relevant. I offered alternative wordings to probe their perceptions, and encouraged them to reflect critically on their interpretation of the meanings behind the statements. I also sought their stories or experiences and shared readings or experiences that I had. When presented with a "you know" characterization, I acknowledged that I had an opinion, but noted that I was a learner and did not know their perceptions. Hence, I was interested in their experience. I allowed participants to continue until they were finished, and to end the interview on their schedule.

I was less directly involved in the group discussions and observations. I remained silent through much of the focus groups, and relied on the facilitators to guide the discussion. Likewise, during the communication observation periods I stayed at a respectful distance, but engaged participants in conversation at their initiation, or if I needed to clarify.

Axiology

I assume the value-laden nature of socially co-constructed knowledge. I am not a disinterested party. The 'safety' of patient care in the ED is a practical, ethical and moral public health issue. I undertook this journey to engage my ED colleagues in a reflexive conversation on 'safety' with the aim of transformation.

Lens

I explore how 'safety' is created in everyday practice through the lens of practice theory within the recursive paradigm. I recognize multiple versions of 'safety' as expressed in participants' perceptions and practices, and consider a collective view of 'safety' as located in situated practice within the historical, socio-technical, and cultural contexts in which interaction occurs, and where practitioners create meaning together.

3.3 Methods

In this section I present an overview of methods used, then follow with a review of methods for measurement of safety climate and 'safety culture'. I then present detailed description of methods for each phase, including 'questerviews', focus groups, surveys, and observations.

3.3.1 Data Collection

I used concurrent and sequential mixed method data collection strategies to collect and compare structured and unstructured qualitative and quantitative data on perceptions of safety and patterns of interaction in the ED. The data were collected and analyzed iteratively using a four-phase approach beginning with 'questerviews', followed by the organizational survey, focus groups, and observation. This pragmatic strategy offers a deep understanding of survey responses, as well as a detailed assessment of patterns of responses [483]. The total time of primary data collection was

greater than seventy hours [see Table 3.2].

Phase	Number	Time
'Questerviews'	26	40 hours, 29 minutes
Focus groups	4	6 hours, 13 minutes
Observations	15	24 hours, 56 minutes
TOTAL	45	71 hours, 38 minutes

Table 3.2: Transcribed interview and observation time by study phase

3.3.2 Data Analysis

I attended to how participants constructed the meanings of their actions in their everyday practices, and reflected on the contrasts and comparisons within and across participants, time, and activities, to build interpretations that are grounded in the data. The research is grounded in the ongoing narrative of professional practice and offers clues to the values and beliefs that are culturally determined but not explicitly articulated. Inquiry into the experiences and perspectives of emergency healthcare providers permitted description and analysis of the context of normal operational performance. I examined relationships between and among actors and actions, and sought an *emic*[2] understanding of safety in everyday practice.

[2] An insider account

3.4 Measurement or Assessment of Safety Climate/Culture

I explored concepts, theories, models and definitions of safety climate and 'safety culture' in Chapter 2. I turn here briefly to measurement and assessment. The majority of 'safety culture' research in industry [335, 338] uses survey instruments to collect individual perceptions, attitudes and beliefs to assess coherence and commonality. Although there have been many attempts to develop an instrument to measure safety climate and 'safety culture' in safety-critical industries, including healthcare, the act of measurement implies some degree of observability and comparison to some agreed upon reference scale, which raises the question if 'safety culture' can be measured at all [336]. There is a tension between the holistic character of culture and the reductionistic approach of measurement, and no measurement approach has universal agreement.

Several reviews of safety climate instruments in safety-critical industries [309, 335, 336, 340, 485, 486], including healthcare [366, 367, 487, 488], have been published in the past decade. This strategy is the quick and dirty "wet finger" to find out which way the wind blows [336]. Safety climate is more superficial and transient than 'safety culture' and questionnaires can only provide a "snapshot" [485]. There is a large variety in factors (dimensions and scales) that make up the safety climate concept [335, 338, 485], and the variance created by the "dirtiness" of questionnaires may obscure shared assumptions if groups are not large enough to

average out random influences [336].

In healthcare, there are multiple 'safety culture', or more accurately safety climate surveys, with many adapted from safety-critical industries outside of healthcare. Most do not specify a theoretical model, and none of the currently available instruments has adequate psychometric properties [16], including the Hospital Survey on Patient Safety Culture [15, 370, 489], and the Patient Safety in Healthcare Organizations [16, 368]. Poor psychometrics may result from potential or inherent imprecision in the construct, context specificity, or the need for a more theory-driven construct in healthcare [16]. Furthermore, blunt survey instruments can only capture the superficial level of safety climate, necessitating more anthropological and qualitative strategies to begin to describe 'safety culture' [490]. Hence, I chose to use a 'safety culture' survey instrument as a semiotic tool using the 'questerview' strategy to explore how emergency care providers conceptualize and make sense of patient safety.

3.5 'Questerviews'

The aim of this phase was to develop a detailed description of local and contextual knowledge around patient safety, as well as the assumptions, beliefs and values that allow emergency health care providers to interpret patient safety incidents and to assign meanings to those events. In-depth, semi-structured interviews with emergency care personnel and decision makers using standardized self-completed survey questions [483] from the

HSOPSC [350] were conducted to explore the mechanisms and situated interactions by which safety is constructed [143, 491], and the cultural factors and beliefs that encourage or discourage the identification and reporting of unintentional unsafe acts and adverse outcomes in emergency health care delivery.

'Questerviews' offer a pragmatic way to integrate qualitative and quantitative methods, and differ from other semi-structured interviews and verbal questionnaires in that the stimulus material is a standardized quantitative survey instrument, to which participants are free to explore their responses, as well as other salient issues they deem relevant. Use of standard measures within in-depth interviews consistently provokes narratives that are both complex and illuminating [483], whereby qualitative interview data can help explain quantitative data by digging below surface observations.

3.5.1 Recruitment and Sampling

A purposive 'vertical' sample of twenty-six urban, tertiary care emergency department care providers with varying roles and levels of experience (nurses, physicians, resident, social worker, technician, and unit coordinator), and four administrators (departmental and organizational) was recruited in order to contribute to a data set that is sufficiently broad and deep, complex and rich.

3.5.2 Ethics

Interview participants were informed of the nature of the study and provided written consent prior to participation. All identities were deleted, and all data was marked by code and kept in a secure, locked location. Digital files were kept on a password-protected computer. Avenues for obtaining professional counselling or support were offered to each participant.

3.5.3 Instrument

The Hospital Survey on Patient Safety Culture (see Appendix A) is a widely used [366, 367, 370, 489, 492, 493] 42-item survey developed under sponsorship of the Medical Errors Workgroup of the Quality Interagency Coordination Task Force and funded by the Agency for Healthcare Research and Quality. It is designed to measure 2 overall patient safety outcomes and ten dimensions of workplace culture related to patient safety [15]. Of the 42 items, 17 are asked from a "negative" viewpoint and are subsequently reverse-scored. Factor structure is acceptable, but differences have been demonstrated across healthcare systems [15, 370, 489]. Although not psychometrically robust, the instrument is nevertheless "standardized" in that it is widely used and the statement wording is constant across time and place. Thus, the primary value of the instrument is as a semiotic stimulus [494].

3.5.4 Data Collection

I interviewed healthcare providers, support staff and decision makers in the ED and organization where I work to explore and describe how we make sense of our work in light of the challenges and competing demands we face, to understand how safety is created in the everyday practice of emergency care, and to understand the barriers to talking and learning about unintentional unsafe acts in the process of healthcare delivery in the ED. I conducted 22 interviews with front line ED healthcare professionals and decision makers to explore their experiences and perceptions of safety within our work environment. An additional 4 interviews were conducted with emergency physicians and nurses at another urban academic tertiary care ED to compare major themes.

Statements from the HSOPSC were explored in conversation following the method of 'questerviews' [483]. 'Questerviews' are a mediated three-way interaction between researcher, participant, and semiotic tool (acts as a template of the learning context, a record of discussion, and a stimulus for talk and elaboration). The technique aims to gather information on participants' attitudes and beliefs about safety, and to trigger detailed narrative exploration of the complex factors that contribute to patient safety culture.

Participants completed the HSOPSC at the beginning of the 'questerview'. I left them alone for 10 to 15 minutes, and did not offer any clarification of the instrument. They were then invited to review the tool and

explore the questions or issues it prompted. Informants were encouraged to explore the meanings of the statements and to reflect upon them critically.

I invited participants to tell me about their experience working in an ED, and then framed the topic on patient safety by inviting them to talk about "safety in the ED". I allowed participants to expand on areas which they felt were important, and gave them opportunity to uncover their "frameworks of meaning" [495]. I avoided asking leading questions or providing judgements on views expressed. I sought narratives of safety, recovery and failure in the ED setting. Participants were encouraged to respond in story or narrative form using broad, open-ended questions. I used prompts and probes to facilitate generation of a narrative [Table 3.3], and provided additional statements from the Patient Safety in Healthcare Organizations instrument [368] as alternate wording to help broaden and clarify the domains under discussion.

How did you decide on your answer to this question?

How did you interpret or decide what this question was asking?

Thinking back, is there a time where you might have answered differently to this question?

Can you tell me what has changed that lead you to change your response?

Were you at all unsure about how to answer this question? Why or why not?

How else might you ask this question?

If you had to explain how to answer this question to someone else, what would you say?

How easy or difficult was if for you to remember how many times in the past year you have reported threats to patient safety?
What timeframe would you use to answer this question?
Can you think of any reasons why a person might have difficulty in answering questions about patient safety?

Table 3.3: 'Questerview' probes and follow-up questions

Participants were encouraged to explore "second stories" about systemic vulnerabilities [1], as well as their own "sharp end" experiences. They were also asked in closing if they thought there was anything further that they felt was important to understanding patient safety in the ED that had not been covered. Each interview averaged approximately one hour and 40 minutes. Field notes were written up immediately following the interview to record information about the setting, nonverbal behaviours, and impressions and analysis. A journal was maintained to record hunches and ideas for follow-up.

Statements from the HSOPSC were used as a semiotic stimulus to encourage and facilitate interviewees to speak about patient safety. The HSOPSC itself is a cultural text, a product comprised of signs and signification systems. The survey presents an interpretation of 'safety culture', while the interviewees represented their interpretation of it in a semiotic process. As such, interviewees were invited and "empowered" to express their social experience and cultural knowledge about patient safety in the ED. The survey as a stimulus text brought "not now" moments and "not

here" events into the "here and now" interaction of the interview [494].

The interview did not proceed solely as an interaction between the interviewee and me, but importantly incorporated the survey as a stimulus text. The statements and domains of the survey invited respondents to express their position in relation to it, as an iconic microcosm of patient 'safety culture' to which they could compare their own experience. Some of the statements also served a more provocative role, inviting critical reflection of how their perception of patient safety in the ED in most cases failed to approach the "ideal" state as suggested by the survey. In this way, the 'questerview' strategy of utilizing a standardized survey instrument as a stimulus text in a reflective "here and now" interview, created "a fruitful tension between externalized, objectified culture, and subjective, situational meaning-giving. The tension opened up cultural paths (clues), mirrors (icons) and contradictions (provokers), making it possible for the researcher and the interviewees, as they interpret the stimulus text, to step out of themselves in a comparable manner, although in such a way that they can at the same time express their own experiences by following, citing, or abandoning the concrete and externalized marks of the stimulus text." [494, p. 359].

3.5.5 Data Analysis

The individual interview transcripts were analyzed as a whole unit of discourse. Transcripts and notes were read and re-read noting patterns and

themes. Analysis continued with attempts to identify and narrow the recurring patterns within these areas, look for areas of disjuncture in these overall patterns, and to refine emergent patterns. Data were coded for meanings and actions, looking for relationships between incidents and processes. Direct quotations were used to illustrate themes. Data was coded manually and entered into a computer software program (N-Vivo 8®) to ease the process of data sorting, storage and retrieval.

3.6 'Safety Culture' Survey

An organization wide patient 'safety culture' survey was conducted by an outside independent research agency in the fall of 2007 using the 2007 version of the Modified Stanford Instrument. De-linked anonymized data from the ED was made available for comparison with the themes that emerged out of the interviews and focus groups.

3.6.1 Recruitment and Sampling

All nurses, staff and physicians in the department were invited by the organization to participate in the organization-wide patient 'safety culture' survey. Potential participants were recruited by letter and invited to participate using a paper-based survey and pre-paid envelope or to complete the survey on line using a unique anonymized access code. The questionnaire was mailed to employees and physicians in October 2007. A two-stage mailing approach was used. All identified staff and physicians

were mailed a survey, followed by a reminder postcard to non-responders roughly three weeks after the initial mailing. I also sent one personal reminder by email to the emergency department nurses, staff and physicians.

3.6.2 Instrument

The instrument used in the organizational patient safety culture survey is the modified Patient Safety in Healthcare Organizations (PSHCO) tool, otherwise known as the Modified Stanford Instrument, 2007 version (see Appendix A). This instrument is a version of the survey tool initially developed by Singer et al. [368] at the Patient Safety Center of Inquiry at VA Palo Alto Health Care System, that was modified with permission by Canadian researchers [496]. The Modified Stanford Instrument (MSI), as it has come to be called, has been used in other Canadian healthcare settings, as well as in a large, multi-centre survey of four Canadian healthcare organizations representing six hospitals and health regions from across Canada [497]. A pan-Canadian database is available with results using the MSI. The MSI patient 'safety culture' instrument is also now required as a performance measure by Accreditation Canada for Canadian healthcare organizations as part of their Qmentum accreditation program [498].

The MSI 2007 version is a 46-item questionnaire that includes items designed to measure five dimensions of safety climate: organizational leadership support for safety, unit leadership for safety, perceived state

of safety, shame and repercussions, and safety learning behaviours. Safety learning behaviours, in turn, is now broken into three dimensions including learning responses, reporting culture and learning culture. Findings from dimensions related to organizational leadership support for safety, perceived state of safety, and shame and repercussions had been reported for clinical nurse leaders [499], whereas the dimension on unit leadership for safety was adapted from the Supervisory leadership dimension on the AHRQ's HSOPSC [15]. Statements from all dimensions were answered using a five-point agree-disagree Likert-type scale. All of these items also had a not applicable option. Also adapted from the AHRQ's HSOPSC were two items designed to provide an overall assessment of patient safety at the unit and organizational levels. These two questions were answered using an A (excellent) through F (failing) rating scale.

All dimensions had been subjected to exploratory factor analysis and reliability analysis and had reportedly yielded "reasonably strong outcomes" [497]. However, psychometric analysis of two cross-sectional surveys using earlier versions of the MSI did not yield acceptable levels of fit on confirmatory factor analysis [16]. Exploratory factor analysis and reliability analysis suggested that only the two leadership dimensions were reliable: organizational leadership for safety (α = 0.88) and unit leadership for safety (α = 0.81). The analysis of within-group agreement demonstrated stronger within-unit agreement than within-organization agreement on all five dimensions, supporting the premise that safety climate,

and possibly culture, is local. Hence, caution is warranted in the interpretation and meaning of results, and particularly group comparison using benchmarking [16].

3.6.3 Data Collection

Data collection and processing was performed by an independent healthcare research firm in Canada. The participant access codes were unique to each individual and were linked by the third-party firm to organizational data about age, date of hire, years of service, job category, job type, labour agreement, home department, care unit, program, site, and senior leader. The de-linked anonymized raw data and analysis were returned to the organization by the independent research agency.

3.6.4 Data Analysis

The anonymized raw data from the independent research firm was graciously and generously shared with me by the organization in the form of an Excel®spreadsheet, which I in turn coded and imported into Stata 10®(StataCorp, 2007). I was then able to sample and compare the responses from the Emergency Department to those from the organization as a whole.

I selected responses from the appropriate "HomeSite" where the "Home Department", "Care Unit", "Care Unit Name", "Care Unit Description", "Paid Department", or "Academic Department" included the designation

EMERGENCY or EMER. This gave me a sample of 40 participants.

Given that the survey data were anonymized, it is possible and probable that some participants in the 'questerview' phase may also have participated in the survey. However, comparison of the "Job Family" and "ExpGroup" (length of employment) variables with participant attributes in the 'questerview' sample, suggests that the overlap was less than 10 percent (there were three only "matches").

The analysis was conducted to address the research question: how do emergency department care providers and staff perceive the unit-level patient safety climate? Responses were partitioned by staff, nurse, physician, and leader, and coding was kept as ordinal data for exploration with ordinal regression using patient safety grade as the outcome measure. The ordinal codes were also transformed into safety "negative", "neutral" and "positive" responses, and by combining "negative" and "neutral", as dichotomous responses (dichotomous). The data were not analyzed as interval measures. Composite scores for each dimension were calculated by summing the "positive" or "problematic" responses across dimension items and dividing by the sum of the number of responses by item for the dimension. Each dimension item was weighed equally.

Statistical analysis was descriptive and exploratory and not intended as hypothesis testing. Differences between unit level roles in the proportion of positive response and proportion of problematic response were compared using Fisher's exact test. Correlation of dimensions and items

with overall patient safety grade was estimated using Spearman's rank correlation. Differences between unit level results and benchmark results were compared using χ^2 with Yates correction.

The proportion of positive responses by item and domain were plotted on the x-axis against correlation of each item and domain to overall patient safety grade at the unit and organizational level on the y-axis to produce a performance grid. Threshold lines were placed at 50 percent positive response and correlation of 0.50. Items and domains that group in the "upper left quadrant" identify those areas perceived to be highly important to overall perceptions of safety, but for which there was weak performance. These areas may be areas to prioritize for change and improvement.

3.7 Focus Groups

I engaged a community of practitioners in collaborative, reflective, and active exploration of patient safety in the ED, and provided a venue for voice, learning and construction of shared sense making. The purpose of the focus group discussions was to explore in more depth in an "open communicative space" some of the overarching themes that emerged out of the interviews and survey, and to facilitate and foster the emergence of a "community of inquiry" on patient safety in the emergency department. Interaction with others is a vital ingredient in social learning where the emphasis is on collaboration, negotiation, debate and peer review. The fo-

cus groups "replicated" the cultural context in which providers and staff discuss and make sense of risk and safety. By their everyday acts of meaning, people act out social structure, affirming their own status and roles, and establishing and transmitting the shared systems of value and knowledge [500, p. 2]

3.7.1 Recruitment and Sampling

Four focus groups were conducted: one with emergency physicians, two with emergency nurses and staff, and one with staff from supporting departments such as lab and imaging. An invitation letter was sent to all staff and physicians working in the ED, and a general invitation was given at rounds and a departmental meeting. Staff members from supporting departments were recruited through their supervisors.

3.7.2 Ethics

Focus groups present a set of ethical challenges because participants cannot be granted anonymity. At the beginning of each interview, the consent form was reviewed and the participants reminded that their participation in the group was voluntary, that they could refuse to answer any question, and that they could withdraw from the interview at any time. While the members of each focus group knew the identities of the other group members, the transcripts from the focus group interviews do not contain names.

3.7.3 Data Collection

Each focus group lasted one-and-a-half hours. The sessions were conducted in a near-by meeting room off-site during the participants' non-working hours, although several non-physician participants came during work time. Refreshments and a $25 value coffee or gift card was offered as an incentive. Participants were invited to reflect on and share their overall perceptions of patient safety in the ED, how their work environment helps or hinders them in providing safe care, how they identify and assign meaning to patient safety incidents, and how they talk and learn about threats to safety in the ED. They were also invited to explore how they respond to patient safety incidents and the people who are involved with them, and what hinders them from speaking up. Group discussions were digitally recorded using a digital recorder with a multi-directional microphone. Moderators with expertise in conducting focus groups lead the discussions. The facilitators worked as a pair, while I was the observer who manually recorded supplementary data relating to the context. I did not take on the role of moderator or facilitator, but rather was a "fly on the wall". Field notes were written based on observations of the interactions amongst group members, their verbal responses as well as non-verbal reactions during the interviews.

3.7.4 Format

Each focus group began with an introduction:

> The purpose of the focus group is for me to listen to you and learn from your plural viewpoints, opinions, and experiences related to patient safety in the ED where we work. I would like to invite you to reflect on and share your overall perceptions of patient safety in the ED, how your work environment helps or hinders you in providing safe care, how you identify and assign meaning to patient safety incidents, and how you talk and learn about threats to safety in the ED. You are also invited to explore how you respond to patient safety incidents and the people who are involved with them, and what hinders you from speaking up.

The group discussions were then facilitated using a series of questions and prompts [Table 3.4]:

How do you experience patient safety in the ED?
What is your overall perception of patient safety in the ED?
What is 'safe' care in the ED?
How does your work environment influence your ability to provide safe care?
What is our patient safety story in the ED?
How would you talk about patient safety to someone new to the department?
What opportunities to improve patient safety would you like to see in the ED?
How do we create safety for patients in the ED?
Where do we succeed? Where are the gaps?
How can we learn from our own and others' mistakes?
What helps us learn? What hinders us from learning?

What is your experience of communication in the ED?
(if time) How could we encourage and engage patients to contribute to patient safety in the ED?

Table 3.4: Focus group questions and probes

Participants were encouraged to comment on, clarify or add to ideas, brainstorm strategies to implement ideas, and suggest new ideas. The goal was not to come to consensus, but rather to structure and explore diverse views.

3.7.5 Data Analysis

I read and re-read the focus group transcripts and field notes noting narrative chunks, patterns and themes, and used direct quotations from participants to illustrate themes. The data were entered into a computer software program (NVivo 8®) for coding and to ease the process of data sorting, storage and retrieval. Emergent patterns and themes were triangulated with interview and survey patient safety culture data.

3.8 Observation

Communication and shared sensemaking are central to collaborative work and creating safety. Thus, I observed the communication load and patterns of interaction in the local ED using the strategy of the Communication Observation Method [501]. I noted the following factors: the role of the participant; the number and duration of communication events, inter-

ruptions, and concurrent events; the channel and purpose of communication; interaction types; delayed or broken communications; task switches; patient levels in the hour before the observation period, and during the observation period; and the day and time.

3.8.1 Recruitment and Sampling

A convenience sample of sixteen emergency care providers and support personnel were recruited by invitation letter and a general invitation that I gave at departmental rounds and meetings. The participants were representative of different roles in the department including physicians, nurses, nurse leaders, and unit coordinators, and all had worked in the department for more than three years.

By chance, an additional nurse was observed at triage, and two nurses were observed when assigned to trauma coverage. Both of us were unaware of the nursing assignment until the time of the observation period. As it turns out, one of the nurses assigned to trauma had no trauma patient, and instead provided bedside care to two patients. This observation period took place prior to the change in duties assigned to the trauma nurse. In the past, the trauma nurse had priority assignment to the trauma room and two care spaces. If they were called into the trauma room, another nurse would cover the other two patients if needed. On the second observation period, the nurse was assigned to trauma, but the responsibilities had changed. Instead of providing bedside care to two care spaces, the

trauma responsibilities were now similar to those of a float nurse[3]. So, although unplanned on my part, observing the two trauma nurses included periods of observation of "bedside nursing" and "float nursing".

3.8.2 Ethics

I "shadowed" participants for an agreed duration (usually two hours) as they went about their normal work, taking field notes on their communication activities. My focus was not on content or style of communication, but rather the structure and process of communication, and the impact of emergency department operations on communication events.

Patients and the public were notified of the study by posted signs in the waiting areas, by letter given out at registration, and by participants. Patients were informed that their conversation with providers was being recorded, and that the recorder could be turned off or suspended at any time if they wished. Confidential material was captured during the observation, but no personal identifiers were recorded and all participant and patient identifiers were deleted from the transcript. Participants were free to suspend the recording or stop the observation period at any time, or to retrospectively exclude any recorded material. In circumstances when the patient was unable to give informed consent, participants had full control regarding stopping the recording if, in their clinical judgment, they felt the situation was not appropriate. Recordings were also suspended for

[3]Has no bed assignment; helps out where needed

personal reasons for example, phone calls and "food" or "toilet" breaks.

3.8.3 Data Collection

Participants were invited to carry a digital voice recorder in their pocket and wear a multi-directional microphone attached to their lapel while they went about their regular duties. I shadowed them and recorded field observations about the process of communication. I followed at a distance to avoid direct interference with normal work, but remained sufficiently close to observe what was occurring. I took field notes to describe the flow of events that were being observed. I did not use an *a priori* template for coding events in order to remain flexible to the dynamic of work. Initially, I wrote brief field notes as I was observing, but found that I was not able to write quickly enough to keep up with the pace of communication. I switched after four observation periods to using a digital recorder with a slide switch to dictate the time and description of what was going on.

As a provider in the department I was intimately familiar with the work area observed and the typical tasks that may occur. In some cases I was familiar with the patients being cared for since I had been the attending physician earlier. On three occasions I felt ethically obliged to speak up and provide additional background information or note a safety threat. For example, one patient presenting with shortness of breath was not on a pulse oximeter, and on another occasion the one-way valve on a thoracentesis tube was put on in the wrong direction in a patient with a

spontaneous pneumothorax.

Providers and staff were habituated to my presence as another provider in the department which allowed me to move unencumbered. Yet, being familiar perhaps also led to more conversations with me (all were deleted), or on at least two occasions, distracting me in order to tell me something.

Data collection periods were distributed over the course of the day, including evening, night and weekend periods. The purpose of communication, the type of communication channel, and the type of communication interaction were ascribed for each communication event. The number of patients (present, arriving, leaving) in the observed care area of the ED, the Canadian Triage Acuity Score (CTAS) case mix, and the number of physicians, nurses and staff working in the care area were collected from the clinical information system and the physicians and nurses schedules and shift assignments. No personal identifiers were recorded.

3.8.4 Data Analysis

The participants' conversations were transcribed verbatim and combined with transcribed field notes. I alone proof read and edited the transcripts, assigning roles to voices and deleting all personal or identifiable information. I then marked up the transcripts into communication events noting a) onset of communication in an otherwise communication free period, and b) when there was a change in purpose or channel or participants. For communication events where there was more than one other party,

the other parties were documented, but I did not consider communication with each party to be an additional communication event. I used the concept of cognitive load as my basic guide [502].

If a conversation involved three parties talking about the same topic, then I considered that to be one communication event, on the assumption that the purpose of communication was a greater determinant of cognitive load than the number of other parties. Department hand over rounds involving physicians and nurses were classified as one communication event, even though there were multiple parties and multiple locations over a period of time. If a participant was interrupted briefly, but was able to continue with their original communication task, then the interruption was coded as a new event, but the original event continued past the interruption. However, if the interruption resulted in a task switch, then resumption of the original task was coded as a new event.

Communication events were identified and described by coding the following attributes: identification number, start time, end time, role of agents involved, channel of communication, type of interaction, purpose of event, initiation, interruption or task switch, location and day/time. The data was entered into an Access®work sheet and imported into Stata 10®(StataCorp, 2007).

The channels of communication were clustered as synchronous/ asynchronous [501], and mediated/not mediated. The purpose of communication was grouped as relating to patient care, unit management, education,

social interactions or unknown. The purpose of communication relating to patient care and unit management was further subdivided by the area of patient care, such as assessment or treatment, or the area of unit management, such as equipment and supplies or housekeeping. Interruptions were further divided into on topic or off topic, as judged by relation of the content to the preceding communication. Interruptions were defined as any communication event that was not initiated by a participant and occurred during a concurrent synchronous or asynchronous event. For example, an event was coded as an interruption if a third party entered a conversation, or a second party initiated a face-to-face event while the participant was engaged in an asynchronous communication activity such as charting.

Interaction types were categorized as one or more of giving information, receiving information, giving request, receiving request, or greeting. I included greeting as a separate social category because of its relevance as an aspect of culture. Interactions were further categorized as monologic (or one-way communication) or dialogic (at least two-way communication). Common dialogic interactions included the "give request, receive information" dyad associated with looking up information.

Other parties or purpose of communication was coded as "unknown" if identification of the second parties could not be determined. For example, if a participant was documenting, then I could not always determine who else might read (communicate) with the document. Similarly,

if someone was paged overhead, then I could not determine who else had heard the page. Most of the "unknown" codes came from examples such as these.

Orders that were placed in the Patient Care Information System (PCIS) were tracked by date, time and department location to determine who the other parties were, be they a laboratory or imaging technician (investigation orders), a nurse (medication orders), or a unit coordinator (consults). This strategy turned up an additional set of communication events since many orders placed went to several different other parties at the same time.

Descriptive statistics, including point estimates and confidence intervals are reported. The data from all participants was pooled and analyzed to derive quantitative measures of: 1) the proportion of time spent in communication events for all participants; 2) the proportion of interruptions experienced by participants over all communication events; and 3) the proportion of communication events involving concurrent communication tasks. The total event time was calculated by subtracting the overlap time from the duration of individual events. The overlap time was calculated by hand to avoid double counting since many events overlapped with several successive events. The proportion of time spent in communication events was calculated as the total event time divided by the total observation time. The number of communication events per minute was calculated as an estimate of the communication load. The interruption

rate was the number of interruptions occurring as a proportion of the total communication events. Finally, the concurrent communication load was calculated by measuring the proportion of total communication time when two or more communication events overlapped in time.

3.9 Summary

I seek to explore how patient safety is created in the everyday practice of care in a hospital emergency department, and to describe how care providers and staff make sense of patient safety in their everyday interactions. My methods are sensitive to the co-construction of meaning and the "messy details" of work-as-done, while my methodological stance reflects the embedded and situated nature of practice.

Chapter 4

Safety Measures

4.1 Introduction

'Safety' is polysemous[1], 'safety culture' — problematic. Both concepts are social, and political. There are (at least) three 'safety culture' frames. First, 'safety culture' is a noun. 'Safety culture' is something a socio-technical system *has*, a system property, which, in turn, can be built, measured, and explained compared to a normative standard of "work-as-planned". I liken this model of 'safety culture' to a garden shed. It is the functionalist model most commonly associated with managers. Second, 'safety culture' is an adjective. 'Safety culture' is something a socio-technical system *is*. This is the interpretive model of academics.

Alternately, 'safety culture' is a verb. 'Safety' is a practice, something

[1]Having multiple meanings

a socio-technical system *does*, a system phenomenon that emerges out of interactions; it is a dynamic becoming or journey. 'Safety culture', in this view, is contextual and pragmatic, it can be nurtured and encouraged to grow, but can only be described and understood as "work-as-done". I liken this model of 'safety culture' to the action "to garden". This is the pragmatic model of practitioners.

In the following analysis, I use these frameworks to explore patient 'safety culture' in the everyday practice of a hospital ED. Using a functionalist frame I present results from an organizational patient 'safety culture' survey using the Patient Safety Culture in Healthcare Organizations (PSCHO) survey tool that has been modified for use in Canadian healthcare organizations[2] [497]. I compare ED unit level findings with results from the entire organization, as well as with results from another high-hazard care unit in the same organization, the Intensive Care Unit (ICU). I then benchmark the local ED survey findings with responses from other EDs across Canada using results from the PSCHO Pan-Canadian database.

Next, I present unit level survey results from the Hospital Survey on Patient Safety Culture (HSOPSC) instrument that I used in the 'quester-view' approach, and benchmark findings from the local ED with results from other ED respondents in the United States using the 2009 Agency for Healthcare Research and Quality (AHRQ) HSOPSC database.

Findings from both 'safety culture' survey instruments are then com-

[2]Commonly referred to as the Modified Stanford Instrument (MSI)

pared and contrasted, with direct comparison of identical statements. Key differences between instruments are reviewed, and a composite picture of key findings using both tools is constructed. In so doing, I demonstrate areas of similarity and difference to present a "wet finger" overview of the safety climate in the local ED.

4.2 Patient 'Safety Culture' Surveys

4.2.1 Patient Safety in Healthcare Organizations (Modified Stanford Instrument) Survey

In the fall of 2007 the healthcare organization invited physicians and staff to participate in a survey on patient safety. The invitation letter from administration stated that:

> "[organization] is committed to an environment where people feel free to contribute to building and maintaining a culture of safety. The success of this effort depends on your participation and contribution and to sharing and receiving information about safety. By filling out this [survey], you are furthering our continuing efforts to achieve a culture of safety and improve care for patients and residents. Without such a culture, the improvements in patient safety and quality that we strive for cannot occur."

The letter mentions building, maintaining, measuring and achieving — all components of the functional model.

Sample

There were 40 responses (25 percent) from the 162 eligible participants from the ED[3] who were invited by the organization to participate in the survey [Table 4.1]. The response rate was higher for nurses and staff (28 percent of 115 invited nurses and staff) than physicians (17 percent of 47 invited physicians), but this was not statistically significant (p = 0.15).

Characteristic	Number	Proportion
Role		
Emergency Nurse	20	0.50
Nurse Leader	3	0.08
Staff	9	0.23
Physician	8	0.20
Gender		
Female	27	0.68
Male	13	0.33
Job Status		
Full-time	22	0.55
Part-time	14	0.35
Causal	4	0.10

[3]Care unit or academic department at the study hospital categorized as "Emergency"

Characteristic	Number	Proportion
Age Group		
Less than 30	4	0.10
30 to 34	4	0.10
35 to 39	4	0.10
40 to 44	8	0.20
45 to 49	7	0.18
50 to 54	7	0.18
55 to 59	5	0.13
60 and more	1	0.03
Time in organization		
Less than 1 year	4	0.10
1 to less than 5 years	14	0.35
5 to less than 10 years	8	0.20
10 to less than 15 years	6	0.15
15 to less than 20 years	3	0.08
20 years and more	3	0.08
Missing value	2	0.05

Table 4.1: Characteristics of survey participants — Modified Stanford Instrument

Patient Safety Grade

Three-quarters of the participants gave the unit a "very good" (53 percent) or "acceptable" (25 percent) grade on patient safety, whereas 23 percent gave the unit a "poor" grade. None of the participants gave the unit either an "excellent" or "failing" grade. In comparison, participants tended

to be more neutral when considering the patient safety grade for the organization. A smaller proportion gave the organization a "very good" rating (34 percent), and a greater proportion gave the organization an "acceptable" rating (45 percent). The proportion of respondents who rated the organization patient safety grade as "poor" (21 percent) was similar to the proportion that rated the unit as "poor", with the majority of participants giving the unit and the organization the same grade (63 percent). One-quarter of respondents gave the unit a higher grade than the organization, whereas a smaller proportion gave the unit a lower grade (8 percent), or did not grade the organization at all (5 percent). Combining the unit and organization grades on patient safety into an overall patient safety grade resulted in a "very good" (43 percent) or "acceptable" (35 percent) impression most commonly, with approximately one-fifth of participants reporting an unfavourable impression.

Proportion of Response

In contrast to the mostly favourable overall perception of patient safety, more targeted responses to statements on the PSCHO instrument were generally negative, with an average proportion of positive scores across composites of the 7 domains of 48 percent. One-quarter of composite scores were negative or "problematic" [368, 503], and 27 percent were "neutral". Positive responses, that is, responses that agree or strongly agree with positively worded items, and disagree or strongly disagree

with negatively worded items, indicate a favourable safety climate. Conversely, problematic responses, that is, responses that agree or strongly agree with negatively worded items, and disagree or strongly disagree with positively worded items, are "inconsistent with a climate of safety" [503, p. 25].

The proportion of positive response did not exceed 75 percent on any of the domains, but did reach or exceed 50 percent on the domains VALUING SAFETY, LEADERSHIP FOR SAFETY, REPERCUSSIONS, and LEARNING CULTURE [see Table 4.2; [+] positively worded item, [–] negatively worded item]. In contrast, the proportion of positive response was less than 50 percent on the domains THREATS TO SAFETY, LEARNING RESPONSES and REPORTING CULTURE. The composite average of positive responses was significantly greater on the domain REPERCUSSIONS than on any other domain except LEARNING CULTURE ($p = 0.08$), but there was no significant difference between the composite averages of any of the domains apart from REPERCUSSIONS. Lack of a significant difference is possibly a Type II error resulting from a small sample size with a wide variance.

Three statements on the domains THREATS TO SAFETY and REPERCUSSIONS elicited positive responses from more than 80 percent of respondents, whereas 27 statements from all domains except REPERCUSSIONS elicited positive responses from less than 50 percent of participants. For 41 of the 46 statements the proportion of problematic response was equal to or greater than 10 percent, for 14 statements the proportion of problematic

response was more than 25 percent, and for 5 statements the proportion of problematic response was greater than 50 percent. Statements where the proportion of problematic response exceeded 50 percent were from the domains THREATS TO SAFETY and REPORTING. The proportion of problematic response was not significantly different on statements that were phrased as personal or those that were phrased as hypothetical or impersonal. Statements that elicited less than 20 percent positive response from participants included both personal statements and more general and impersonal statements.

	Proportion of Response, %	
Statements by domain	Positive	Problematic
Valuing safety	*39%*	*31%*
Patient safety decisions are made at the proper level of the most qualified people [+]	50%	28%
Good communication flow exists up the chain of command regarding patient safety issues [+]	43%	35%
Senior management has a clear picture of the risk associated with patient care [+]	30%	43%
Senior management provides a climate that promotes patient safety [+]	35%	33%
Senior management considers patient safety when program changes are discussed [+]	31%	23%
My organization effectively balances the need for patient safety and the need for productivity [+]	28%	38%

Statements by domain	Proportion of Response, % Positive	Problematic
Valuing safety (continued)		
I work in an environment where patient safety is a high priority [+]	60%	20%
Leadership for safety	*50%*	*22%*
My unit takes the time to identify and assess risks to patients [+]	62%	10%
My unit does a good job managing risks to ensure patient safety [+]	60%	18%
I am rewarded for taking quick action to identify a serious mistake [+]	15%	46%
My supervisor/manager seriously considers staff suggestions for improving patient safety [+]	55%	18%
Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts [–]	33%	13%
My supervisor/manager overlooks patient safety problems that happen over and over [–]	64%	10%
Threats to safety	*39%*	*43%*
I am less effective at work when I am fatigued [–]	5%	90%
Personal problems can adversely affect my performance [–]	15%	63%
Loss of experienced personnel has negatively affected my ability to provide high quality patient care [–]	16%	63%

Statements by domain	Proportion of Response, % Positive	Problematic
Threats to safety (continued)		
I have enough time to complete patient care tasks safely [+]	32%	41%
In the last year, I have witnessed a co-worker do something that appeared to me to be unsafe for the patient in order to save time [–]	41%	41%
I am provided with adequate resources (personnel, budget, and equipment) to provide safe patient care [+]	29%	60%
I have made significant errors in my work that I attribute to my own fatigue [–]	67%	18%
I believe that health care error constitutes a real and significant risk to the patients that we treat [–]	3%	83%
I believe health care errors often go unreported [–]	15%	62%
Fear of repercussions	*74%*	*7%*
Reporting a patient safety problem will result in negative repercussions for the person reporting it [–]	55%	13%
Asking for help is a sign of incompetence [–]	85%	5%
If I make a mistake that has significant consequences and nobody notices, I do not tell anyone about it [–]	88%	3%
I will suffer negative consequences if I report a patient safety problem [–]	70%	8%
Learning responses	*41%*	*19%*
Individuals involved in major events contribute to the understanding and analysis of the event and the generation of possible solutions [+]	62%	5%

Statements by domain	Proportion of Response, % Positive	Problematic
Learning responses (continued)		
A formal process for disclosure of major events to patients/families is followed and this process includes support mechanisms for patients, family, and care/service providers [+]	35%	20%
The patient and family are invited to be directly involved in the entire process of understanding: what happened following a major event and generating solutions for reducing re-occurrence of similar events [+]	18%	26%
Things that are learned from major events are communicated to staff on our unit using more than one method (e.g. communication book, in-services, unit rounds, emails) and / or at several times so all staff hear about it [+]	45%	30%
Changes are made to reduce re-occurrence of major events [+]	48%	15%
Reporting culture	*34%*	*38%*
I am sure that if I report an incident to our reporting system, it will not be used against me [+]	40%	23%
I am not sure about the value of completing incident reports [–]	36%	41%
If I report a patient safety incident, I know that management will act on it [+]	30%	28%
Staff are given feedback about changes put into place based on incident reports [+]	26%	56%

Statements by domain	Proportion of Response, % Positive	Problematic
Reporting culture (continued)		
Individuals involved in patient safety incidents have a quick and easy way to report what happened [+]	40%	40%
Learning culture	*55%*	*18%*
On this unit, when an incident occurs, we think about it carefully [+]	60%	18%
On this unit, when an incident occurs, we analyze it thoroughly [+]	40%	23%
On this unit, after an incident has happened, we think long and hard about how to correct it [+]	48%	23%
On this unit, after an incident has happened, we think about how it came about and how to prevent the same mistake in the future [+]	68%	10%
On this unit, when people make mistakes, they ask others about how they could have prevented it [+]	45%	20%
On this unit, it is difficult to discuss errors [+]	69%	13%
Average across composites	48%	25%
Unit Patient 'Safety Culture' Grade	53%	23%

Table 4.2: Proportion of response by dimensions, Modified Stanford Instrument

Only 15 percent agreed that they were rewarded for taking quick action to identify serious mistakes, and only 16 percent disagreed that the loss of experienced personnel had negatively affected their ability to pro-

vide patient care. Fifteen percent disagreed that healthcare errors often go unreported, and only 18 percent agreed that the patient and family are invited to be involved in the process of understanding what happened. Neutral responses exceeded 25 percent on 23 of the 46 statements, and were highest overall on the domain LEARNING RESPONSE. The combination of negative and neutral responses averaged 54 percent across all statements, and 52 percent across composites domain scores.

There was a trend to more favourable responses on the domain LEADERSHIP FOR SAFETY than on the domain VALUING SAFETY, but the composite domain scores were not significantly different. Just under half of participants agreed that they worked in an organization where patient safety is a high priority, but over half agreed that the department did a good job managing risks to ensure patient safety. Less than a third of participants agreed that they had adequate time or resources to complete patient care tasks safely, or that the organization effectively balances the need for patient safety and the need for productivity. Conversely, 41 percent reported that in the past year they had witnessed a coworker do something that appeared (in their opinion) to be unsafe in order to save time.

The majority of participants were either neutral or disagreed that there was a reward for action to identify mistakes, but most also disagreed that they would suffer negative repercussions for reporting, either personally or in general. However, only 40 percent expressed confidence that an incident would not be used against them if they reported it. Approximately

two-thirds of respondents either were not sure or were neutral about the value of completing incident reports, and only 30 percent expressed confidence that management would act on a reported patient safety incident. Fewer still agreed that staff were given feedback based on incident reports.

Although most participants agreed that individuals involved in a major event contribute to understanding the event and to the generation of possible solutions, most were neutral on whether a formal process of disclosure was followed that included support for patient, family, and care providers. The majority disagreed that it is difficult to discuss errors in the department, but less than half agreed that there is a thorough analysis after an incident.

Together, these collective data support the interpretation of a department operating under time pressure and staff and resource constraint that exposes patients to the risk of harm, and yet the belief that risk is generally managed to ensure patient safety. There was a perceived lack of support from senior leadership, and a belief that the balance between productivity and safety is skewed. Respondents agreed that it is acceptable to ask for help and support in order to assure patient safety and did not feel that doing so is a sign of incompetence. Although there was a general feeling that reporting mistakes and incidents will not lead to repercussions, there remained an undercurrent of fear of repercussions. More strongly, however, was a sense that reporting was of questionable value. Participants expressed futility around reporting, and disagreed that there is adequate

disclosure and learning.

Areas of Focus

Areas for focus to improve safety climate are suggested either by the proportion of positive or problematic responses, by plotting the proportion of positive response against correlation with overall patient safety grade (performance improvement grid) [497], or by modelling using ordinal regression. However, the sample size (n = 40) is not large enough to model the data statistically at the level of individual statements using factor analysis, and backwards stepwise ordinal regression did not reach convergence.

Performance Improvement Grids A plot of the proportion of positive response by domain, as well as individual items from each domain, against the correlation of domains or items with overall patient safety grade at the unit and organizational level suggests areas of focus where perceived performance is low, yet felt by respondents to be of greater importance to overall patient safety [497]. In contrast to Ginsburg et al. [497], "threshold" lines were set at 50 percent for both proportion of positive response and correlation with overall patient safety grade, in order to identify the most critical items for focus. That is, the thresholds were adjusted towards identifying the highly critical domains and items by moving the threshold for proportion of positive response lower than 70 percent, and the thresh-

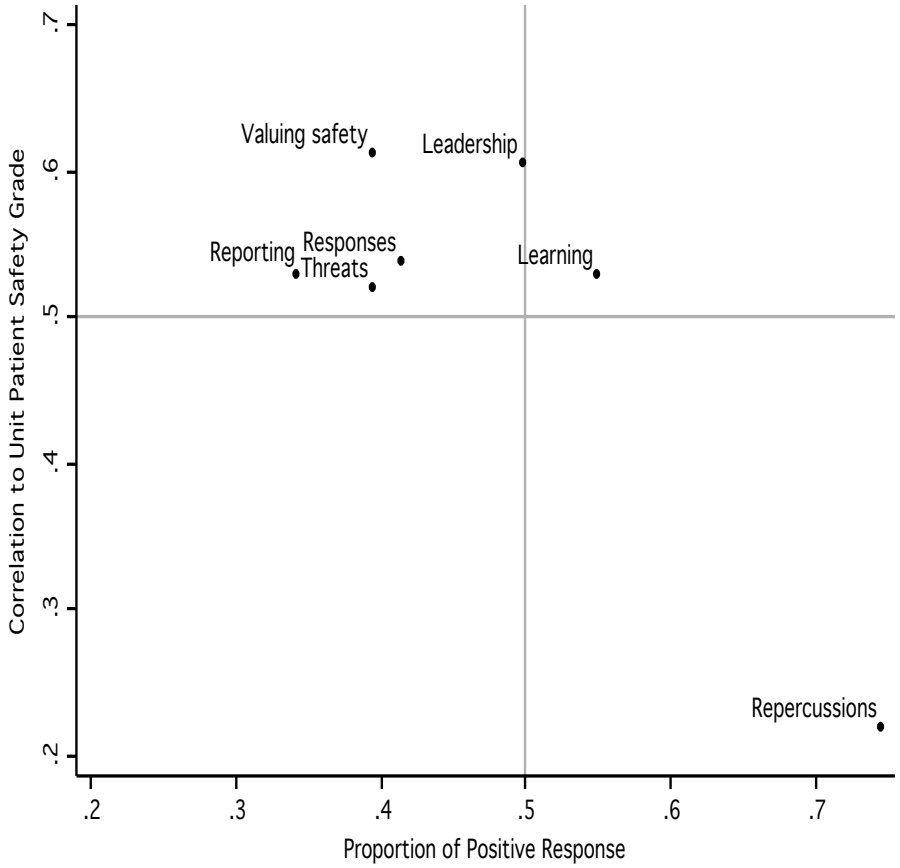

Figure 4.1: Performance improvement grid (Unit) by domain of the Modified Stanford Instrument, 2007 Version

old for correlation with overall patient safety grade higher than 30 percent [497].

Key domains identified using this approach [Figure 4.1] comparing to the unit patient safety grade are VALUING SAFETY, REPORTING, LEARNING RESPONSES, and THREATS TO SAFETY. The domains LEARNING CULTURE and LEADERSHIP FOR SAFETY plot near the threshold margins, while the

domain REPERCUSSIONS is an outlier. The same key domains are identified at the organizational level with similar relationships in comparison to the overall patient safety grade.

Key items identified comparing to the unit patient safety grade using the same approach at the level of individual survey statements are:

- "Senior management provides a climate that promotes patient safety" (VALUING SAFETY: positive response = 35%, problematic response = 33%; correlation to unit grade 0.67)
- "My organization effectively balances the need for patient safety and the need for productivity" (VALUING SAFETY: positive response = 28%, problematic response = 38%; correlation to unit grade 0.72)
- "Changes are made to reduce re-occurrence of major events" (LEARNING RESPONSES: positive response = 48%, problematic response = 15%, correlation to unit grade 0.56)

The performance grid approach indicates how safety is valued as the primary area of focus to improve patient safety in the ED. Respondents did not feel that safety is given priority over production or that safety is promoted in their workplace. Moreover, over half of respondents from the ED did not perceive that we learn enough from patient safety incidents or make changes to reduce repeat events.

Overlap between these strategies targets organizational response and learning from patient safety incidents and the balancing of safety and pro-

ductivity as the two broad areas for performance improvement on patient safety in the ED.

Differences between groups

The sample (n = 40) is small and underpowered to detect a meaningful difference of 25 percent on the proportion of positive responses between groups. Even so, significant differences were demonstrated.

Differences between nurses, physicians, and staff Significant differences were demonstrated between non-clinical staff (n = 9), nurses (n = 23), and physicians (n = 8), on the domain REPERCUSSIONS, and on statements of the survey from the domains THREATS, LEARNING RESPONSES and REPORTING [Table 4.3].

Staff trended towards more positive scores than nurses and physicians, with exceptions to statements on the domain REPERCUSSIONS, on which nurses reported significantly higher positive scores, and on the domain LEARNING RESPONSES, where physicians reported significantly more positive responses. Staff reported significantly more positive responses (71 percent) than nurses and physicians (19 percent) to the statement "I am provided with adequate resources (personnel, budget, and equipment) to provide safe patient care" (rank sum (clinical), z=2.718, p = 0.007). Non-clinical staff also reported significantly more positive responses (78 percent) than nurses and physicians (29 percent) to the statement "Individ-

uals involved in patient safety incidents have a quick and easy way to report what happened" (rank-sum (clinical), z=2.787, p=0.005).

	Proportion of Positive Responses, %			
	Nurse	Staff	MD	All
Domain	n=23	n=9	n=8	n=40
Valuing safety	38%	48%	34%	39%
Leadership for safety	52%	54%	40%	50%
Threats to safety	40%	48%	32%	39%
Fear of repercussions	82%§	69%	59%	74%
Learning responses	34%	51%	53%	41%
Reporting culture	34%	48%	20%	34%
Learning culture	57%	54%	50%	55%
Average across domains	48%	54%	41%	48%

Table 4.3: Proportion of positive responses by composite domains and staff categories

Similarly, staff disagreed (41 percent) significantly more than nurses and physicians (10 percent) with the statement that "Loss of experienced personnel has negatively affected my ability to provide safe patient care" (rank-sum (clinical), z=2.314, p=0.021). Staff agreed (57 percent) significantly more than physicians (0 percent) that they have enough time to complete patient care tasks safely (rank-sum (physician vs non-clinical), z=2.235, p=0.025), and agreed (44 percent) significantly less than physicians (88 percent) that personal problems can adversely affect their performance (rank-sum (physician vs non-clinical), z=-2.202, p = 0.028). Indeed,

staff reported significantly more positive responses overall on the domain THREATS TO SAFETY than physicians (rank-sum (physician vs non-clinical), z=2.169, p = 0.030). In short, non-clinical staff report that they feel less pressed for time, have adequate resources, do not feel significantly impacted by the loss of experienced personnel, and find reporting relatively easy. Clinicians, on the other hand, feel pressed for time in a staff and resource limited department, and do not find the process of incident reporting quick and easy.

Nurses and physicians were at opposing ends of agreement/disagreement on the domain REPERCUSSIONS, and on one statement from the domain LEARNING RESPONSES. Nurses gave significantly more positive responses overall on the domain REPERCUSSIONS than physicians and staff (rank-sum (nurse), z=-2.239, p=0.020), whereas physicians gave significantly fewer positive responses overall on the domain than did nurses and staff (rank-sum (physician), z=2.313, p = 0.021). Conversely, physicians gave significantly more positive responses (100 percent) than nurses and staff (67 percent) to the statement that "Individuals involved in major events contribute to the understanding and analysis of the event and the generation of possible solutions" (rank-sum (physician), z=-2.788, p = 0.005), whereas nurses gave significantly fewer positive responses to the statement (45 percent) than physicians and staff (82 percent) (rank-sum (nurse), z=2.522, p = 0.012). Physicians, too, gave significantly more neutral responses (38 percent) than nurses and staff (3 percent) to the state-

ment "If I make a mistake that has significant consequences and nobody notices, I do not tell anyone about it" (rank-sum (physician), z=3.537, $p < 0.001$).

From these data it appears that nurses are less fearful of repercussions, but also less likely to perceive that individuals involved in an event contribute to learning. On the other hand, physicians strongly believe that individuals involved in an event contribute to learning from what happened, but are also more ambivalent about potential repercussions. Hence, it may be that nurses are more influenced by a sense of futility than fear, whereas physicians are more conflicted about the personal stigma that may be associated with mistakes.

Physicians were significantly less likely (25 percent) than nurses and staff (77 percent) to disagree that they had made errors in their work that they attributed to fatigue (rank-sum (physician), z=2.879, $p = 0.004$). At first this appears odd since physicians work fewer hours and have shorter shifts than nurses and staff. However, it may be that personal problems and fatigue have a greater impact on the performance of emergency physicians because of the cognitive demand associated with decision making. Also, it appears from these data that physicians are perhaps more risk aware, and/or are more affected by lack of time, lack of staff and resources, fatigue and personal problems, or some combination thereof.

Differences between leaders and non-leaders Significant differences were also shown between clinical leaders (n = 4) and those not in a leadership role (n = 36) on statements from the domain VALUING SAFETY. Clinical leaders (nurses and physicians) offered a more favourable impression of senior leadership than non-leaders. Clinical leaders agreed (75 percent) significantly more than non-leaders (25 percent) that "Senior management has a clear picture of the risk associated with patient care" (rank sum leader z=-2.205, p = 0.027), and equally that the "Organization effectively balances the need for patient safety and the need for productivity" (rank sum leader z = -2.07, p = 0.038).

That clinicians and non-clinicians would perceive safety threats differently is expected, but the difference between nurses and physicians on the value of learning is somewhat surprising, given that physicians rarely if ever fill out incident reports whereas nurses do. Yet, it is physicians who strongly endorse learning from events, even if they are more ambivalent about repercussions. That clinical leaders should differ in their perception of the balance between patient safety and productivity suggests a "normalization of deviance" [136, 468] and points to a tension between work-as-planned and work-as-done.

Benchmark Comparisons

This was the first patient 'safety culture' survey in the history of the department, so there was no historical benchmark for comparison. Instead

I compared the ED to the entire organization and to another high-hazard unit within the organization (the ICU). I then compared the ED to other EDs in the PSCHO Pan-Canadian database.

Organization Overall perceptions of safety were significantly different at the organizational level (Mann-Whitney U, z = 2.41, p = 0.0161) and the unit level (Mann-Whitney U, z = 2.74, p = 0.0062) between the ED (n = 40) and the rest of the organization (n = 1327). Key differences were demonstrated under all domains [Table 4.4], and all items under the domain VALUING SAFETY scored significantly fewer positive responses in the ED sample compared to the rest of the organization ($p < 0.01$).

Perceptions of patient safety were different in the ED, with the ED participants scoring fewer positive responses on all domains, and significantly so with respect to VALUING SAFETY, REPORTING and LEARNING RESPONSES. Together these differences suggest that respondents from the ED perceived a lack of leadership support and were more than ambivalent about the value of incident reporting. They did not find it quick and easy to report, and had experienced a lack of response by management, or worse, a negative repercussion. There was no systematic department level learning involving patients, families, staff and providers. In addition, ED participants saw their workplace environment as one that is both time pressured and lacking adequate resources to provide safe patient care.

High-hazard Unit within the Organization Overall perceptions of safety at the unit level were also significantly lower in the ED (n = 40) compared to the Intensive Care Unit (n = 37) (Mann-Whitney U, z = -2.26, p = 0.0236), with key differences found under the domains of VALUING SAFETY, and LEADERSHIP FOR SAFETY [Table 4.4].

	Proportion of Positive Response, %		
	ED	ICU	All
Domain	n=40	n=37	n=1327
Valuing safety	39%	55%§	61%§
Leadership for safety	50%	60%§	61%§
Threats to safety	39%	48%	46%
Fear of repercussions	74%	82%	88%§
Learning responses	41%	44%	57%§
Reporting culture	34%	40%	57%§
Learning culture	55%	61%	66%§
Average across domains	48%	56%	62%§
Patient Safety Grade	53%	65%§	64%§

Table 4.4: Proportion of positive response by work area and safety dimension

Together these significant differences between high-hazard units within the same organization point towards the ED as a more time and resource limited environment where leadership for safety is perceived to be lacking, and patient safety overall is perceived to be worse off.

Other Canadian Emergency Departments Comparing the proportion of positive responses on the available domains in the Pan-Canadian database (VALUING SAFETY, LEADERSHIP FOR SAFETY, THREATS, REPERCUSSIONS, and LEARNING RESPONSES) between the ED sample (n = 40) and the sample of respondents from other EDs in Canada who participated in the PSCHO (n = 127) reveals no significant differences overall (Mann-Whitney U, z = -0.966, p = 0.334), [Table 4.5], but a greater than 20 point difference on the proportion of problematic responses on the items:

- "A formal process for disclosure of major events to patients/families is followed and this process includes support mechanisms for patients, family, and care/service providers" (Proportion of positive response: ED sample – 35%, Database sample – 57%)

- "The patient and family are invited to be directly involved in the entire process of understanding: what happened following a major event and generating solutions for reducing re-occurrence of similar events" (Proportion of positive response: ED sample – 18%, Database sample – 39%)

This comparison suggests that apart from the lack of a formal disclosure policy to patients and families, the ED is not significantly different to other Canadian EDs on perceptions of patient safety, and points towards there being a stronger unit effect than an organizational effect. This finding also supports the premise that EDs are different from other hospital

units [503].

	Proportion of Positive Response, %	
	ED	Database
Domain	n=40	n=127
Valuing safety	39%	44%
Leadership for safety	50%	52%
Threats to safety	39%	44%
Fear of repercussions	74%	87%
Learning responses	41%	47%
Reporting culture	34%	
Learning culture	55%	
Average across domains	48%	55%

Table 4.5: Comparison of the proportion of positive response from the ED with ED responses from the Pan-Canadian Database

4.2.2 Hospital Survey on Patient Safety Culture

In 2006, I invited ED staff, nurses and physicians, as well as hospital administrators, to explore perceptions of patient 'safety culture' in the ED with me. I used the Hospital Survey on Patient Safety Culture (HSOPSC) instrument both as a survey and as a semiotic tool. Here I present the quantitative 'questerview' survey results. Similar to findings from the PSCHO, I present key items by proportion of problematic and positive response, performance grid by domain and item, and benchmark comparison with the 2009 Agency for Healthcare Research and Quality database.

Sample

Nineteen physicians, nurses and staff from the local ED participated in a 'questerview'. An additional three administrators from the organization, and four physicians and nurses from another hospital ED participated in this phase, but here I present only the local ED survey results to compare with results from the PSCHO reported above. The sample of participants was comprised of nine nurses, including four nurse leaders, three department staff, and seven physicians. The participants were equally male or female. Three-quarters of participants had more than five years experience, while four-fifths had worked in the department for more than one year and worked more than 20 hours per week [Table 4.6]. More physicians participated in a 'questerview' than in the organizational patient safety culture survey using the PSCHO tool.

Characteristic	Number	Proportion
Role		
Emergency Nurse	5	0.26
Nurse Leader	4	0.21
Staff	3	0.16
Physician	7	0.37
Hours per week		
less than 20	3	0.16
20-39	7	0.37
40-59	9	0.47

Characteristic	Number	Proportion
Gender		
Female	10	0.53
Male	9	0.47
Time in profession		
1-5 years	5	0.26
6-10 years	6	0.32
16-20 years	2	0.11
21 years or more	6	0.32
Time in current work area		
less than 1 year	4	0.21
1-5 year	5	0.26
6-10 years	6	0.32
11-15 years	3	0.16
16-20 years	1	0.05
Time in organization		
less than 1 year	3	0.16
1-5 year	4	0.21
6-10 years	3	0.16
11-15 years	4	0.21
16-20 years	3	0.16
21 years or more	2	0.11

Table 4.6: Characteristics of survey participants — Hospital Survey on Patient Safety Culture

Patient Safety Grade

Patient safety grades ranged from "failing" to "excellent". Only 16 percent of participants thought we were doing better than "acceptable", with the majority (53 percent) giving the department a less than "acceptable" grade. Combining neutral and negative "problematic" responses (84 percent) points to the room for improvement.

Proportion of Response

The only domains to garner less then 50 percent problematic response were ACTIONS PROMOTING SAFETY, TEAMWORK WITHIN UNIT, COMMUNICATION OPENNESS, and NUMBER OF EVENTS REPORTED. A "problematic" response on the domain NUMBER OF EVENTS REPORTED was interpreted as no events reported over the past 12 months; 47 percent of participants had not reported any events. The proportion of problematic response exceeded 50 percent for all other domains.

The only domain with greater than 80 percent positive response was the domain TEAMWORK WITHIN UNIT. All participants agreed with the statement that "people support one another in this unit", and 84 percent agreed that "when a lot of work needs to be done quickly, we work together as a team to get the work done".

In contrast, the average across domain composites was 35 percent positive response [Table 4.7; [+] positively worded item, [–] negatively worded item]. Only 5 percent disagreed that "we have patient safety problems

in this unit". Fewer than 40 percent of participants gave a positive response on any of the items on the domains TEAMWORK ACROSS UNITS and HANDOFFS AND TRANSITIONS. Less than 25 percent of participants gave a positive response to the items on the domain FREQUENCY OF REPORTING. There were no positive responses to the question "when a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?"

Although the proportion of positive response was less than 50 percent on the domains OVERALL PERCEPTIONS OF SAFETY, HOSPITAL MANAGEMENT SUPPORT FOR PATIENT SAFETY, STAFFING, NONPUNITIVE RESPONSE TO ERROR, FEEDBACK AND COMMUNICATION ABOUT ERROR, and ORGANIZATIONAL LEARNING–CONTINUOUS IMPROVEMENT, the composites of these domains did not correlate highly with the overall patient safety grade.

Statements by domain	PPR[1], %
Outcome Measures	
Overall perceptions of safety	*17%*
Patient safety is never sacrificed to get more work done [+]	26%
Our procedures and systems are good at preventing errors from happening [+]	16%
It is just by chance that more serious mistakes don't happen around here [–]	21%
We have patient safety problems in this unit [–]	5%

Statements by domain	PPR [1], %
Frequency of event reporting	9%
When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?	0%
When a mistake is made, but has no potential to harm the patient, how often is this reported?	6%
When a mistake is made that could harm the patient, but does not, how often is this reported?	22%
Dimensions (Unit Level)	
Supervisor/manager expectations and actions promoting safety	*57%*
My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures [+]	26%
My supervisor/manager seriously considers staff suggestions for improving patient safety [+]	68%
Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts [–]	68%
My supervisor/manager overlooks patient safety problems that happen over and over [–]	63%
Organizational learning — continuous improvement	*39%*
We are actively doing things to improve patient safety [+]	53%
Mistakes have led to positive changes here [+]	42%
After we make changes to improve patient safety, we evaluate their effectiveness [+]	21%
Teamwork within hospital units	*84%*
People support one another in this unit [+]	100%
When a lot of work needs to be done quickly, we work together as a team to get the work done [+]	84%

Statements by domain	PPR [1], %
Teamwork within hospital units (continued)	
In this unit, people treat each other with respect [+]	79%
When an area in this unit gets really busy, others help out [+]	74%
Communication openness	*53%*
Staff will freely speak up if they see something that may negatively affect patient care [+]	68%
Staff feel free to question the decisions or actions of those with more authority [+]	42%
Staff are afraid to ask questions when something does not seem right [–]	47%
Feedback and communication about error	*18%*
We are given feedback about changes put into place based on event reports [+]	16%
We are informed about errors that happen in this unit [+]	21%
In this unit, we discuss ways to prevent errors from happening again [+]	16%
Nonpunitive response to error	*35%*
Staff feel like their mistakes are held against them [–]	53%
When an event is reported, it feels like the person is being written up, not the problem [–]	37%
Staff worry that mistakes they make are kept in their personnel file [–]	16%
Staffing	*32%*
We have enough staff to handle the workload [+]	42%
Staff in this unit work longer hours than is best for patient care [–]	16%
We use more agency/temporary staff than is best for patient care [–]	53%
We work in “crisis mode”, trying to do too much, too quickly [–]	16%

Statements by domain	PPR [1], %
Hospital management support for patient safety	*33%*
Hospital management provides a work climate that promotes patient safety [+]	32%
The actions of hospital management shows that patient safety is a top priority [+]	32%
Hospital management seems interested in patient safety only after an adverse event happens [–]	37%
Dimensions (Hospital-wide)	
Teamwork across hospital units	*24%*
There is good cooperation among hospital units that need to work together [+]	16%
Hospital units work well together to provide the best care for patients [+]	26%
Hospital units do not coordinate well with each other [–]	16%
It is often unpleasant to work with staff from other hospital units [–]	39%
Hospital handoffs and transitions	*19%*
Things "fall between the cracks" when transferring patients from one unit to another [–]	16%
Important patient care information is often lost during shift changes [–]	21%
Problems often occur in the exchange of information across hospital units [–]	16%
Shift changes are problematic for patients in this hospital [–]	22%
Average across composites	35%

Table 4.7: Proportion of positive response by dimensions, Hospital Survey on Patient Safety Culture

[1]Proportion of positive response

Areas of Focus

As with the PSHCO analysis, areas of focus were analyzed graphically using a performance improvement grid.

Performance Improvement Grids Key domains identified by comparison of the proportion of positive response to the correlation with the overall patient safety grade [Figure 4.2] were:

- TEAMWORK ACROSS UNITS (proportion of positive response = 24%; correlation to unit grade, 0.66),
- HANDOFFS AND TRANSITIONS (proportion of positive response = 19%; correlation to unit grade, 0.51); and
- FREQUENCY OF EVENT REPORTING (proportion of positive response = 9%; correlation to unit grade, 0.57)

Key items identified comparing to the unit patient safety grade using the same graphic approach at the level of individual survey statements are:

- "Patient safety is never sacrificed to get more work done" (OVERALL PERCEPTIONS OF SAFETY: proportion of positive response = 26%; correlation to unit grade, 0.72)

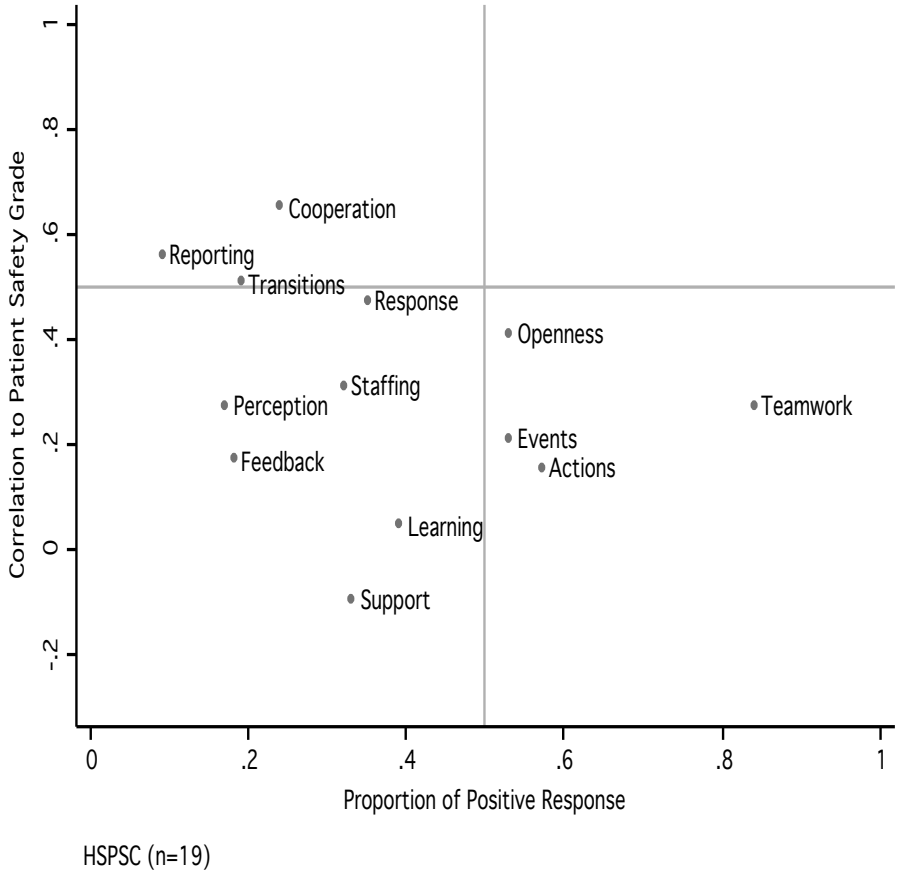

Figure 4.2: Performance improvement grid by domains on the Hospital Survey on Patient Safety Culture

- "When a mistake is made, but has no potential to harm the patient, how often is this reported?" (FREQUENCY OF REPORTING: proportion of positive response = 6%; correlation to unit grade, 0.64)

- "When a mistake is made that could harm the patient, but does not, how often is this reported?" (FREQUENCY OF REPORTING: propor-

tion of positive response = 22%; correlation to unit grade, 0.76)

- "My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures" (ACTIONS PROMOTING SAFETY: proportion of positive response = 26%; correlation to unit grade, 0.53)

- "Staff feel free to question the decisions or actions of those with more authority" (COMMUNICATION OPENNESS: proportion of positive response = 42%; correlation to unit grade, 0.67)

- "We work in "crisis mode", trying to do too much, too quickly" (STAFFING: proportion of positive response = 16%; correlation to unit grade, 0.72)

- "Hospital units do not coordinate well with each other" (TEAMWORK ACROSS UNITS: proportion of positive response = 16%; correlation to unit grade, 0.63)

- "Things fall between the cracks when transferring patients from one unit to another" (HANDOFFS AND TRANSITIONS: proportion of positive response = 16%; correlation to unit grade, 0.63)

- "Problems often occur in the exchange of information across hospital units" (HANDOFFS AND TRANSITIONS: proportion of positive response = 16%; correlation to unit grade, 0.75)

The performance grid approach points towards how safety was perceived to be primarily threatened by time pressures and the coordination of patient care across providers and units. The unit patient safety grade was positively associated with how participants felt about speaking up, and reporting errors and no harm events. Whether or not a "good word" was said in recognition of "safe" procedures was also considered to be important for perceptions of safety.

Benchmark Comparison

No significant difference between results from the local ED (n = 19) and results from ED respondents in the 2009 AHRQ HSOPSC database (n = 9703) was demonstrated on the average across composites (p = 0.1015). No significant difference was demonstrated on the domains NUMBER OF EVENTS REPORTED, TEAMWORK WITHIN UNITS, COMMUNICATION OPENNESS, and NONPUNITIVE RESPONSE ($p>0.05$), whereas the proportion of positive responses from the local ED was significantly less on all other domains [Table 4.8].

This comparison highlights two clusters of differences. Although there was no significant difference in NUMBER OF EVENTS REPORTED, near miss and no harm events were not reported, and significant differences were seen on the domains FEEDBACK ABOUT ERROR, ORGANIZATIONAL LEARNING, and ACTIONS PROMOTING SAFETY. Together, these findings suggest that there was less an issue with reporting, but more with response and

learning. The other cluster of significant differences involved perceptions of senior management and interactions across units. Responses on these domains reflect a disconnect between administration and the department, and fragmentation across units in caring for patients who present to the ED.

	Proportion of positive response, %	
	ED	2009 AHRQ
Domain	n=19	n=9703
Outcome Measures		
Overall perceptions of safety	17%	56%§
Frequency of event reporting	9%	55%§
Dimensions (Unit Level)		
Supervisor/manager expectations and actions promoting safety	57%	72%§
Organizational learning–continuous improvement	39%	65%§
Teamwork within hospital units	84%	79%
Communication openness	53%	62%
Feedback and communication about error	18%	56%§
Nonpunitive response to error	35%	37%
Staffing	32%	49%
Hospital management support for patient safety	33%	62%§

Domain	Proportion of positive response, % ED	2009 AHRQ
Dimensions (Hospital-wide)		
Teamwork across hospital units	25%	49%§
Hospital handoffs and transitions	19%	49%§
Average across composites	35%	58%

Table 4.8: Comparison of the proportion of positive response by domains on the Hospital Survey on Patient Safety Culture between the ED questerview sample and individual responses from EDs in the 2009 AHRQ database

4.2.3 Comparing Survey Findings

Placed side by side, results using the PSCHO (n = 40) and HSOPSC (n = 19) instruments provide slightly different perspectives on patient safety in the ED. First, results with the HSOPSC are more negative overall. The average proportion of problematic responses across composites was 27 percent using the PSCHO, and 65 percent using the HSOPSC. Comparing results from identical statements on both instruments (PSCHO items 39, and 29 to 32, are identical to HSOPSC items E1, and B1 to B4) also suggests this trend for unit patient "safety grade", but not for supervisory leadership. The unit level patient "safety grade" was problematic for 22 percent of PSCHO participants, but 47 percent of the 'questerview' participants using the HSOPSC. Fifty three percent of PSCHO participants gave the unit a more than "acceptable" grade, whereas only 16 percent of 'quester-

view' participants did. However, results on the domains supervisor/manager expectations and actions promoting safety/supervisory leadership for safety were not different between the two samples (average proportion of positive response on the 4 items: PSHCO – 53%, HSOPSC – 56%).

Second, comparing similar domains on the PSCHO and HSOPSC [Table 4.9], suggests that perceptions on patient safety elicited using the different instruments were similar, and possibly stable over time:

PSHCO	HSOPSC
Senior leadership support for safety (valuing safety)	Hospital management support for patient safety
Fear of repercussions	Nonpunitive response to error
Learning culture	Organizational learning–continuous improvement
Reporting culture	Feedback and communication about error

Table 4.9: Comparable domains on the PSCHO and HSOPSC

- The proportion of positive response on the domain of senior leadership support for patient safety was similar (PSCHO – 39%, HSOPSC – 33%),
- The proportion of positive response on the domain of learning was similar (PSCHO – 55%, HSOPSC – 39%; p=0.267), and
- The proportion of positive response on the domain of reporting and feedback was similar (PSCHO – 34%, HSOPSC – 18%; p=0.218).

Non-significant differences are interpreted with caution, given the sample size and variance, and failure to detect a difference may reflect a Type II error.

In contrast, fear of repercussions from reporting a patient safety incident, was higher among 'questerview' participants (PPR: HSOPSC – 35%, PSCHO – 74%; p = 0.009). This difference might be explained by a time trend, or possibly even an effect of the research. Perceptions on this domain might have changed over the almost 2 years between the start of the 'questerview' phase and the timing of the organizational patient 'safety culture' survey. Less fear of repercussions could also have contributed to the improvement in the patient "safety grade". Alternately, the differing proportion of physicians in the two samples might account for this difference. On the PSCHO instrument, physicians were significantly more likely than nurses to offer a problematic response on the domain FEAR OF REPERCUSSIONS. There were more physicians in the 'questerview' sample, and their perceptions of repercussions might weight the composite result. Finally, the difference is not likely to have been an effect of the statement wording, since both instruments used reverse worded statements on these domains.

Third, comparison of the performance grids suggests an area that was considered relevant to patient safety in the ED that did not appear on the PSCHO tool. Coordination of care across person, place and time, that is providers and units, was identified as an area of importance, and one

which 'questerview' participants felt was problematic.

In addition, the issue of leadership figured more prominently on the PSCHO compared to the HSOPSC, although the proportion of positive response on both the senior leadership and supervisory leadership were not significantly different between instruments. The difference lies in the strength of the correlation with the patient safety grade. Perceptions of senior leadership support and supervisory leadership had the highest correlations with unit patient safety grade (0.61) on the PSCHO, whereas perceptions of teamwork across hospital units had the highest correlation with unit patient safety grade (0.66) on the HSOPSC, and leadership at the departmental level and the organizational level was only weakly associated with the unit patient safety grade (Spearman $\rho \leq 0.20$).

Finally, the benchmark comparisons with other EDs point to opportunities for improvement on disclosure and learning, coordination of care across units, and leadership for safety. Put together, these two "wet finger" perspectives on the safety climate of the ED point to learning from patient safety incidents and coordination of care across transitions as the primary areas to address. The findings also highlight differences in perceptions among disciplines, hierarchies, and work areas [503]. In short, these data provide a thin description and support what is known.

The secret of the care of the patient is in caring for the patient

F.W. Peabody

Chapter 5

Safety Matters

I turn in this chapter to the findings that emerged from the semi-structured, in-depth 'questerviews' and focus groups. The chapter is divided into two main sections. In the first section I present findings by domains on the Hospital Survey on Patient Safety Culture and the overlapping themes from the group interviews. In the second section I present the major narratives that emerged across domains and in the conversations and stories about patient safety in the ED.

In using the HSOPSC as a semiotic tool within a constructivist-interpretive framework, I elicited multiple interpretive frames as participants reflected on their responses to the survey statements. I note that futility, not fear, emerged as the greatest barrier to reporting and safety learning. I reflect on stories and safety relevant issues that were not captured by the survey instruments, such as decision making and security. Using group

interview findings I further explore how ED healthcare practitioners and staff perceive patient safety. Here again I find perceptions vary between physician and nurses when considering threats to safety and potential areas for focus. I then compare practitioner perspectives with organizational artifacts, including accreditation and external review documents. I show how stories related to patient deaths in the waiting room prompted organizational learning, and how this safety issue in the local ED led to the regional Over Capacity Protocol (OCP).

5.1 'Questerviews' and Group Interviews

Here I include findings from all 'questerview' participants, including hospital administration and physician and nurse participants from another hospital [Table 5.1], as well as from focus group participants [Table 5.2], and review of organizational documents.

Characteristic	Number	Proportion
Primary work area		
Emergency Department A	19	0.73
Emergency Department B	4	0.15
Administration	3	0.12
Direct patient contact		
Yes	22	0.85
No	4	0.15

Characteristic	Number	Proportion
Role		
Emergency Nurse	7	0.27
Nurse Leader	5	0.19
Staff	3	0.12
Physician	8	0.31
Administrator	3	0.12
Hours per week		
less than 20	3	0.12
20-39	8	0.31
40-59	14	0.54
60-89	1	0.04
Time in profession		
1-5 years	7	0.27
6-10 years	7	0.27
11-15 years	7	0.08
16-20 years	3	0.12
21 years or more	7	0.27
Time in current work area		
less than 1 year	5	0.19
1-5 year	7	0.27
6-10 years	7	0.27
11-15 years	5	0.19
16-20 years	2	0.08

Characteristic	Number	Proportion
Time in organization		
less than 1 year	4	0.15
1-5 year	6	0.23
6-10 years	4	0.15
11-15 years	5	0.19
16-20 years	4	0.15
21 years or more	2	0.08
Gender		
Female	14	0.54
Male	12	0.46

Table 5.1: Characteristics of 'questerview' participants.

Characteristic	Number	Proportion
Role		
Emergency Nurse	5	0.29
Nurse Leader	2	0.12
Staff	4	0.24
Physician	6	0.35
Gender		
Female	8	0.47
Male	9	0.53

Table 5.2: Characteristics of focus group participants.

Standardized statements from the Hospital Survey on Patient Safety Culture [15] were a useful semiotic stimulus to prompt participants to reflect on and discuss their understanding of terms, concepts and perceptions related to patient safety in their everyday practice in a hospital ED. The text of the survey served as a microcosm for identification, and as a provoker for comparison [494]. I invited participants to reflect on their experience, share stories, and explore possibilities in conversation with me. Stories and narrative accounts were triggered by survey items, or following my queries and prompts, and led to rich and detailed data [483]. Nuance, ambiguity and confusion were elicited as participants explored the boundaries between real and ideal. Participants often downgraded or rarely upgraded their response upon reflection. Emphasis was on what was usual or normal, contrasting the myth of safety with the grit of everyday practice.

With rare exception, participants noted this was the first time that they had been involved in a survey or interview on patient safety. Some expressed surprise that I was not conducting the study at the behest of administration, and were more open when reassured. For others, there was hope that talking about patient safety would lead to change, for in the words of a nurse leader:

> Safety has tended to point blame and be a very judgmental process, and it hasn't been one that has been very engaging for most people to be involved with. So I think to take on the issue

> of safety is a big issue, and it's going to poke holes in a lot of people's skin because it's a tender area. [Questerview, nurse leader, lines 17-21]

For most, there was simple relief to have someone listen to their stories and concerns, which invariably were many. Most interviews went beyond the scheduled time at the urging of participants because they had more they wanted to say. In all, initiating an authentic dialogue about patient safety with my colleagues has proven to be a rich and rewarding undertaking. The conversation continues.

There was no uniform impression about the survey as a tool. Physicians and non-clinical administrators and staff, in particular, felt that many sections were not applicable to them or did not translate into what they do. One administrator noted they had lots to say, but were not sure it fit into the survey questions. Several participants questioned whether they were to comment as individuals or on the unit as a whole, or from which perspective, such as educator or clinician, they were to answer. Some found the lack of contextual background made statements difficult to interpret, or could think of competing examples that forced them to average, or neutralize, their response. More telling perhaps, were comments about their difficulty or inability to answer statements about reporting and organizational response because they either did not know what or how many events had been reported, or were unaware of safety initiatives in the organization, such as the safety intranet or *Safer Healthcare Now!* All partic-

ipants, however, noted that the statements prompted them to reflect on their experience, and although they may have had difficulty choosing a Likert-like response, they were nevertheless able to bring a story to mind.

At times, the conversation drifted to other frustrations with the system, and particularly regarding delays in care that may not always pose a threat of patient harm. Hence, there was blurring between the perception of what is "unsafe" and what was an undesired outcome.

I invited participants to begin with the area or statement on the survey they felt most strongly about, or if they had an "ah ha" moment as they went through the statements. There was no common starting point as participants worked through their responses to the survey items, but most often they began with a discussion about reporting, leadership, or teamwork, implying that these were perhaps the most salient areas. Furthermore, the pattern that emerged suggests that domains were collapsed and grouped into five main areas: overall perceptions of safety, leadership for safety, reporting and response, learning, and teamwork.

5.1.1 Overall Perceptions of Patient Safety

Overall perceptions of patient safety seemed to fall into two groups. All of the emergency physician participants, and the majority of emergency nurse participants who provided bedside care, gave the ED a "poor" patient safety grade. In contrast, participants who were in an administrative, departmental leadership, or non-clinical role gave the department an "ac-

ceptable", "very good", or even an "excellent" grade. Exceptions to this apparent division included a nursing educator and senior administrator who also gave the department a "poor" patient safety grade. Primary reasons for the "poor" overall perception centred on the perceived lack of organizational support to care for patients safely, coordination and interactions with supporting departments, and the lack of discussion and learning about patient safety threats. Most participants who rated the patient safety grade as "poor" were reluctant to give it a "failing" grade because, in the words of one physician:

> We're not failing. We provide good care every day most of the time, but I don't think its "acceptable". I don't think the status quo is anything near acceptable, and the only thing between "failing" and "acceptable" is "poor". Do I think we're actually poor? Depend[s] on the lens you use. Think about infection control, I think we're failing . . . under the conditions that we're working under, the vast majority of the patients get good care and have good outcomes, so I don't think we're absolutely failing. [Questerview, physician, lines 2362-2407]

Another physician, however, on further reflection, downgraded to a "failing" grade:

> Because we have absolutely no way to measure, we have no operational definitions of what is safe and what isn't safe, we

> haven't identified areas where our greatest opportunities for improving safety lie, we have no ability to measure a baseline of where we're at with those indicators, and we certainly have no ability and no present framework to measure any potential improvement. There's an atmosphere of anecdotal, shift-by-shift reporting and communication around safety and misses and adverse events, but there's no formal mechanism or communication strategy to spread it out to all members of the department, and certainly none to translate that into action and system changes. It just doesn't exist. [Questerview, physician, lines 840-847]

On the other hand, the nurse who proffered an "excellent" grade qualified their attribution, stating it was "not viewed as an outcome", but rather because:

> What I see is people wanting to give the best care that they can and people caring about giving the best care they can and people wanting to improve the system. [Questerview, nurse, lines 1669-1671]

Similarly, one of the nurse leaders, who gave the department a "B+" explained that:

> The reason why I gave it a B+ is because of the team. I've been here fourteen years. There's something special about this hos-

> pital. I think of it actually as a spirit. It's the energy that's here. It's like a small town hospital, but it's not. People here are warm; people are friendly. People smile at you in the hallway. And maybe also I've got that attachment because I've been here since I was a student nurse, so it's like a second home. This one is the best because of the team, and I think because of the way people pull together. [Questerview, nurse leader, lines 1612-1678]

Safety, however, is not about trying hard, nor is about measuring and counting. It is, however, about communication and action to achieve a collective sense of what is happening in order to reduce the potential of patient harm. Good working relationships offer a healthy dynamic to build from, but alone cannot counter the system constraints that "aid and abet us" [207].

Two statements about the overall perception of safety brought out differing interpretations: "Patient safety is never sacrificed to get more work done", and "It is just by chance that more serious mistakes don't happen around here". Several participants felt uncomfortable with the words "sacrifice" and "chance". They refused to believe that providers might sacrifice patient safety, or that the safety of patient care might be capricious or tenuous. They preferred to think that providers tried hard, had the patient's best interest at heart, and worked well together as a team, or trusted that the processes in place were adequate to prevent serious mistakes from

happening. Thus, they held to a professional perspective of control. Their understanding was that "chance" implied lack of responsibility more than surprise.

On the other hand, "Bullshit . . . Patient safety is sacrificed every single minute" [Questerview, nurse, lines 3047 and 3059] was the response from a nurse who went on to suggest that it was the competition for scarce resources such as space and staff in order to deliver care to a population of patients that often placed individual patients at risk. For example, a major trauma or critically ill patient, or sometimes a violent scenario, might draw resources away from other less acutely ill, injured, or aggressive patients. Nurses might be left to care for more patients in order for the department to cope.

> What happens sometimes because of the workload in the department is that nurses are pulled from areas because you have more acute patients elsewhere, so they feel unsafe with the number of patients they have. But its the temporary thing that has to be done until the crisis is dealt with. Once I was there when it was left to one nurse in the back with all the patients. "Well, this is unsafe." People get really overwhelmed, but that's going to happen. It happens because of the work environment and you don't have a lot of control over that. You do have to pull resources when you have several critically ill people that need a lot of intervention. So when it says, "Patient safety is

> never sacrificed", well, sometimes it is, but I think the patients aren't abandoned. There's someone there but the standard of care is less than what it should be and it has to happen because of the events in the department. [Questerview, nurse leader, lines 1089-1102]

This common moral and ethical dilemma in an ED hinges on a needs-based distributive justice, rather than one of equity or equality. Indeed, the principle of triage centres on this point, that scarce resources are apportioned to those most in need and who are likely to benefit. It also reflects a belief that standards ensure safety, even if, by maintaining standards, safety is then threatened by the dynamic of the department.

While it is perhaps understandable that providers involved in the direct delivery of care might have a more negative perception of patient safety than administrators and support staff who have no direct patient contact, it surprised me that clinical leaders, that is those nurses and physicians who have both clinical and leadership roles, would have a more favourable overall perception of patient safety. In spite of what I might expect is a greater understanding of departmental operations, and therefore the threats and hazards to patient care, clinical leaders, with the exception of one nursing educator, rated their overall perception of patient safety in the department as "acceptable" or "very good". Perhaps by their level of experience they have normalized the threats to safety ("happens all the time"), and/or have internalized the heroic belief of stoic fortitude

and control in the face of adversity ("we make things happen").

Three specific safety vulnerabilities were repeatedly raised in conversation. First, physical space and configuration of the department was seen by most as a significant inhibitor to communication. The physical disjointedness of the footprint contributes to fragmentation, and threatens patient safety. Having to search for people, equipment or supplies is a source of frustration and a waste of time. The second vulnerability was infection control. Attempts to provide infection control within the operating environment of the ED is a challenging task given the limitations of space, and the co-location of immunocompromised patients and Methicillin-resistant Staphylococcus aureus (MRSA) or Vancomycin-resistant enterococci (VRE) contacts. Finally, the issue of security, although not included on the survey instrument, came up across interviews and focus groups. I will return to this issue of "sanctuary" in Section 5.2.1.

5.1.2 Leadership for Safety

While no participants felt that unit management encouraged putting patients at risk for the sake of departmental flow, at the same time there was an expectation to cope, and work to keep up. Participants also did not endorse that unit management intentionally overlooked patient safety problems, although examples were given of systemic threats where action was slow or, in the case of the isolation room that did not work, consisted of waiting until the department renovation. The statement about established

patient safety procedures on the other hand elicited chuckles nearing derisive laughter.

> 'Established patient safety procedures.' What are they? (laughter) Where do I get a copy? [Questerview, nurse, line 559]

Indeed, the idea of a pat on the back for a job well done was foreign to physicians and nurses alike. Coping with the demand of seeing more people than the space was designed for, further constrained by limited staff and resources, was enough to manage.

> I've had to at different times during a shift go up to whoever was running the shift and say, "This is happening," or, "That's happening," and, "I don't feel safe," or whatever, and a lot of the response I've got is like, "Well, what do you want me to do about it?" And it's not because they don't care, but it's because they seem to be butting their heads against any assistance from above. And their exhaustion and their frustration with the system leads them to forget about patting their staff on the back and that sort of doesn't become a concern anymore because they're just trying to keep their head above water to run things and get through. [Questerview, nurse, lines 683-695]

Here again is the theme of coping, leaving limited capacity for the positive or proactive. Beyond the clinical leaders on shift, the departmental

manager articulated their belief that it is the system that is the prime contributor to patient safety events and not the person involved. There was no reward for reporting, feedback was limited, and system level analyses were rare to nonexistent. This in part because the manager has neither the training, time, nor resources to do this. Responding to incident reports is but one of many items on the table, which points to larger organizational factors and commitments.

Whereas some emergency care providers acknowledged the efforts of leadership to put programs and processes into place to support patient safety, and in particular, the recent implementation of the OCP, there remained general discontent and criticism of leadership for their lack of visibility and slowness to respond.

> You never see them physically down in the department, watching what actually happens, and yet they make these critical decisions about how we're expected to function ... Writing incident reports is definitely a necessary procedure but it's actually very limited in the results that it achieves because a lot of things really go, not ignored, but unmanaged ... And that is a huge disappointment, that it comes down in the end to money-related choices by management and administration staff where that level of safety and security provided to us is compromised. That's a disappointing thing about here, and that's one of the contributing things to my answer being "poor". [Questerview,

nurse leader, lines 285-287, 973-975, 2103-2106]

The disconnect between the articulation of patient safety as a organizational priority and the actions taken to support the provision of safe care left many perplexed and frustrated. They did not feel supported by leadership, and felt that leadership only acted in response to the patients who died in the waiting room in 2005. Conditions needed to reach crisis level before there was palpable action.

Leadership did not give priority to safety. At the time, in the view of one administrator:

> We have focussed the majority of our effort on interventions at the level of the staff and we haven't engaged the leadership and really do not have an organizational strategy or any commitment by the senior team . . . And our patient safety committee is not very effective. It's more like a clearinghouse and it doesn't really provide leadership. So I think we have lots of work to do to engage the leaders and the senior leadership team and the board in a more meaningful way. [Questerview, administrator, lines 665-676]

There have since been changes for the better, with an optimistic sense that attention is being paid to this issue, and that there is some sense of commitment from administration and leadership to understand and improve, even if results are slow in coming. Patient safety now has a higher vis-

ibility in the organizational structure, yet there remains a gap between management and care providers, and between the department and the organization.

5.1.3 Reporting and Response

There is a complete lack of systematic reporting and learning from patient safety events. There is no consistent approach, and what exists is opaque. Event reporting for threats to safety is uncommon or nonexistent. Ambiguity about what constitutes a reportable event is evidenced by the phrase "no harm, no foul".

> Does it get reported? No, it doesn't get reported. No harm, no foul. Everyone goes home. [Questerview, nurse, lines 1595-1596]

Speaking up about patient safety incidents is a critical aspect of the team learning process, but under reporting of patient safety incidents is common, and often motivated by futility or fear. "No harm" events were rarely reported, and were more commonly viewed as a personal lesson for those involved. Although learning from experience is the primary purpose of reporting [504], most learning is *ad hoc* and local, rather than systematic and organizational. Interdisciplinary departmental communication about patient safety incidents is uncommon.

Futility emerged more commonly as a reason for lack of reporting than fear of repercussions. The phrase "why bother?" was repeated across in-

terviews, and was most often heard from nurses. Lack of response from reporting is demoralizing, leading to disengagement and resignation.

> And it does something somewhere, and then either nothing happens, you see nothing, or then you think you're unimportant, so why would I bother filling out a form if I'm not important? [Questerview, nurse leader, lines 894-895]

Voice

Voice and silence in organizations are separate yet parallel multidimensional constructs [505]. The key differentiating feature is not the presence or absence of speaking up, but rather the actor's motivation to withhold or express the ideas, information, and opinions about work-related improvements that they have. Van Dyne, Ang and Botero's [505] ideal 2x3 typology also emphasizes three behaviours and motives: disengaged behaviour based on resignation, self-protective behaviour based on fear, and other-oriented behaviour based on cooperation.

By this typology, reporting of patient safety incidents falls under other-oriented behaviour based on cooperation and altruism. Speaking up to express constructive ideas for change comes from ProSocial cooperation. However, what seems to be more at play in the ED is disengaged behaviour based on resignation. Feeling unable to make a difference ("why bother?") may result from spirals of silence. Contextual variables create conditions conducive to silence, and collective sensemaking dynam-

ics create the shared perception that speaking up is unwise [506]. Reluctance to speak up, silence, or information withholding potentially undermines decision-making and error correction, and damages trust and morale [507]. Real damage occurs (both organizationally and psychologically) when employees feel unable to voice their concerns. Hierarchies restrain free communication, particularly criticisms by low-status members toward those in higher-status positions. This well documented power effect recommends against an employee-to-manager reporting structure, and suggests a peer-to-peer dynamic may be more productive for safety reporting and learning [508].

Interestingly, focus group participants expressed appreciation for the opportunity to voice, for they lack a safe place to talk, knowing they are not going to be judged. However:

> If something bad happened, as in a patient came in and shot somebody, everybody would do the thing, right, because you've got to do the thing in the moment. If somebody were to screw up, I'm not sure. It depends who it is, it depends how it happens, it depends partly on the outcome to the patient, but partly on also the impact on the department. If you . . . fuck up and make us all look bad, not so good. We may or may not support you. I'm not so sure. I think there's a lot more of the wagging tongues stuff. "Did you hear about so-and-so? Oh, dadah happened." "Well, do you know what happened?" "Well,

> that's what I heard happened." So, the gossip. The negative, bad gossip is a more common thing. [Questerview, physician, lines 407-415]

This reflection is consistent with tolerance for mistakes if perceived to be within the norm "there but for the grace of God go I", yet if perceived to be a result of bad judgement, then social repercussions may follow [509].

Incident Reports

There were 133 incidents reports involving care in the ED that were filed in 2008, with the majority originating from outside of the department (Quality Improvement, personal communication). Major categories included medication (drug, delivery, documentation, and identification), treatment and procedure (orders, execution, protocol), and transfer of care, with each comprising approximately one-fifth. Patient falls, communication and laboratory related incidents make up another one-fifth in approximately equal proportions, with the remaining 20 percent comprised of interactions with other services, security, health records, patient identification, equipment, and standards.

The general perception is that if an incident report is filled out, it would most likely be for a more concrete event such as a patient fall or a medication error like "wrong drug, wrong patient". These are by far the most commonly reported categories according to the operations leader. However, even falls might only be discussed on the unit, or documented in

the notes. Rarely, if ever, would an incident report be filed for an event where a patient had an unordered blood draw or imaging by reason of misidentification or from entering the order in the PCIS on the wrong patient. Although this potential patient safety threat happens on an almost daily basis, it is not one that is captured by the incident reporting system. In addition, diagnostic or treatment errors were unlikely to be reported as an incident, although they might be discussed at Morbidity and Mortality (M&M) Rounds if death was the outcome, or the physician involved suggested the case be reviewed for learning.

Nurses and ED staff were the only 'questerview' participants that reported filling out incident reports. None of the physician participants had filled out an incident report, although several had brought up cases at monthly M&M Rounds or had sent their patient care concerns by email to the department chair. This supports the notion that physicians are not engaged in the incident reporting mechanism, but do participate in other "reporting" channels.

There was also a difference in perception with respect to incident reports received from the wards about care in the ED. Often these were felt to be nit picky, trivial or lacking in understanding of the working conditions and constraints of the department. Examples included medications that had been ordered but not given, although the medications had not arrived from pharmacy prior to transfer, or an intravenous solution that was not as ordered, although it was the end of the solution that had been

ordered in the department. That is, instead of wasting the solution, it was left to run, although a new order for a different solution had been placed by the admitting service. Reports such as these were felt not to reflect the realities of the ED, nor were they perceived to be a threat to patients, but rather they had the flavour of a "tattletale".

The response from some clinical leaders to events like missing a medication or giving an extra tetanus shot, is suggested to be one of normalizing and minimizing, evidenced by saying, "Don't worry, it happens all the time," or "No big deal, they'll be fine; they probably needed one." There is, therefore, a threshold of response where events that are perceived to be minor or inconsequential are not worth the effort to report. Indeed, in one story recounted, a nurse witnessed a clinical leader tear up an incident report and place it in the recycling bin. What then constitutes a threat, hazard or harm worthy of reporting, and by whose judgement is it to be decided? Is it that of the reporter, or that or the responder?

> I had to hunt for an incident report when it happened [medication error] and I filled out an incident report because I was concerned ...But it was definitely not ...I don't even know where it went. The shift supervisor was like ..."nothing happened" so he signed whatever he wrote on his little comment area and then off it went. And I never heard anything about it, I never saw any changes, I have no idea ...Well, every time I've suggested something its been, "That happens here all the time.

> Don't worry about it." [Questerview, nurse, lines 442-447, 692-693]

The onus of who fills out the report is also unclear, with some suggesting it is the responsibility of the person who discovers the threat and not the person involved in the patient safety incident. However, this borders on the "tattletale", and "writing the person up". How is someone who was not involved able to describe the detail of what happened? Would it not be more constructive for learning to invite the person or persons involved to tell their story and give value to their perspective from "inside the tunnel" [2]? Little wonder that the process of incident reporting is emotionally loaded and viewed by some as ineffectual, unpleasant, and something to be avoided.

More concerning, perhaps, is the comment from the risk manager, who receives all of the estimated 250 to 400 incident reports per month from throughout the organization, who said, "I could probably count on my hands and feet the number of incident reports I get from "Emerg"." This in contrast to the departmental operations leader who suggested that incident reports were "filled out all the time." The discrepancy, it appears, is more a result of the fact that the operations leader was not forwarding all incidents reports to the risk manager as per the organizational reporting structure. The perception by several participants was that incident reports were not being attended to, or were only being dealt with at the unit level. The operations leader was seen to be very busy attending meetings, and

it may have been that incident reports were attended to "off the side of the desk" [510]. This gives credence to the argument that futility is the primary barrier to reporting because of the limited response.

Communication Openness

Many participants noted that if an order is placed, even if on the wrong patient, or for the wrong medication or dose, that "newer" staff simply would take the order and do it, rather than expressing concern or asking for clarification. There was a sense of "earning one's stripes" which allowed those with more experience to have more confidence or more liberty to speak up. As a nurse educator noted,

> Junior staff don't know what they don't know and they're also very reluctant to ask for help because they don't want people to know that they don't know something. Especially in the first six months of starting practice they will not ask for help because they don't want to show that they don't know something; they're trying to prove themselves. [Questerview, nurse leader, 174-179]

Trust, it was suggested, was a factor why they might not question or voice a concern. After all, "the doctor knows what they are doing." Clearly, setting a tone of collaboration in the interest of patient safety needs to include permission for voice, and particularly for those with less experience or power. Would that we all, as physicians, nurses and staff, acknowl-

edge our propensity and vulnerability for failure, and offer gratitude for a colleague who asks to clarify.

Closely linked was the issue of feedback. Universally, participants agreed that feedback was less than adequate. Reasons cited included the nature of a 24/7 operating environment, the lack of a departmental venue where all feel welcome, and the difficulty disseminating lessons learned. Individuals involved in an event might receive some feedback, but lessons learned would not necessarily be shared. There was no mechanism that participants felt was a useful communication channel. Although cases were discussed at M&M Rounds, a mechanism of accountability for followup of suggestions is lacking. However, as noted, M&M Rounds fail to reach the entire department and therefore have limited impact on system learning.

Although there was no overt punishment for being involved in a patient safety incident, many stories and examples suggested an undercurrent of "shame and blame" remains. Several participants spoke of their own internal discomfort and guilt they felt contributing to patient harm; feelings of self doubt they experienced were far greater threats to the integrity of self than the feedback of those around them. This points to a culture of perfectionism, and the personal effect and residue of guilt for individuals involved. For one nurse mentor, this individual response to error accounts for any sense of blame and shame in the department, and was emphatic that there was no "blame culture". Indeed for nurses in gen-

eral, there was a sense that the traditional punitive culture was a thing of the past. Incident reports were no longer kept on personnel files, although communication was still between staff and management. Nurse leaders emphasized the effort they took to place the focus on the problem and not the person involved. Yet, for the operations leader,

> One of the hardest things for me as a manager is encouraging people that it's not about people, it's about systems, and how it's our responsibility and the organization's responsibility to improve the system so that errors are minimized, or that there is something in place that they can catch them before they actually happen. So, that's been a real challenge for me. [Questerview, nurse leader, lines 19-23]

In contrast, the incident was recounted of a nurse who was involved in a medication error and subsequently was required to have someone double check their dispensing. The scenario was all the more perplexing in that the nurse reported the incident, and they were not the only one involved. Apparently a patient admitted to psychiatry, but who remained in the ED because there were no inpatient mental health beds, was escalating and required medication for control. The patient had just received their regular medication, and the attending psychiatrist, who was unaware of this, asked for an additional dose of a sedative. The nurse took the verbal order, administered the medication, and then discovered the duplication. The patient suffered no harm, and in fact the situation was controlled to

prevent harm, but the nurse involved felt that a mistake had been made, and an incident report was filed. In response, the nurse was to have someone double check all of their medication dispensing for a period of time. This was perceived as punitive and the nurse involved reportedly felt like a "bad nurse". I have no way of checking the veracity of this account, but I have no reason to disbelieve the storyteller. This would suggest that all may not be as claimed by nursing leaders.

From the experience of a nurse leader involved in responding to incident reports comes this observation about feeling "written up":

> When nurses write something, they want me to follow up. They are writing because they're uncomfortable to speak to that person directly ...None of us say, "Could we have a discussion about this because I'm a little unclear about what you were doing. I've noticed that, for example, the patient is a GI bleed and you didn't draw an INR and PTT. Can I ask you what your rationale was?" and give them an opportunity to go, "Oh, how stupid?" ...Instead they write it up for me to go to that person and then they feel like they've been tattled on. I try very hard to encourage people to speak to the person directly because I don't like that type of conflict, and yet it still ends up on my table. There probably is a bit of that, but I didn't want to make that assumption. So I sat on the fence going, I don't know, maybe some people do feel like that. [Quester-

view, nurse leader, lines 247-248, 252-259

This illustrates some of the problems with incident reporting. First, it is not only about safety, and second, it continues to have a vindictive flavour.

Just Culture

The concept of a blame-free culture presented difficulty for some who felt a need for accountability. The concern for balancing learning and accountability forms the basis for the concept of a "just culture" [511–514], but as the above scenario illustrates, there has been no agreement upon actions that cross the disciplinary line. The process of having a manager or a manager's arms-length designate respond to a patient safety incident is a process with pitfalls, and although incident reports are not kept on personnel files "99% of the time", as per the operations leader, the point remains that the relationship between reporter and responder is one potentially conflicted and distorted by dominance and power. Even without intent, isolating the individual involved can contribute to increasing shame, and does not contribute to organizational learning.

For physicians, there was appreciation that sometimes things go wrong, and it could happen to them. This was not perceived as blaming or punitive, and there was a general expression of gratitude if they were not involved, and sympathy for the person who was. On the other hand, if there was appearance of a lapse in judgement, then personal repercussions for the individual involved were more likely, and particularly so if it brought

disrepute to the department. Moreover, this judgement would not necessarily follow detailed analysis. This was not a formal reprimand, although that might occur, but more of a public shunning and threat to reputation. Too, there was the oft heard "what were they thinking?" said in a pejorative and narcissistic tone, rather than in an inquiring one. Commonly this would occur following a handoff or a transfer from another facility. If this question was asked to try and understand the view from "inside the tunnel" that would be positive, but sadly this is not always the case.

5.1.4 Learning

Innovation and learning are positive features of the department, indeed the ED has been awarded for innovations such as computer physician order entry (CPOE) and the sepsis protocol, yet there is an apparent difference between nurses and physicians with respect to learning. The physician group has a culture of learning and innovation, and there have been significant changes which have had a direct impact on care delivery. M&M Rounds are seen as a venue for learning about patient safety incidents, but are also perceived as physician-centric with limited accountability. Nurses do not have a similar venue to discuss cases, nor do they feel particularly welcome to attend monthly M&M Rounds. Either they feel their input is not valued, or they have nothing to contribute to the physician led and oriented discussion. Notably, at the time, case presentations at M&Ms were often initiated by identifying the physician involved, but none of

the other care providers, inadvertently giving the impression that the case "belonged" to the physician and not to the team of providers in the department. The case presentation might have begun: "This was a patient seen by Dr. "So and So", who by the way is the winner of the 'Dr. Kevorkian award of the month'," the latter being a dark humoured way of noting any physician who had more than one case presented at a monthly M&M Round.

By contrast, Safety Huddles, touted as a means to communicate about patient safety concerns, were perceived to be nursing-centric, and proved to be a challenge for attendance. They lasted only a few months, and dropped off for lack of interest. It was difficult for providers on shift to attend if they were actively caring for patients, or for off-shift providers to come in for a 15-30 minute meeting, a factor that highlights the communication and learning challenges of a 24/7 operating environment. Having two different venues for safety communication, one felt to be physician-centric, the other nursing-centric, and none staff-centric, or collectively-centric for that matter, speaks to the divisions in the department along professional lines, and the lack of cohesion as a community of emergency care providers.

The idea of group learning or sharing lessons from patient safety incidents is limited because there is no forum for the majority of the staff. Here lies an opportunity for improving that aspect of learning, both in building trust and visibility as well as shared communication. Having a

multi-disciplinary or interdisciplinary focus, with buy-in and ownership of all members of the department, was suggested by several 'questerview' and focus group participants as likely to have the greatest impact. This points to the relational aspect of patient safety culture and the dynamic between management and staff, and between staff themselves. A spirit of collegiality and innovation offers a base from which to "create safety".

5.1.5 Teamwork

The issue of staffing elicited varied and nuanced responses. Staffing was perceived to be less of a problem than the distribution and experience of staff, and how the available staff were being utilized. Given the variability of patient flow, staffing at times was adequate, and at other times less than adequate, with "crisis" days standing out. Physicians were annoyed by nurse and staff sick calls, and found them problematic because care spaces would be closed, further constraining space. But it was not only physicians who were affected. Nurses were also left to shoulder a greater load, which had significant impacts.

Quoting one,

> There was a period of time here when I was left alone on a very busy night; we were just short staffed. It was no one's fault, it was just what happened. But it upset me, I mean it upset me for a long time, and we're talking a month and a half I was pissed every time I came to work, and it was just the straw that

broke the camel's back. [Questerview, nurse, lines 1386-1390]

Working longer hours was more of an issue for nurses, with several questioning the value of 12-hour shifts, and many commenting that by 10-hours they are stretched. This was not agreed upon by all, and the financial benefit of this shift pattern with added overtime was suggested as a prime motivator. The local economy was suggested by one nurse as a factor as to why there was resistance to change. So while extra work was beneficial financially, eventually it led to more sick calls, and the cycle perpetuated. With a system-wide shortage of trained emergency nurses, there simply are not enough to fill the lines. That said, everyone seemed to agree that the staffing situation was worse in other departments.

"Teamwork within the unit" was the one dimension that garnered universally positive responses, with several reflecting that the support and camaraderie of their colleagues was one of the main reasons why they worked in this particular department. However, there was one caveat — the waiting room.

> We're used to running flat out, but then we get three chest pains in a row or somebody who's really sick, then for a brief period of time it's brilliant. People get moved, stuff happens, people are creative. We've got the nurses we need, they're helpful, they're sticking around, they're not running off to break. . . . When the chips do get down they pull through and it's almost a joy to be around in that setting because you feel like

> we're doing some good. Everybody's on the same page and we're working well as a team. ...But that doesn't happen on a chronic basis ...A bomb has to go off before you can get that sort of cooperation going, and the rest of the time people want to try and make our square peg fit in the round hole that's being provided to us ...On a given day when the place is in shambles and there's [sic] people vomiting or whatever in the waiting room, to say "well, we're not giving meds" as a blanket statement is really poor. The union can say what they want, and I agree there are certain safety concerns with certain medications, but refusing to start an IV and give someone an antiemetic is not valid at all. That's just being mean. I don't care what rules are around. The emergency department is a different animal from any other hospital unit because we are the interface; we have *no* control over what walks in the door. [Questerview, physician, lines 476-483, 530-532, 540, 542-543, 553-555]

The difference in collective response between emergency physicians and nurses to patients being cared for in the waiting room because of access block to nurse-monitored stretchers, was seen as a divisive and deciding watershed on the spirit of teamwork and collaboration. The space resource was limited by the number of patients admitted to hospital who remained in the ED until an inpatient bed became available. So, as the num-

ber of patients presenting to the ED for care increased, the only available space was often the hallway or the waiting room. Because waiting room space was not monitored, nurses felt uncomfortable administering medication. Moreover, there was a reluctance to exceed the nurse-to-patient ratio that had been won through negotiation. That left the care of patients lingering in the waiting room to the emergency physicians alone. At the height of the congestion, approximately one-third of patients seen on the acute side of the department were being assessed, investigated, treated and discharged without ever seeing an emergency department stretcher or a nurse other than at triage. Many a dayshift would be spent seeing every patient in a nontraditional care space and making do with what was available. This was a decidedly different way of practicing emergency medicine, one that mitigated the risk for patients waiting without knowing their condition, and yet one that not everyone was comfortable with, and particularly nurses who felt it was "unsafe".

Here, out in plain view, in the waiting room of the department, was the polysemous, political and contestable definition of 'safety'. For nurses, they perceived the risk of harm from an act of commission — administering a medication without adequate monitoring, while physicians perceived the risk of harm from an act of omission — not attending to an unstable patient in a timely way. Neither was right, nor wrong. Both views had their merits, both were attempting to mitigate risk, but the burden of waiting room care largely fell to the physicians.

> I think pre-waiting room medicine there was a different level of support. There was a greater willingness to be patient-centred for both physicians and nurses, but there's been a chasm created in terms of support with respect to the waiting room and the nurses have drawn a line in their own responsibilities not to go out there, and we obviously have decided to support patient care in the waiting room and that's probably the time when things changed ... We would like nurses or other allied health professionals to go to the waiting room or to be as patient-centred as we might view ourselves and if that doesn't happen then respect starts to turn into frustration. [Questerview, physician, lines 90-95, 154-156]

"Teamwork across units" on the other hand, was a dimension that generated more negative responses. "Handoffs and transitions" were often included in the discussion about teamwork within and across the unit, explained in part by the nature of the ED as an around the clock interface between community and hospital, and the need for cross-scale interactions[1] with diagnostic and admitting services. Whereas most providers attempt to provide the best care they can when the patient is under their care, that commitment does not seem to translate as well to the transition of care across services and the integration of care delivery between services during a patient's stay in the department. The ED does not stop and close its'

[1] Influences from below and above

doors. Weekends, evenings, and nights comprise more hours during the week than daytime weekday hours. Yet, the ED interfaces with services that do not function on the same time lines. Staffing is reduced, services are on call, and some resources may simply be unavailable. Here is one tragic story that illustrates this conflict.

> A young woman presented twice to the ED complaining of abdominal pain. Her abdominal pain apparently was non-specific with non-specific physical findings. The patient was given pain relief and discharged. She returned later with more pain and was re-examined. Her story and the physical presentation had not changed significantly, so pain management was increased and arrangements were made for the patient to have an ultrasound. The second visit took place during the night on a Friday and the requisition for the ultrasound was placed in the computer as a routine, anticipating that it would happen on the weekend. The patient was instructed to follow up within 12 hours if they had not been informed to return for an ultrasound. However, the ultrasound did not happen on the weekend, and the patient did not return to the department. When the ultrasound was performed on Monday, the impression was that she had an ovarian torsion. Gynecology was consulted and the patient underwent a laparoscopy, but unfortunately the ovary was necrotic and had to be removed.

This story was presented at M&M Rounds by the physician who saw the patient on the Friday night. Hindsight being what it is, there was frustration on their part because they felt perhaps they could have done better (such as phone the radiology resident and speak with them directly) and yet felt impeded because of the structure and processes of care within the hospital. This was a hard lesson to learn, but pointedly heightens the importance of direct communication in order to bridge gaps within the system. Had the patient presented at 9AM on a Tuesday morning, for example, the ultrasound would likely have been performed within 2 hours and the outcome might have been different.[2]

This story illustrates the interactions between providers and departments that are the *sine qua non* of a an ED. A patient presents and is assessed. They require an investigation and perhaps a consultation. Other departments are involved, usually the laboratory or diagnostic imaging, but perhaps ECG, respiratory therapy, or social work. There is 24-hour coverage from the lab and ECG, but imaging such as computerized tomography or ultrasound require the availability of a resident, who may not be in-house, and would prefer to postpone the investigation until morning if possible. The consulting service may or may not have a resident or a student, or they might be on home-call, possibly across town at another hospital,[3] or scrubbed in the operating room, or may be attending another

[2]The overall salvage rate for an ovarian torsion is about 10%, primarily because of delay in diagnosis

[3]An effect of regionalization of some services

sick patient and unable to attend in a timely fashion.

The patient requires the services of the hospital, but the hospital does not always have the services readily available. It is then up to the judgement of the emergency physician to decide which patient can wait, and which patient needs more urgent attention irrespective of the hour or day of the week. But the diagnosis is uncertain, the illness dynamic. What appears to be stable at one moment, might quickly change for the worse. For some diagnoses it makes little difference whether it is confirmed in 1 hour or 1 week, but for others, time is critical, and early on it may not be straightforward to tell which is which. Not surprisingly, "Not Yet Diagnosed (NYD)" is a familiar emergency physician attachment to pain syndromes such as chest pain or abdominal pain.

The question that remains in the mind of many, is whose responsibility is the patient who has been seen and assessed by an emergency physician (who now has left), but has been referred to another service. Emergency staff are frustrated when several admitting services have been consulted but are unable to decide amongst themselves who should admit the patient. Are they a medicine patient or a cardiology patient or a surgery patient? What if they have multiple issues, no one of which meets the threshold of admission, but the sum of which recommends a stay in hospital.

Such was the case of an elderly victim of assault who suffered multiple bruises, lacerations, and non-operative fractures, yet lived alone and

lacked social support. The patient was left in the ED because the orthopaedic service would not admit if no surgery was required, and the medicine service would not admit them without a medical problem, and although it was neither safe nor humane to discharge this patient, the problem-oriented, and provider-oriented organization did not address the patient-centred need and treat them "How you want to be treated".

If patients have a psychiatric illness, require mental health certification, and yet also have a medical condition that requires hospitalization, they "cannot" be admitted to the ward while they are certified under the Mental Health Act because they need a "sitter". Also, if patients' vitals signs are not within strict parameters, but they are not sick enough to require intensive care, then they become "Medical Exceptions to Transfer (MET)" and remain in the ED where they can be more intensely monitored than on the ward. The organization does not have a step-down unit to manage this patient need. Although the MET strategy was devised in the interest of patient safety, these patients are in effect in limbo, housed in the ED under the care of an inpatient service until such time as they improve or deteriorate to the point of requiring intensive care.

> I don't know what you people are going to do with me. I'm too sick to go to medicine and not sick enough for ICU. [patient under a MET]

Either of these practices add to the brittleness of the ED, and effectively perpetuate access block, prolonged ED length of stay, and more frequent

implementation of OCP.

> So the acuity is ever increasing in the community. The inexperience of ward nurses is ever increasing. So, we're like . . . and exception to transfer, it's just like . . . we're undoing the work that we've done with OCP, right? I mean, the acuity of patients that we send up to the wards is high, but why not increase the resources up there? You know, not log jam it down here. People are very, very, very frustrated with it down here. It's this SBAR thing, you know? Making sure that the patient's basically ready for discharge before they're sent up to the ward, you know? That there's nothing wrong, they can be managed for at least a couple of hours without having a professional set their eyes, you know, that they're that stable, right? People are really frustrated with it and also, they feel that our judgment's being called into ?(question)?. And what we think is, what we deal with and what our comfort level is and, you know, the work that we've done to get them ready and they're saying, "No, no, no, no." They have to have . . . And there's actually a checklist coming out now, you know? Cannot have respirations above 18. Heart rate cannot be above 90. There is a checklist and if they don't meet that criteria, they don't go up. [Triage Nurse]

Yet, this is a hospital. When did the hospital lose the mandate to care for

sick people? The ED is not the only place in the organization that cares for sick people. Somehow, in the interest of 'safety', we have decided not to put sick people on floor wards in order to keep them 'safe', but to keep them in the ED where they can be monitored — effectively creating a safety threat in ED in the form of access block. These are all features of the geographic fragmentation of hospital care.

> There are too many silos. There are too many divisions and from the patient's standpoint, they don't give a shit. They don't care whether they are under this admitting service or this team. We talk about the patient's journey, but because the system is still very provider-focussed, and not customer-focussed, everyone in their silos have all these rules and systems that mostly support the provider function. The patient's floating in between these silos and often it's not to the patient's benefit. We don't integrate very well within the hospital. Even within the acute care stay of a patient, it's not well integrated. Certainly connecting with pre-hospital and post-hospital in the community, we do that very, very poorly. [Questerview, physician, lines 235-244]

There is no sense of the patient as the healthcare system's patient, or the organization's patient, or the department's patient, or even the team's patient. We treat patients as individual practitioners, and refer to them in the

individual possessive "my/your" rather than the collective "our". The mindset is fragmented, local, and reductive.

> I think we all work as individuals. This is my patient; I'm responsible for this patient…it's not the "hospital's patient" or not the "team's patient". [Questerview, physician, lines 1010, 1017]

The risk manager noted that while few incident reports come from the ED, many incident reports are filed about ED care, and the impressions are not "favourable". I have mentioned already the delays or absence of medication delivery which may or may not be a consequence of busyness, but the other group of reports have the theme that the ED passes on the information they want the wards to know, and not necessarily the information the ward needs to know. Most concerning was that infection precautions for MRSA or VRE were apparently not being passed on, and the information not being discovered until after patients were already settled into an open ward bed without the necessary steps for isolation being taken. The perception was that this information was being intentionally withheld in order to move patients faster. I can only imagine that it is born out of frustration and need to free up space for patients in the ED, rather than any malicious intent to deceive. This concern speaks to the dynamic between the ED and the inpatient wards. The Over Capacity Protocol benefits the ED at the "expense" of the wards, whereas traditionally the ED has suffered for the "benefit" of the wards. The organizational realignment to

decongest the ED has been interpreted by some on the wards as "helping out the ED", rather than pulling admitted patients to the most appropriate inpatient setting. The antagonism rises out of the stress of coping with limited resources. Staff are maxed. Anything extra fosters frustration, anxiety, and anger.

> What I find surprising is that we're in an enterprise to improve people's health and well being and yet sometimes the staff that work in this environment are less than caring and open in terms of communication between each other. Everyone's overworked and stressed, but you know as well as I do how many unpleasant conversations you've had with various other groups because you're just trying to get your job done and do the best for a patient. It always surprises me why is it that — and this is a common problem everywhere — that we're in an institution that has these very altruistic goals of trying to help people's health and wellness and yet we are often fighting with each other? We're screaming at each other sometimes and disrespectful of each other sometimes. I don't have any experience with other industries, but it seems shocking that healthcare sometimes is such an adversarial environment. I'm sure that affects patient care. [Questerview, physician, lines 201-207]

5.1.6 Comparisons

Comparisons across time and space were made by several participants, looking either to times past, or other hospitals or countries where they had worked, to inform their perception of their current work environment. Invariably, things were better then or there, with the exception being that everyone thought they were better off than at any other local department. Comparatively, case complexity and violence were felt to be on the increase, and security concerns were more prominent. A decade ago the department was smaller, more of the same personnel worked with each other, patients were less violent, and the system and resources were not as strained. Now, however, communication and collegiality has deteriorated. Staff cohesion is felt to be worse off, and outsourcing of support services is thought to diminish commitment to the department. As the nature of emergency work becomes more complicated, staff are feeling more fragmented and fearful. Staff turnover is thought to be more common than in the past. Of note, of the nineteen participants from the local emergency department who participated in the 'questerview' phase (excluding the organizational administrators and the care providers from the second hospital), twelve have since changed roles, have significantly reduced the amount of time that they are in the department, have moved onto other roles in the organization, or have moved away. This transient nature of ED staff poses a challenge for creating a safety culture.

Exploring the differences between a more "developed" patient safety

culture and organizational processes in Australia and experiences here in Canada, suggests that we have not yet matured as healthcare organizations. Patient safety is not yet part of the way we do things. What is done is done on a more informal and non-systematic level. The measure of reporting, including near misses and adverse events, in Australia is routine whereas within the short period of time one participant has worked in Canada has already been marked by frustration and a sense of futility with reporting because there appears to be no feedback.

5.1.7 Gaps in the Instrument

Several themes emerged in the interviews and focus groups that were not contained in the survey tools. Specifically, concerns about cognition and decision making was important for physicians, while concerns about security was important for nurses.

Physicians drew attention to the importance of cognition and cognitive errors, diagnostic errors, and the need to free up clinical decision-makers to make safe decisions, instead of cluttering their cognition with maintenance or managerial tasks. They were interested in the role of technology and/or system structures and processes that could help minimize their cognitive load.

> If you're using all your CPU calculation time [*note the computer model of cognition*] to do a lot of maintenance functions, then you have less capacity to be actually making a lot of the bigger

> clinical decisions you're making. And you feel that on shift sometimes, that the fact that you are the only one that's keeping track of whether this test was done or not done, or whether this was done ... And you find it cluttering your head when you really should be thinking "What's the probability of this person having this disease and what should I be doing?" " [Questerview, physician, lines 378-385]

Many participants noted that they did not feel safe in their workspace. This theme was present across interviews and focus groups, and is particularly relevant to the population that we serve. Staff often felt unsupported, which not only affected their own sense of safety, but also affects staff retention. Perhaps staff need to feel safe in order to create safety. This recurrent theme forms part of the "sanctuary" safety narrative [see Section 5.2.1].

5.1.8 Reflective Changes

As I have already alluded to, some participants downgraded, or on one occasion upgraded their responses upon further reflection in conversation with me. This suggests that survey statements were often ambiguous and recommends the co-constructed 'questerview'.

5.2 Narratives

Having described findings by domains of the HSOPSC, I now turn to three major narratives that emerged across domains and in the conversation and stories about patient safety in the ED.

5.2.1 Narrative: "Safety is . . . "

What is 'safety', and how is 'safety' perceived by emergency care providers and staff? This is one of the questions I posed to the focus group participants. I invited them to engage in reflective conversation about how we provide care to patients in the department, and particularly about what 'safe' care is.

I have already alluded to the polysemous and political aspect of 'safety' when I mentioned the different perspectives of nurses and physicians on what was 'unsafe' about delivering care to patients in the waiting room when no other care space was available. There is no universal and unequivocal definition of safety, but here I use "freedom from unacceptable risks" [59].

Yet, "unacceptable" and "risk" are polysemous social constructions, making 'safety' one as well. Hence, the lack of a common understanding of what comprised 'safe' care among focus group discussions with physicians, nurses, staff, and technicians is not surprising. There were multiple perspectives, with overlap. This became most evident when participants were asked to reflect on threats and hazards, and what they felt helps to

create safety in the department. My purpose in pointing out differences is not to create division, but to further understanding.

Competence

Standards For nurses and staff in one focus group, the biggest threat to patient safety was the lack of professional responsibility among nurses; they felt that the number one need was to inspire nurses to professional practice, and to shift from a culture of entitlement to pride of work. Nursing practice standards were viewed as basic nursing criteria.

In this view, 'safety' is vigilance, "being on your toes," and paying attention. Hence, the department has different 'safety' competencies on different days depending on who was working. The complexity of emergency care is increasing, with new knowledge and technology. The boundaries between emergency and critical care nursing are blurring, and critical patients are requiring medications and infusions that go beyond the training of many emergency nurses. Emergency nursing and critical care nursing are separate education programs, so emergency nurses are not often trained in critical care, but with delays in transfer of critical patients out of the ED, emergency nurses have increasingly found themselves providing care beyond their training. Resources and drug manuals are considered adequate if there is time, but not in the moment. Yet, individual ego was felt by some nurses to get in the way at times, and "I don't know" gave way to "figuring it out" or "faking my way" when equipment like fluid

warmers or rapid infusers was used. Thus, freedom to acknowledge gaps in knowledge or skills as part of professionalism was being encouraged, and training and education were emphasized, although limited by time and budget.

Leadership Concern was also expressed about the impact of nursing leadership, for, in the words of one nurse, there was a:

> real perceived lack of leadership in the department . . . there are people with titles that we rarely see in the department . . . there is a general feeling that, we're free to do whatever we want, because there's no leadership, there's no consequences for our actions. [Focus group, nurse, lines 1223-1226, 1236-1237]

There was also a sense that because of the shortage of nurses, some nurses felt they could act with impunity because they were unlikely to be fired. In addition:

> because at the hospital it seems like if you want to have anything done, it has to be documented, and staff don't want to be documenting other co-workers. And so you go to someone of higher authority, and its like, "I need this in writing. I can't do anything unless it's in writing." And staff don't want to do that, so everything sort of . . . nothing changes. [Focus group, technician, lines 1187-1191]

In short, this 'safety' narrative suggests that patient safety in the ED is threatened by lack of leadership and professional responsibility among emergency nurses.[4] It is a narrative of *competence*. Competence tends to be located within the individual, and training, education and professional bodies seek to ensure competence by examining and licensing practitioners as individuals, despite the collective nature of work. Practice standards, and education and training, are proffered as strategies for "creating safety".

Capability

For others, patient 'safety' is about performance: timely triage, care space, time to physician assessment, and time to orders for nurses, and right diagnosis, right treatment for physicians. For example, medications might be delayed or missed on one patient because nurses are caring for another critically ill patient. Hence, 'safety' is threatened by capacity and competition for resources.

Staffing Nurses and physicians alike consider nursing staff shortages and turnover to be a significant threat to 'safety'. Teamwork was fragmented and hampered during department renovations, and people were exhausted coping. The department was chaotic and in disarray. Searching for medication, supplies and equipment was taking nurses away from the bedside,

[4]This is primarily a nursing perspective, and may reflect an aspect of 'horizontal hostility' or lateral violence [515]

and "endangering" patients. Sick calls were often for a mental break.

> You have to build up a protective barrier around you because you don't know what you're going to face when you walk in, how many staff are going to be down when you walk in, how you're going to cope with the patient load when you walk in. I was the triage nurse at the front end of seeing, you know, a hundred patients maybe in your shift or 80 patients in your shift if we see 160 a day, and they're all high acuity, you've got no support at triage, and yet you're the one making the decision as to where they go. Youve got doctors down your throat, you've got no support, no help, no backup because the swing nurse isn't there, the RAZ [Rapid Assessment Zone] isn't open, and you've got a CNL [Clinical Nurse Leader] who doesn't want to hear it. And so you're up there trying to cope with all of this stuff. And I'm a pretty strong person, but holy crap, the acuity . . . like it's up there, it's a nightmare. That is unsafe. [Focus group, nurse, lines 1507-1517]

Yet, there was also the perception that:

> The biggest predictor of how many nurses are going to be there on any given day is what the weather's like outside. If it's a sunny Saturday, there are going to be beds closed in the department... Or if it's a stat day, then everybody's . . . everybody's

> available. But the only people that will be there . . . six people there on triple overtime. [Focus group, physician, lines 1393-1406]

Although physicians recognized that nurses were "playing by the rules that they are given", they were also frustrated by what they perceived as inflexibility of a culture different from their own.

Innovation

Technology Technological innovations, such as IV pumps, computerized medication dispensing, the Patient Care Information System (PCIS), and Computer Physician/Provider Order Entry (CPOE), were felt to enhance patient safety, although concern was expressed that staff were undertrained, and technological support was under-staffed.

The PCIS allows nurses and physicians to quickly retrieve past history, consultations, and tests, and to compare cardiograms, and imaging. Patient care data can be accessed quickly, from multiple locations, without waiting for charts to come from health records, or machines to print out.

I personally have experienced the benefit of this system in avoiding patient harm.

> An elderly male patient presented by ambulance with fever, dyspnea, and cough. Apart from tachypnea and fever, his vital signs were within normal limits. I met him as he was being

transferred to a stretcher by paramedics, and quickly listened to his chest. He had localized decreased air entry and dullness to percussion consistent with a consolidation in his right lung base. Before he had been hooked up to the monitor, I had arrived at a working diagnosis of pneumonia.

The story presented by the paramedics was consistent with this diagnosis, and the patient confirmed the details in breathless sentences. The patient had documented allergies to multiple antibiotics, including penicillins, macrolides, and cephalosporins. The paramedics had these allergies listed, and his allergy band was on and checked. As the intravenous was being inserted, I placed orders for imaging, nebulizers, respiratory therapy, and antibiotics — a quinolone, moxifloxacin.

I did not have another patient to be seen immediately, so I checked the PCIS for additional information. The patient had been admitted to hospital with community acquired pneumonia three months prior, and had been treated with moxifloxacin. To my surprise, he had suffered an anaphylactic reaction. This was documented in the medical chart, but was not documented on the EHS record, the allergy band, or by the patient when asked. There was no alert when the patient registered. Had I not had the time to check, it is probable that he would have received the antibiotics to which he was allergic with possible

lethal consequences. This was a near miss.

CPOE allows physicians to place orders that then go to the person responsible, rather than writing on a chart and hoping that someone looks at it. Electronic order sets provide options that constrain, but do not prescribe. That is, physicians need not follow the order options, but are free to add or subtract. Order sets and clinical pathways (see below) provide a material anchor or cognitive scaffold for shared practice, but CPOE can also tighten coupling without creating greater safety [206, 516–518].

> There are times where perhaps I personally am more reliant on it than I could be otherwise. Telling the nurse specifically what I'm thinking and what my thoughts are in terms of what the plan's going to be in the short to medium term, or what I think is wrong with the patient was more prevalent I think when we were writing down orders and specifically giving verbal orders. And there are times where we do that still but I think it's a little less likely than it used to be. [Focus group, physician, lines 1297-1303]

Process Considerable effort has been placed in creating patient care pathways and protocols for emergency patient care, and innovative care spaces such as the Rapid Assessment Zone (RAZ)[5] and the Diagnostic

[5]The Rapid Assessment Zone is a process of assessment for CTAS Level 3 patients who are considered stable enough for potential discharge, and hence do not necessarily

Treatment Unit (DTU)[6]. Pathways provide a framework for shared understanding and are thought to decrease variability and potential for suboptimal care. Order sets provide investigations and follow-up possibilities, which either "frees up brainpower" [Focus group, "less experienced" physician] or "shuts your mind down" [Focus group, "more experienced" physician] by allowing a label to be attached as if the problem has been understood. Since they are not prescribed, practitioners are "free" to make other selections, but the system "guides" choice, since the least effort is to select what is immediately presented as available. The chest pain pathway [519], sepsis protocol [520–522], and OCP [523, 524] are examples of successful process changes that have had demonstrable reductions in patient harm.

Process innovations such as RAZ and DTU, however, are dependent on staffing, and as noted above, staffing is often an issue.

> The system does break down, and not infrequently . . . if there is not enough flex, then it does not matter if you have CPOE and everyone knows what they are supposed to be doing but don't do it. [Focus group, physician, lines 409-417]

need a monitored stretcher. Assessment, diagnostic interventions such as blood work and imaging, and treatment interventions such as medication and/or intravenous fluid, can be initiated in the "rotating" 4 bed care area, and the patient then moved to a waiting area until they are reassessed, moved to an acute stretcher, or are ready for discharge.

[6]The Diagnostic Treatment Unit is a 4 bed observation unit for patients who require prolonged ED stays, but are anticipated to be discharged within 24 hours. Stable patients on diagnostic or care pathways, such as chest pain, are transferred here after their initial assessment and investigations are completed.

For this, physicians felt let down by nursing,

> There are all kinds of innovations that have been developed that nursing just doesn't come to plate to allow . . . for these innovations to come to fruition. [Focus group, physician, lines 1372-1374]

and nurses felt let down by the system.

> The system doesn't support us to do the things that we're meant to do, the things that we love to do everyday — we can't do it because the system doesn't allow for it. It's been band-aided over the years, quick fix after quick fix, and it's all falling apart. [Focus group, nurse, lines 1578-1581]

The staffing and care space inconsistency was perceived as a threat to safety, because invariably, this placed more pressure on physicians to provide care in the waiting room.

> If it's slow, you can deal with it. With any surge, [inaudible segment] the waiting room can go off, and then the waiting room care is much more haphazard. So the pressure to move a patient through a little bit faster cranks up and you may . . . you know, your threshold for discharging the patient may drop a little bit because you've just got this pressure to keep it going. So it kind of trickles through in a lot of ways. [Focus group, physician, lines 1437-1441]

This "safety as performance" narrative is grounded in everyday practice. It is a narrative of *capability*. The assumption of this 'safety' narrative is that an adequate complement of staff and resources would improve capacity and performance, and hence safety. Practitioners feel 'unsafe' when their ability to perform is stymied by system factors beyond their immediate control. Hence, 'safety' and "suboptimal" performance become blurred.

Sanctuary

Although no statement on the HSOPSC was related to security, the theme of security of person and place was repeated across care provider interviews and focus groups in response to "perceptions of safety". Managing patients in acute psychosis in a department with limited resources, was a common 'safety' theme. The feeling of not being in control, and the threat to personal safety, were "huge" factors in the stress that nurses in particular felt. There was a strong sense that patient safety went well beyond the "rights" of patient care (right medication, right dose, right time, right route, right patient, right diagnosis, right treatment), to include safety and security of the environment; not only safety between patient and provider, but also between patients.

> I had an experience when it was a really busy triage and the waiting room and there was an acute situation where we had to deal with a patient that was psychotic, acting out, so he was

> the priority for the triage nurse. But there was a guy waiting in the waiting room that actually had an MI, but he had to wait because this guy had to be dealt with first because he was the loud one and he had to be restrained, and in the meantime he's sitting there. [Focus group, nurse, lines 279-284]

Providers recounted stories of being physically and/or verbally threatened by patients, and of hearing the discomfort and fear of patients who wished to leave the ED because of the actions of other agitated and violent patients.

> There's been many occasions where things happen in the waiting room amongst the other patients, somebody who, you know is being told that they're being discharged and it's an unsafe area sometimes just sitting there waiting. And the patient's just sitting there in fear and all of a sudden there's a big scuffle in security or right on the floor in front of you and you're sitting there waiting, going, "Where do I go? What's going on in here?" And that's when it happens. And not only that, it's the verbal abuse. You could be sitting there waiting to be placed, and someone can just think you're staring at them, and some of our clientele can be very nasty. They're using some very foul language and that patient feels threatened. [Focus Group, nurse, lines 333-340]

The issue of violence resonates with emergency care providers, and attending to violence in the workplace is a particular safety priority for ED patients and staff. Violent and acting out patients present a threat to themselves, to other patients, and to providers. These concerns reflect the importance of security to the concept of patient safety in an ED. It is a narrative of *sanctuary*.

As these narratives suggest, 'safety' was sometimes used as a way to talk about other concerns, whether it be standards or staffing or security, or as leverage to garner resources.

> Everybody uses safety as really I think an excuse to get resources, and it's not part of who we are. We don't talk about safety like we talk about [things] that are ingrained in us like mission or our academic work. [Questerview, administrator, lines 668-670]

Similarly, another administrator pondered,

> What is the patient safety or patient harm story that's going to get us to this initiative that we want? [Questerview, administrator, lines 534-535]

Even so, the "flower" is still refracted "amidst the nettle". Evidence of multiple frames used with power to make sense of 'safety' forms my first 'safety' principle:

PRINCIPLE: 'SAFETY' IS POLITICAL

5.2.2 Narrative: "We Make It Happen"

Emergency care providers take pride in problem solving and coping with complexity in spite of system limitations. By working together, and helping out where needed, emergency staff, nurses, and physicians "step up to the plate". It is our culture, it is what we do. Team cohesion and communication are critical to "create safety".

> We make it happen. For example my last shift, the back was slammed with patients. It was incredibly chaotic. I heard the CNL paging twice overhead for somebody to come help get [area] cleared out. I had Security sit with the only one nurse on this side because I knew there was a second trauma. I left Security with the nurse, and went whipping over to the back, to help clear out [area] so that we could get a bed for a trauma. So I think we make it work, because we work together as a team in "Emerg". And we all help each other. And if you know somebody needs the assistance or an area, you jump in ... Despite a lot of limitations, we do make it happen. Maybe other people coming from other units, looking in, or just other disciplines or other facilities looking in on what we do on an average day, they'd probably say we're in crisis mode 24/7 ... We're used to it, and it's our culture. And it's what we do. I don't think you'd be working in emergency if you couldn't adapt to that.

> From our perspective though, I don't think we're operating in crisis mode all the time. And we're able to step up to the plate, utilize what resources we have — even though some of them are limited — and we're able to think outside of the box. And we're flexible and we're adaptable. [Questerview, nurse leader, lines 242-249, 538-540, 546-550]

But the "we" is not inclusive of others in the organization. Instead, there is an "us against them" feeling.

> The only thing that's keeping that emergency department afloat is the fact that people are there who are working so hard to actually change things because it is so unsafe . . . I think it's being held up by the people in the department with the unbelievably limited amount of resources or ability to keep things safe. [Questerview, physician, lines 1525-1527, 1657-1658]

Sensemaking

Shared sensemaking is required to build the understanding needed to inform and direct actions to eliminate the hazards that threaten patient safety [525]. Patient safety is threatened by communication and collaboration barriers that exist primarily between physicians and nurses, but also between care providers, staff and allied professionals. Physicians and nurses, by virtue of their different professional roles, often have differing

perceptions and goals for patient care. However, in the dynamic environment of an ED, there is limited time to talk.

> I certainly have heard nursing staff frequently comment in social situations outside of the work environment that they find the (name of hospital deleted) physician group is not as communicative with them at the workplace as other workplaces that they've worked at. That's a subjective feeling from our nursing staff that I suspect most of our physician colleagues don't agree with — I know I certainly don't agree with that. But, you know, hearing that over and over, there must be some truth to that. So I wonder if that's part of it, is that we've become so efficient at seeing patients in a timely fashion and taking away some of the verbal communication has prevented sometimes nursing or other staff saying ...asking us a question. So perhaps we don't really need to talk to them about anything, but because we don't talk to them about anything, they don't talk to us about anything. [Focus group, physician, lines 1309-1318]

Moreover, the work pattern of shift changes, breaks and relief for nurses, and shift changes for physicians can lead to confusion and loss of information. Consider these two quotes from a physician and a nurse, respectively.

Physician perspective:

> They don't coordinate, and it's not just about Overcapacity Protocol. I mean, if you sit and watch and listen to what happens, (1) at shift change, (2) when patients are transferred up to the wards, when report is given, when orders are replicated, it's just . . . it's frightening. I mean . . . how often are you in the "Emerg" — this is one of my pet peeves, it happens every day when I'm working on the acute side 5 to 10 times — how often will one of the following things happen: You have a discussion with the patient's nurse about what your plan is over the next 5, 10, 3 hours with the patient and within 10 or 15 minutes, a different nurse comes to you and says, "What's the plan with that patient? So what's going on with that patient?" "I just spoke to . . . " "Oh. Well, he's on break." "Didn't he tell you what I told him?" "No." That's number 1. Or then, yet a third nurse will come. I've had people come to me like 2, 3, 4 times in 20 minutes. "I've had this discussion now with 3 different nurses over the same patient. Do you guys not talk to each other?" So they're not communicating or maybe I'm just really bad at this. But, "Okay, we're going to get him up, we're going to walk test him, we're going see how he does without his oxygen, check him on the pulse ox without the oxygen, see how he does. If he maintains his pulse ox over 90, he's good to go."

> I don't know that that's really unclear, but there's an example of, "Well, what's planned with the patient?" That and asking a nurse to do something, finding out 20 or 30 minutes later that it wasn't done and that the nurse is on break and the second nurse doesn't know that you asked for that to be done. How often does this stuff happen? It happens every day. So, shift change? That's mini shift changes, they're just going on break. That's a mini shift change. [Questerview, physician, lines 744-775]

Nurse perspective:

> I admit somebody, I'm covering somebody's break; I admit the patient, the patient came in with say a chest pain issue and right-sided chest pain, cough, okay so I tell them that they are seen by the physician, the nurse whose patient it actually is initiates this, well, we want this, it's bed 8, so we found somebody with a cavitating lesion, and we swap them on, they go from bed 8 to bed 3 so they change nurses, they get seen by Medicine, they are admitted, but it's actually a pretty stable guy, so over he goes to Fast Track so we can now accommodate somebody else. In Fast Track he sees another nurse, 8:00 comes and there is another nurse and now he's going to go upstairs. Now I'm pretty sure his care is going to be adequate because

> at the best it could be, I would doubt . . . I mean you've got me, myself involved, you've got the person who had bed 8 when I was relieving them, then you go back to bed 3, that's third, maybe there was another break relief, that's your fourth RN, over to Fast Track, you don't really assign so he's probably got six nurses involved in him, and he hasn't even left our department. [Questerview, nurse, lines 2526-2543]

Responsibility for patient safety is shared by the entire healthcare system. Healthcare delivery has been described as "cooperative" sequential care with individuals responsible for a portion of the work, rather than collaborative care with shared responsibility amongst different care providers mutually engaged in a coordinated effort to solve a problem [457].

> We create part of the problem. The culture seems to be, "As soon as I've consulted a different service about a patient, I don't want to hear about it." . . . And this whole washing your hands of the whole problem, yes it takes more time on our part but I think the benefit is we know whats going on with the patient and the patients don't fall through cracks that way. [Questerview, physician, lines 210-212, 221-223]

Taking the phrase "we make it happen" to encapsulate part of the 'safety culture' of an ED, suggests that failure to relate with one another

and enact safe care together, puts patients at risk of harm. Working together in community to care for a population of patients is the "rhyme and reason" of an ED. Showing up for work and doing your own thing creates barriers to collaboration.

Safety emerges in action, something we do, not something we have. It is a dynamic. An ED is one of the most interactive and interdependent care areas in a hospital. Hence, the delivery of emergency care is relational, and 'safety culture', however defined, is most certainly relational; it is the interstitium of our interactions. It happens between us.

In addition, safety learning emerges through relationships (trust, conversation, story and collaboration), making dialogue, not simply communication, elemental to community and 'safety culture'. This forms my second 'safety' principle:

PRINCIPLE: 'SAFETY' IS ENACTED DIALOGICALLY

5.2.3 Narrative: "Anyone, Anything, Anytime"

A hospital ED is a continuous 24/7 operating environment, an open door through which may come anyone, with anything, at anytime [60, 61]. Emergency care has shifted over the past decade, with more clinical intervention, diagnostic testing, and observation care in the ED in place of hospital admission. More patients are also presenting to EDs at a time when there is a system wide staff shortage, leaving EDs crowded and over capacity [45].

A hospital ED is also an exemplar of a complex system [526]. It is a liminal space, the only continuously open door through which patients may seek help whatever the hour. No two patient pathways through an ED are identical. Emergency care providers continuously make and modify decisions and actions based on evolving information about the patient and the system. Providers respond and re-prioritize care for patients and between a population of patients as patients' conditions unfold, which necessitates flexible coordination as a team of nurses, physicians, staff, technicians, learners, and consultants.

An ED is a unique care space because it is unbounded and marked by multiple parallel and distributed tasks [300]. It is not a "mini" hospital. Events happen on a different scale. Although there is a pattern of flow over days and weeks, any given moment is unpredictable, and the department must be ready and able to respond promptly. Care providers self-organize to deliver care. Providers and staff are frequently interrupted, and must balance concurrent care to multiple patients, making trade-offs between competing priorities as they adapt to accommodate clinical demand.

> I mean, it's one of the wonderful things about the specialty is that we have to think on our feet and cope in unique ways with all sorts of things every day. I mean, no two patients are the same ever. Every day I see things I've never seen before in my life or even read about sometimes, and we have to come up with a plan. Still, I mean, they're standing there in front of

> you. And adhering to rigid rules, you know, "we never take more than four patients on as a nurse, therefore you can't put that patient in the hallway," "we don't give medications in the waiting room," "I know you just want to do this cardioversion but I have to go on my break otherwise it screws everybody else's break up" — you know this kind of thing is just frustrating. Those things are there for a reason and they work well maybe in different environments but not in ours, I think ours is unique. [Questerview, physician, lines 489-498]

There are times when the department approaches the edge of chaos, those moments when it feels like a "zoo", where there is a loss of awareness of who needs what next. There is a "surge plan" for times when the department is overwhelmed by incoming patients, and a "disaster plan" when additional resources are called in, and operations change from the everyday. I have personally never witnessed the disaster plan, but the "surge plan" is required routinely. Any afternoon and early evening, and particularly on Mondays, the department can be in a "free fall", stretched beyond its capacity to adapt, yet needing to function. It is a brittle period almost every day.

> The ambulance bay is full. The waiting room is crowded with people. There's a line up at triage. There are six patients not yet seen. Several of the response times are already an hour

over. Friday afternoon. "Free fall". It's going to be hell. Why are we so backed up? I sign into the next one to be seen and go to find the chart. No chart. I look around and ask. Where is it? Where's the patient? No one seems to know. I wander into the waiting room and call her name. No one responds. I call her name again. No response. Has she left without being seen? Perhaps the wait was too long. There is an elderly lady lying on a stretcher. I check her name band. It's her. "Hi, I'm Dr. Hunte. What brings you to hospital today?" She's not distressed or ill appearing, but she's confused and isn't sure why she's there. I examine her in the waiting room, but can't find anything obvious. I check to see if she's been to hospital before. At last, some information, but still no idea why she's here today. We'll have to find the chart.

I grab the next one. I wander back into the waiting room and call his name. He responds. He's yellow. I introduce myself. "Let's see if we can find some space for me to see you." There's one empty stretcher in the waiting room, so I ask him to lie down. "So, what's your story?" I ask. "I'm sick," he replies. No kidding. I examine him. "We'll run some tests, but it looks like your liver is in trouble. I'll try to get you into a bed as soon as we can." I order the labs and imaging. The lab arrives to draw the blood, but his middle name and birth date

are wrong. I notify admitting. They'll have to discharge him and readmit him with the correct info. I'll have to reenter all of the orders when that gets completed. "0 for 2."

Next chart. Young female: "palpitations". She's been waiting 2 hours. Vitals documented, but no ECG. Why can't this be a standing order for chest pain, syncope, and palpitations? I'm back in the waiting room. She responds and this time the chart information is correct. Her symptoms have been ongoing for 6 months. What? Why now? She'd tried to contact the Eating Disorders Program, but it was a Friday afternoon. Someone suggested she come to "Emerg". Okay, let's check her ECG and electrolytes. I write her story on the chart and place the orders. Next chart on the wall has the same name. Why are there 2 charts? What is going on here tonight? No one knows. People are running around, but no one's communicating. I've only been here for half an hour. It's time for rounds.

"Whatever it takes" was an oft heard phrase from individual and group interviews, and speaks to the adaptation and flexibility of accommodating demand — providers and staff rise to the occasion, they move patients, they get innovative, and are very good at first order problem solving [527]. System innovations such as CPOE, OCP, RAZ, DTU, and other care processes, offered support to aid providers in coping with complexity, but these were often stymied by staffing shortages.

> "Emerg" is a suboptimal environment for any kind of circumstance to happen. The nature of "Emerg" in general is [that] it is very difficult to provide the quality of care that people can in other circumstances . . . My perspective is [that] because a lot of things have been put in place from a system point of view that allow us to function better than a lot of other places do . . . the system helps us in many ways. [Focus group, physician; lines 161-170]

Yet, I wonder how much of my time is spent in running around the department looking for things like charts, supplies, personnel, or a free computer or imaging terminal. Many days the system hinders more than helps me to perform my work. How much of my cognitive load is given to dealing with frustration, looking for information, negotiating imaging or consultations, and advocating for patient care? I attempt to answer this question in the next chapter on observed communication patterns in the ED.

For every complex problem,
there is a solution that is simple,
neat, and wrong

H.L. Mencken

Chapter 6

Safety Means

In this chapter I focus on the vulnerabilities of capacity, communication, and collaboration in emergency care and point to means of 'creating safety' through dialogic sensemaking and resilience. I describe the complexity of everyday interactions using the communication observation data, and demonstrate the need for dialogic interactions and shared sensemaking. I then reflect on the brittle/resilient dynamic of an ED using an example of system resonance, and suggest directions for improving system resilience.

6.1 Dialogic Sensemaking

Good communication is an essential part of teamwork and patient safety [65, 286–288]. Communication in the ED can be chaotic [63–66, 68, 528], with multiple interruptions [70, 529, 530], transitions [291, 292], limited feedback [259, 293, 294], and communication overload. Hence, the poten-

tial for threats to patient safety from communication processes in the ED is high.

In this section I present observational findings of communication patterns in the ED to detail the interactions of everyday practice. I describe operational complexity, demonstrate multi-channel and mediated communication in an interrupt-driven environment, and note limited opportunities for dialogic sensemaking.

6.1.1 Participants

Sixteen participants, including three clinical nurse leaders, one psychiatry clinical nurse leader, two trauma nurses, two triage nurses, two unit coordinators, and six emergency physicians were observed while they performed their usual ED activities. The sample was comprised of seven females and nine males, all with greater than 3 years work experience in the ED. One of the participants was observed twice due to a recording failure.

6.1.2 Setting

Data collection took place during a 4-week period (Weeks 46 to 49, November to December 2008). Patient volumes over the period totalled 4685 patients, with an average daily volume during the observation periods of 165 (range 120 to 193). One hundred and eighty-eight patients were registered during the observation periods for an average hourly volume of 6.8 patients per hour (range 3 to 32). The hourly intake in the hour prior to the

observation periods averaged 6.3 patients per hour (range 2 to 11). This patient volume represents a 11 percent increase over the average volume during the equivalent period in the past 5 years, and a 6 percent increase over the equivalent period in the previous year (2007).

6.1.3 Sample

A total of 27 hours and 25 minutes of audio data were collected from 15 observational periods of varying duration between 50 minutes and 150 minutes. Three observation periods were conducted between 9AM and 12PM (morning: 12 percent of observation time), 6 observation periods between 12PM and 6PM (afternoon: 40 percent of observation time), 2 observation periods between 6 and 11PM (evening: 26 percent of observation time), and 4 observation periods between 11PM and 2AM (night: 22 percent of observation time). 5 observation periods were conducted on a weekend (28 percent of observation time), and 10 observation periods were conducted on weekdays (72 percent of observation time).

Recordings were suspended 12 times in 6 observation periods, for a total time of 20 minutes. The majority of suspended recording (84 percent) occurred during physician-patient interactions for reasons of patient request, physician perception that the nature of the visit was sensitive, and concern that a recording device would escalate the anxiety of a patient with paranoid schizophrenia.

6.1.4 Communication Load

A total of 3982 distinct communication events were identified in the 27-hour period. Events related to the study or involving the researcher as a party to the conversation (321 events; 2 hours, 58 minutes) were excluded, leaving 3663 events in 24 hours and 27 minutes of observation for analysis. The total observed communication time was 20 hours and 6 minutes, representing 89 percent of the observation time. Results are presented in Table 6.1.

Overall, there were 2.5 events per minute, or 150 events per hour, suggesting a new communication event on average every 24 seconds. Communication events were generally brief, with an average duration of 24.2 seconds (95% CI: 22.2 to 26.1 seconds), and a median duration of 7.0 seconds (95% CI: 6.5 to 7.5 seconds).

Triage and trauma nurses had more frequent and brief communication events compared to nurse leaders and unit coordinators. Physicians had fewer but significantly longer communication events, and spent a greater proportion of observed time in communication activity than nurse leaders, triage and trauma nurses, or unit coordinators [see Table 6.2]. Although the density of communication was high, it was taken in stride by providers and staff.

Descriptor	Nurse–Leader	Nurse–Clinical	UC	MD	TOTAL
n	4	4	2	6	16
Total observation audio time, h:mm:ss	8:17:42	5:47:02	4:02:11	9:18:31	27:25:26
Total number of communication events	1287	1024	497	1174	3982
Excluded					
Research/researcher time, h:mm:ss	0:34:20	0:55:38	0:50:09	0:38:22	2:58:29
Research/researcher events	102	73	31	115	321
Included					
Observation time in analysis, h:mm:ss	7:43:22	4:52:24	3:12:02	8:40:09	24:26:57
Communication time in analysis, h:mm:ss	6:14:09	3:49:49	2:20:39	7:41:22	20:05:59
Communication events in analysis	1185	951	466	1061	3663

Table 6.1: Summary of observed communication

Descriptor	Nurse–Leader	Nurse–Clinical	UC	MD	TOTAL
Proportion of time in communication, %	81	79	73	89	82
Event rate per hour	153.4	195.8	145.6	122.4	149.8
Event rate per minute	2.56	3.26	2.43	2.04	2.50
New event rate, seconds	23.5	18.4	24.7	29.4	24.0
Mean duration, seconds	22.4	18.2	21.5	32.8	24.2
Mean duration (95% CI)	(19.0-25.9)	(15.6-20.7)	(18.1-24.8)	(28.0-37.5)	(22.2-26.1)
Median duration, seconds	7	5	9	9	7
Median duration (95% CI)	(6.2-7.8)	(4.2-5.8)	(7.4-10.6)	(7.8-10.2)	(6.5-7.5)

Table 6.2: Summary of communication load

6.1.5 Interruptions

A total of 1513 events were coded as interruptions, resulting in a mean interruption rate of 61.9 events per hour. An interruption was classified as any new communication event that a participant did not initiate. Interruptions were short, with the majority judged to be off topic with the communication interrupted. However, off topic interruptions only accounted for 14 percent of communication time.

Triage and trauma nurses were interrupted more frequently, but had the lowest proportion of off topic interruptions. Physicians were the least frequently interrupted, but the majority of those interruptions were off topic. Unit coordinators had the highest proportion of off topic interruptions which took up 27 percent of their communication time.

Broken communication and task switches

A total of 105 communication events (3 percent) were either delayed or broken. Switches in task occurred in 2 percent of events, and were highest for clinical nurse leaders (5 percent). Task switches were noted if participants were interrupted or interrupted themselves to attend to a different task, such as picking up medication from the tube system. Switches between history taking and chart documentation by nurses and physicians were not coded as task switches since both involve "getting the story", nor was looking up different patient information in the PCIS since this was considered "data gathering".

Descriptor	Nurse–Leader	Nurse–Clinical	UC	MD	TOTAL
Interruptions	500	477	188	348	1513
Interruption proportion, %	42	50	40	33	41
Time in interruptions, %	33	34	33	10	24
Interruption event rate per hour	64.7	98.2	58.7	40.1	61.8
Mean duration, seconds	17.2	12.0	16.7	11.6	14.2
Mean duration (95% CI)	(13.0-21.3)	(9.4-14.6)	(11.7-21.6)	(8.3-14.9)	(12.3-16.1)
Median duration, seconds	5	4	4	4	4
Median duration (95% CI)	(4.2-5.9)	(3.4-4.6)	(2.5-5.5)	(3.3-4.7)	(3.6-4.4)
Off topic interruptions, %	61	47	86	68	61
Time in off topic interruptions, %	18	16	27	6	14
Concurrent events	645	497	240	603	1985
Concurrent proportion, %	54	52	52	57	54
Time in concurrent communication, %	18	25	18	26	22
Broken or delayed communication, %	5	1	2	3	3

Table 6.3: Summary of interruptions, concurrent, and broken or delayed communication

6.1.6 Concurrent Communication

Complete or partial overlap with another communication event occurred in 1985 events (54 percent), resulting in concurrent communication 22 percent of the time. This was in addition to any concurrent task not involving communication, such as procedures. Although the majority of communication events overlapped, concurrent communication did not account for the majority of communication time. Physicians and triage and trauma nurses spent a greater proportion of time in concurrent communication than clinical nurse leaders or unit coordinators.

6.1.7 Communication Channels

Over 50 distinct communication channels were identified (6 synchronous and 49 asynchronous) and grouped into four synchronous[1] and six asynchronous[2] clusters, with "other" including channels that were used less than 1 percent of the time, such as the hospital tube system [see Table 6.4]. Communication channels were further classified as non-mediated (face-to-face) or mediated, such as paper-based, telecommunication, or computer-mediated. All participants spent a greater proportion of observed time in synchronous communication than asynchronous communication, although this was higher for nurses and physicians than unit coordinators. Unit coordinators and physicians spent a greater proportion

[1] Communication occurs across channels at the same time

[2] Communication does not require parties to be active at the same time; recipients can choose when to deal with the communication

of observation time in asynchronous communication than either clinical nurse leaders or triage and trauma nurses.

The majority of asynchronous communication time was spent using computer-mediated channels. Formal paper-based channels were used in approximately equal proportions of observation time by all participants. Clinical nurse leaders and triage and trauma nurses used formal paper-based documents more often than computer-mediated communication in contrast to unit coordinators and physicians who used computer-mediated communication more often than paper-based channels. Thus, it is the difference in computer-based communication that accounts for the majority of the 2-fold difference in asynchronous communication use between nurses and physicians.

Face-to-face communication was the channel of communication 2360 times (64 percent of events), followed by overhead paging, computer systems, formal documentation, phone, information scrap — those recyclable paper-based documents that do not form part of the medical record, such as patient lists, call lists, PharmaNet, and Post-it®notes — and printer/-fax documents. The remaining 51 (1 percent) communication events involved channels such as the bedside monitor, whiteboard, and tube system, as well as the communication book, signage, pagers and answering machines, and two-way radio. In one instance, the emergency physician participant heard an incoming siren and subsequently headed towards the triage desk to greet the ambulance.

Face-to-face communication was used equally by nurses and physicians, but less so by unit coordinators. Clinical nurse leaders used the phone most frequently, followed by unit coordinators and physicians. In comparison, trauma nurses responded to bedside monitors in a roughly equivalent proportion (3 percent). Overhead paging, both sending and receiving, comprised 2 percent of clinical nurse leaders observation time, but less than 1 percent of physicians observed time. Information scrap was used more often by unit coordinators than physicians. Unit coordinators were also most likely to use fax and printer channels compared to nurses and physicians.

Overall, mediated communication channels were used during 27 percent of the observation time, with unit coordinators spending the greatest proportion of observation time using mediated communication channels, and clinical nurse leaders and triage and trauma nurses spending the least. Physicians spent almost a third of the observation period using mediated communication channels.

6.1.8 Purpose of Communication

Overall, the majority of communication events were related to patient care and unit management, with events related to education and social events making up the remainder events for which a purpose could be determined [see Table 6.5]. Thirteen percent of events were coded as purpose "unknown". This purpose category was highest for unit coordinators and

Descriptor	Nurse–Leader	Nurse–Clinical	UC	MD	TOTAL
Synchronous channels					
Events using synchronous channels, %	86	87	62	71	79
Time using synchronous channels, %	84	81	55	71	75
Proportion of observation time					
Face-to-Face, %	57	60	34	59	55
Phone, %	8.9	0.6	4.9	3.9	5
Overhead, %	2	0.9	0.9	0.5	1
Monitor, %	0	2	0	0	0.4
Other, %	0	0	0.1	0	0
Asynchronous channels					
Events using asynchronous channels, %	14	13	38	27	21
Time using asynchronous channels, %	16	19	45	29	25
Proportion of observation time					
Formal documents, %	7.1	8.2	7.1	8.7	7.9
Information scrap, %	0.6	0.6	1.2	0.2	0.6
Computer, %	33	37	67	64	54
Printer/Fax, %	0.2	0	2.6	0	0.4
Other, %	0.6	0.8	0.1	0.3	0.4

Table 6.4: Summary of channels used

lowest for physicians. The majority of these "unknown" events were related to overhead pages or computer-based communication on channels other than the PCIS. This apparent difference between roles likely relates to my ability to discern the purpose of communication, which, as a physician within the department, was less problematic when observing physicians than when observing unit coordinators.[3]

Communication related to patient care accounted for a greater proportion of communication time than unit management, whereas communication related to education and social communication occurred in equal proportions. Purpose "unknown" only accounted for 1 percent of physician communication time, but up to 18 percent of unit coordinator communication time.

The majority of communication time related to patient care was coded as "assessment and plan" (27 percent), followed by "documentation" (10 percent), "investigation" and "results" (7 percent), and "treatment" and "consultation" (6 percent each). "Comfort and support' and "discharge and follow-up" accounted for less than 2 percent of communication time overall.

Physicians had the highest proportion of communication time related to patient care, including "assessment and plan" (40 percent), "documentation" (15 percent), "results" (8 percent), and "investigation" (5 percent). Triage and trauma nurses had the highest proportion of communication

[3]Personal computer use was also categorized as "unknown".

Descriptor	Nurse–Leader	Nurse–Clinical	UC	MD	TOTAL[a]
Proportion of communication time related to patient care, %	39	61	31	86	60
Proportion of communication time related to unit management, %	61	31	39	11	34
Proportion of communication time related to education, %	0	0	2	9	4
Proportion of communication time related to social, %	1	6	11	3	4
Proportion of communication time related to unknown, %	5	3	18	1	5

Table 6.5: Summary of purpose of communication

[a]Communication events may involve more than one purpose classification so some proportions sum to greater than 100%

time related to "treatment" (13 percent), and "comfort and support" (6 percent). Triage and trauma nurses also had a similar proportion of communication time related to "consultation and handover" as unit coordinators (8 percent) and physicians (6 percent).

Clinical nurse leaders had the highest proportion of communication time related to unit management, followed by unit coordinators, triage and trauma nurses, and physicians. The majority of communication related to unit management involved "care space and location" (8 percent) and "admission, discharge, and transfer" (8 percent). That is, approximately a sixth of communication time involved looking for patients, looking for care space for patients, moving patients, or discharging patients.

Unit rounds comprised the next largest category of communication related to unit management (4 percent), followed by "staffing" (3 percent), "equipment and supplies" (3 percent), and "workload" (3 percent). Communication related to "housekeeping" or "security" accounted for 1 percent of communication time.

Physicians experienced the highest proportion of communication time related to education, with clinical nurse leaders or triage and trauma nurses together having less than 1 percent of their communication time related to education. Thus, physicians experience the highest proportion of communication time both with patients and family and with learners.

6.1.9 Interactions

Observed interactions [see Figure 6.1] demonstrate the multitude and complexity of interactions in the ED. This figure represents the interactions observed as lines between the participants (large central nodes in blue) and who they interacted with (small peripheral nodes in red). The lines only represent who was interacting with whom, and not the quantity or quality of the interactions. Interactions were categorized by type and party, with type coded as giving or receiving information or requests, as well as greeting and unknown.

Type

Interactions were almost equally split between one-way communication (46 percent), that is giving or receiving information, or giving or receiving requests, and two-way communication (50 percent) where there was give and receive of either information or requests. Information was more commonly sought or exchanged than requests.

Receiving information in either one-way or two-way communication was the most common interaction (57 percent), followed by giving information (49 percent), giving requests (38 percent), and receiving requests (25 percent). Greetings accounted for 3 percent of all interactions, while 1 percent of interactions were "unknown", either because the communication was inaudible (overhead or phone) or could not be determined (computer). Unit coordinators experienced the highest proportion of one-way

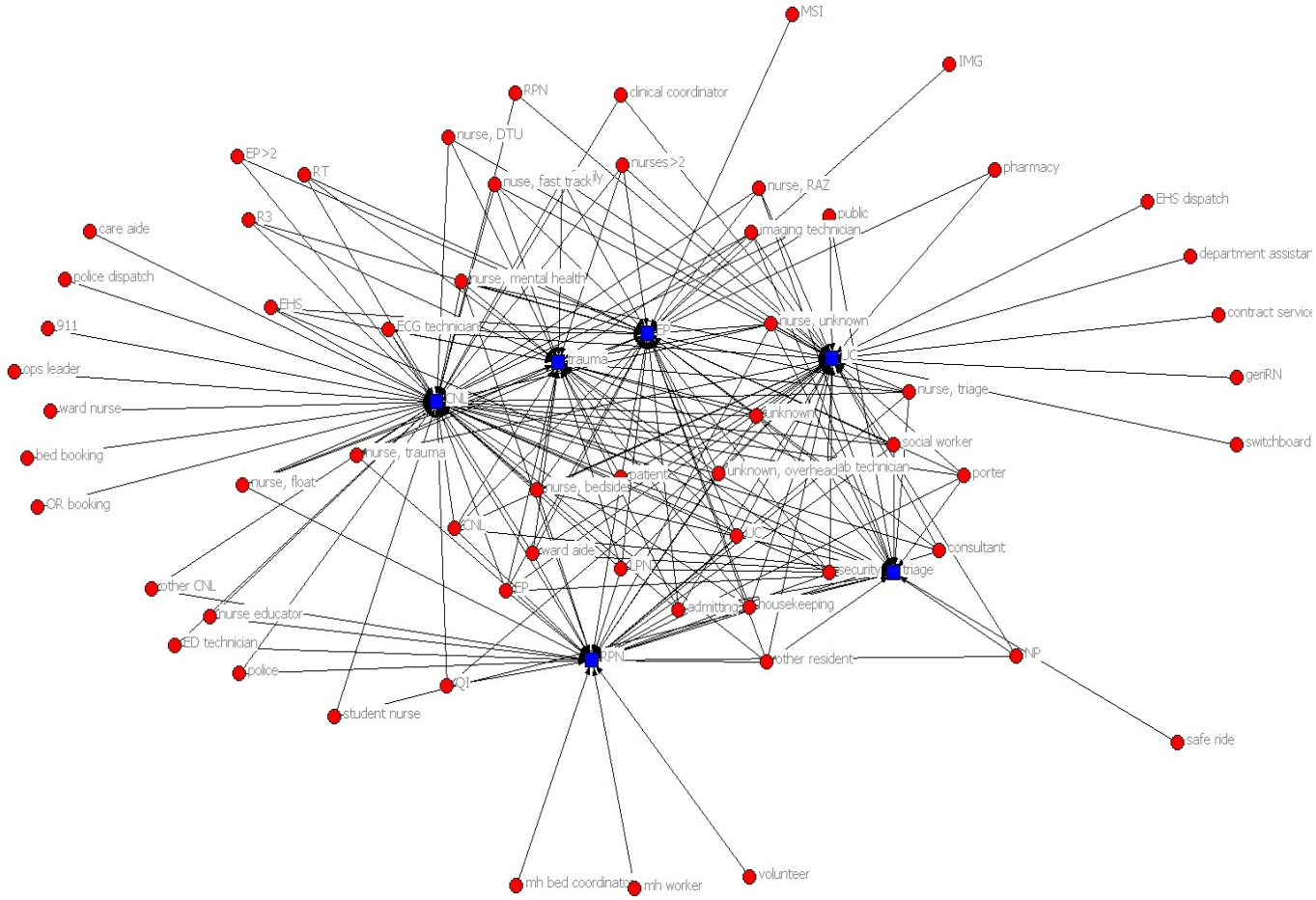

Figure 6.1: Observed interactions

interactions (58 percent), with clinical nurse leaders, triage and trauma nurses and physicians experiencing roughly equivalent proportions (range 42 to 49 percent).

The proportion of one-way interactions was higher if the event was an interruption (54 percent), with receiving information (58 percent) and receiving requests (49 percent) the most common. All participants experienced approximately equal proportions of one-way interruptions (range 52 to 57 percent).

Other Parties

The majority of events (40 percent) and communication time (30 percent) involved interaction with "unknown". The "unknown" category results from mediated-communication channels where other participants could not be determined. For example, the other parties cannot be completely determined when writing on the medical chart or entering orders into the computer, hence one of the parties was always coded as unknown. In addition, if there was a page overhead, then all of the parties who were able to hear the page were listed as "unknown".

The most commonly identifiable other party by events was clinical nurses (26 percent), not surprisingly since they are the most numerous staff in the department. However, patients and family, who only accounted for 10 percent of events, were the most common other party with respect to communication time (26 percent). Clinical nurses made up the next high-

est category by time (19 percent). Clinical nurse leaders (8 percent), physicians (7 percent) and learners (7 percent) were involved in approximately equal proportions of communication interactions by time, although physicians (10 percent) were involved in twice as many events as clinical nurse leaders (5 percent). Department staff, including unit coordinators, porters, ward aides, were involved in 5 percent of communication interactions by time, whereas social workers were involved in less than 1 percent of observed interactions. Outside agencies, primarily EHS (3 percent), and hospital technical staff (3 percent), such as laboratory, cardiology, and imaging technicians, made up the other groups that were observed in more than 1 percent of interactions by time. Contract agencies such as housekeeping and security, were observed in less than 1 percent of interactions by time, although they accounted for 4 percent of interactions by event (primarily overhead paging).

Clinical nurse leaders spend the greatest proportion of the their communication time interacting with clinical nurses (26 percent), followed by other nurse leaders (16 percent), patients and family (11 percent), department staff (10 percent), and physicians (10 percent). Interactions with outside agencies (4 percent) and hospital clerical staff (1 percent), such as bed booking, make up most of the remainder of observed communication.

Triage and trauma nurses spend the major portion of their communication time interacting with other clinical nurses (34 percent), patients (28 percent), physicians (11 percent), and outside agencies (6 percent). They

spend 2 percent of their time interacting with department staff, and 2 percent of their time interacting with hospital technicians. Interactions with clinical nurse leaders accounted for 1 percent of the observed communication interactions by time.

Unit coordinators on the other hand spend the largest portion of their communication time interaction with "unknown" (51 percent), again expected since they primarily use asynchronous communication channels. Clinical nurse leaders (19 percent) are the most common identifiable other party, followed by clinical nurses (9 percent), physicians (7 percent), hospital technical (5 percent), other department staff (4 percent), learners (4 percent) and patients and family (3 percent).

Physicians spend the majority of their communication time interacting with patients and family (45 percent) and "unknown" (32 percent), followed by learners (14 percent), clinical nurses (8 percent), and other physicians (6 percent). Interactions with clinical nurse leaders, hospital technical and outside agencies each account for approximately 2 percent of physicians' communication time.

Averaging the communication time proportions over one hour demonstrates the approximate distribution of interactions by time from the perspective of each group observed [see Table 6.6]. These data suggest that physicians, as well as trauma and triage nurses, are most likely to strategize to "gain" time by overlapping communication, and physicians in particular have little opportunity to adjust relative to their communication

load. This because their communication load is 89% of observed time, with procedures and movement around the department taking up most of the other 11%.

Clinical nurses and physicians primarily interact face-to-face. The proportion of face-to-face interaction between physicians and clinical nurses is 90 percent based on physician observation, whereas the proportion of face-to-face interaction between clinical nurses and physicians is 82 percent based on nurse observation. The use of mediated, asynchronous channels, such as paper-based or computer-mediated communication, accounts for 8 percent of observed physician-clinical nurse interactions (7 percent computer-mediated, 1 percent paper-based), and 3 percent of observed clinical nurse-physician interactions (all paper-based).

The primary purpose of physician-nurse interactions is patient care (59 percent), while unit management accounts for 32 percent of physician-nurse interactions and 17 percent of physician-nurse leader interactions. Nurse-physician communication events are also primarily about patient care (65 percent).

Conversely, nurse-nurse interactions are nearly equal between patient care (45 percent) and unit management (39 percent), while clinical nurse-nurse leader interactions (67 percent) and clinical nurse-department staff interactions (52 percent) are primarily about unit management.

However, these relationships vary when comparing communication times. As proportions of communication time, physician-nurse interac-

	Nurse–Leader	Nurse–Clinical	Staff	Physician
Total per hour	48m36s	47m24s	43m48s	52m48s
Patient/family/public	5m22s	13m19s	1m16s	23m58s
Nurse leader	7m45s	33s	8m28s	50s
Clinical nurse	13m45s	16m	4m	4m17s
Department staff	5m42s	1m7s	1m42s	52s
Hospital clerical	43s	3s	41s	0s
Hospital technical	27s	59s	2m	1m47s
Contract agencies	28s	23s	24s	4s
Outside agencies	1m55s	3m2s	8s	54s
Medical	3m30s	5m25s	3m6s	3m1s
Learners	43s	2m16s	1m38s	7m24s
Unknown	10m54s	12m44s	22m29s	16m47

Table 6.6: Proportion of interactions by time averaged over one hour

tions are still predominantly about patient care (6 percent) compared to unit management (2 percent), and the proportions are identical when looking in the reverse from nurses to physicians.

Nurse-nurse interactions by time are equally divided between unit management (15 percent) and patient care (14 percent), while nurse leader-nurse interactions are almost twice as common about unit management (18 percent) compared to patient care (11 percent).

Physician to physician events primarily involve patient care (33 percent), with events related to unit management occurring less frequently (25 percent). This relationship is the same when considering communication time. Physicians also spent 5 percent of their observed communication time in conversation with other physicians about education.

Physician-learner communication events are also primarily about patient care (52 percent), and less so about education per se (30 percent), although it was sometimes difficult to distinguish. This relationship remains when comparing communication time. Physicians are the only group that spend more than 1 percent of their communication time teaching.

Nurses engage in dialogue with each other about patient care and unit management. Physicians engage in dialogue primarily with patients and families, and with learners. Physicians and clinical nurses, as the two groups that provide bedside care, have on average approximately 5 minutes per hour in communication together for dialogic sensemaking, although only 72 percent or close to 3 minutes is two-way interaction. Tak-

ing 59 percent (the proportion related to patient care) of 3 minutes per hour out over an 7 hour physician intake shift, gives approximately 12 minutes, with the option of an additional 8 minutes, or up to 20 minutes a day to share sensemaking about patient care. Distributing that time over 18 patients (an average shift of 2.5 patients per hour), leaves 40 to 60 seconds per patient per shift, and probably less for dialogic sensemaking.

These data demonstrate that emergency care is largely a communicative activity, with multiple and complex interactions, interruptions, distractions, and time pressures. Time for dialogic and shared sensemaking is limited, and use of asynchronous communication channels is essential for distributed knowledge across persons, space and time. However, in the dynamic environment of an ED, asynchronous channels risk monologic communication. There is a need for balance, while maximizing opportunity for dialogic sensemaking.

The importance of dialogic sensemaking is illustrated by the following case of a critically ill patient that I observed during one communication observation period.

> An elderly patient was brought to the ED by ambulance having been found vomiting and collapsed in the washroom of a public building. The patient was initially placed in an acute bed, and it was noted that there were two patients with same last name. The department had 36 patients, with 5 in the waiting room, but the OCP had not been activated.

Almost 40 minutes later, the bedside nurse (Nurse A) comes to tell the Clinical Nurse Leader (CNL) [the participant] that the patient "not to be confused with the other patient with the same last name" is to be transferred to the trauma room "decreased [level of consciousness], very hypertensive, and starting to do the 'neuro'". However, the patient had recently received Gravol, and Nurse A wonders if "his [level of consciousness] is decreasing or if it's the Gravol?" Nurse A and the CNL go over vital signs and medication as they arrange to move another patient (recently cardioverted and bradycardic) out of the trauma room in order for this patient to be moved in.

It is also shift change for the emergency physicians (emergency physician A (EPA) is leaving, and emergency physician B (EPB) is arriving). Respiratory therapy is paged, and the clinical educator is available for support. EPB and the emergency resident are "running the show". Verbal orders are given to the trauma nurse (Nurse B) for some medication, and EPB states "I put this all in the computer".

As the patient is being prepared for intubation, nurse A approaches the CNL with her concern that this is "overkill". The CNL queries EPB and the emergency resident about the chemstrip (normal) and if narcan had been given (no). EPB states "we're going to go with thiopental, midazolam and [succinyl-

choline]".

EPA enters the room and nurse B asks "how much midazolam?" EPA responds "Fentanyl, thiopental, and sux". Four minutes later, while drawing up the other medication, nurse B looks at the order sheet and asks "I've got an order for midazolam, but was asked to pull up fentanyl".

The confusion was clarified, the patient medicated and intubated. There was no harm. The patient was eventually diagnosed with an intracranial hemorrhage and transferred to neurosurgery.

Over the course of observation, the care providers attempted to make sense of what was going on, but did not share their perspectives directly with each other. This lead to conflict and confusion, and threatened safety. Although no harm was suffered, the case nevertheless illustrates the need for dialogic interaction and shared sensemaking.

6.1.10 Summary

The communication observation data provide a window onto the complex patterns of interaction in an ED, and demonstrate the limited capacity for dialogic sensemaking. Safe care of patients in an ED relies on effective communication. The Emergency Decongestion Pilot time targets for ED patient throughput may enhance efficiency of patient care, but also reduce opportunity for reflection or review of the patient. ED patients must often

move through different areas of the department and hospital to undergo different stages of care. Thus, handover and shared sensemaking between providers is key to a consistent and coordinated approach to safe patient care.

Practitioners, therefore, must have a way to meaningfully collaborate and make sense of what is going on. Dialogism, in this context, offers an opportunity for practitioners with different logics and perspectives, to meet, engage, and "allow for something generative to happen out of their explorations" [22, p.22]. In this way, dialogic sensemaking provides a resource for resilience, by enabling a shared and distributed awareness of "the sense of the event" (*phronesis*) [411] and a collective response to the actual and potential [531].

6.2 Resilience

Resilience describes the resourcefulness generated from the affordances of the work context [444]. Resilience in anticipating and recovering from threats to operational performance and safety in the ED relies more on the professionalism, innovation, vigilance, reactions, and interactions of care providers, than it does on standards and procedures. Resilience relies on a team's distributed cognition [121, 133, 532, 533]. Active sharing and updating of sensemaking enables risks to be collectively and progressively monitored [254].

The system must cope with the demands of acuity and flow; capacity is

not only physical space, but also includes cognitive and system resources required for the nature of the demand. "Safe capacity" [62] speaks to resource matching. Depending on the acuity, staffing and resource mix, we may exceed "safe capacity" even though there may be empty stretchers in the department. Yet, the criteria for activating OCP are physical space criteria, and do not include the more inclusive concept of "safe capacity" [62].

The problem is there is no good way of monitoring system vital signs. No one person or position has real-time oversight, or a bird's eye view of the department. There is no "maitre'd". The physical layout does not allow for a person to stand in one place and see the entire care area. There is no panopticon. Rather, there are lots of "nooks and crannies" and physically separate care spaces. This contributes to fragmentation, and break down in communication. The ability of the department to respond to an incoming patient requires anticipation, but providers and staff are so caught up in keeping up, reacting, that our ability to anticipate and prepare is limited or nonexistent.

Not to say that we are not good at reacting; in many ways we excel at reacting and responding. People are able to pitch in and help out where needed, even though that may not be their primary job responsibility. But this varies depending on the day, the personnel, and the dynamic. We do not often display resilience [49, 448]. Why does "a bomb have to go off" to prompt this more flexible and resilient work pattern? Why does it more

often feel like the system serves more to frustrate than aid and assist? Patients tend to dwell in stretchers waiting. From the patient's perspective, there are long periods of waiting, interrupted by investigations and interventions.

Nursing ratios contribute to safety by not overloading any one individual, at least in theory. This is something that nurses appreciate, because it is not the same everywhere. Indeed, at the provincial trauma centre, if the department is responding to several trauma cases at the same time, a not infrequent occurrence, then nursing and physician staff tend to move to the trauma area, leaving other patients with perhaps one nurse. That is, the nursing ratio varies depending on the acuity and workload demand. Even maintaining a 4 to 1 ratio may feel very different depending on the acuity and complexity mix of those 4 patients. Managing and caring for 4 stable patients awaiting investigations feels very different that simultaneously managing, intervening, and treating 4 sick and/or unstable patients. Hence, a rigid 4 to 1 ratio is not a sophisticated and sensitive enough "rule" to permit and encourage the necessary flexible adaptation. Moreover, moving stable patients around, in order to care for unstable, more acute patients, or as yet undifferentiated patients, or the resistance to this, was part of the boil over frustration that lead to the introduction of the OCP.

At the centre is the ethical principle of distributive justice. We have a limited resource. How do we apportion this resource? How do we deter-

mine who receives care? Do patients suffer when our attention is directed to an unstable patient or patients, be they sick or violent? The example given of a triage[4] nurse who was in the position of deciding between an "in your face" acting out, aggressive individual, or the quieter patient complaining of chest pain, who was unknowingly having a myocardial infarction. Our ability to deal with the acutely intoxicated or mentally ill patient who is aggressive and violent without posing a risk to other patients is the horn of a dilemma. Attend quickly so as to gain control so other patients are not harmed, or attend to the more medically ill. Not having a care space or systematic response like a trauma team for violent patients leaves the department vulnerable, forcing people to "jury rig" solutions.

Such is the case of the patient with cocaine psychosis who ran out the back door and ending up jumping off a bridge [see below 6.2.1]. We had no space in the care area designed to manage patients like this; space was inaccessible because of a system-wide lack of mental health beds. We routinely have between 4 and 8 patients admitted to psychiatry in the department who cannot be moved because there are no inpatient beds. This system constraint leaves these patients in limbo in the ED, and leaves the staff frustrated. Our ability to care for other "incoming wounded" is impaired

[4]Triage is a well established principle and process whereby those for whom immediate care might make a positive difference in outcome are prioritized over those who are likely to live or die, regardless of the care they receive; however, this level of triage is rarely invoked in everyday ED operations. Instead, all are assigned to care based on severity of illness as if resources are sufficient.

because we now do not have a "safe space" [62].

6.2.1 Resonance

Even with individual vigilance, good intentions and effort, patient safety is threatened by functional resonance[5] of system interactions [144].

> Peter [6], a mid-aged male, not known to the ED, presented by ambulance having been found running in front of a bus and challenging police to a fight. He was reported to have used crack cocaine. He arrived in the ED shortly after midnight, and was noted to be "cooperative". He had not been arrested under Section 28 of the Mental Health Act, and was not restrained.
>
> Peter was seen by an emergency physician 5 minutes after arrival and was sedated with intramuscular midazolam. The physician noted that the patient had used "excessive cocaine" and had been found in traffic. There was no noted trauma or history of medical problems. Peter was not certified under the Mental Health Act, but the physician intended for the psychiatric nurse to see him when he woke up. Six hours after receiving the medication, the bedside nurse found him awake and steady. Apparently unaware that he was to be seen by the psychiatric nurse in the morning, he was discharged to followup with his own physician.

[5]The emergence of failures from normal performance variability
[6]Pseudonym

Three hours later Peter re-presented to the ED stating he was being chased. He seemed paranoid to the triage nurse, but noted to be "cooperative". There were no beds available in the ED, so he was triaged to the Fast Track area at 9:46AM. The LPN who performed his vital signs noted that he was tearful, tremulous, confused and expressing suicidal thoughts. His vital signs were normal apart from a fast heart rate at 120 beats per minute. The psychiatric nurse was paged, and the patient was seen in the ENT room. She found him delusional, fearful that police were trying to kill him, and that police were going to take him to prison to torture and kill him. He was noted to have pressured speech, was anxious, irritable and refusing oral medication. He then expressed his fear that hospital staff would kill him.

The emergency physician was promptly notified and Peter was seen briefly and certified. The psychiatric nurse went to security to get help to contain, restrain and sedate. However, security was responding to a violent person on one of the hospital floors (STAT "Code White" at 10:40AM). They arrived in the ED 10 minutes later, but could not find Peter. The room was empty and there was no sign of Peter in the department. The security log noted that the back door alarm had been triggered one minute prior to when they documented they had arrived

> in the department at 10:49AM. Seemingly Peter had gone out the back door without anyone noticing or hearing the alarm. A director's warrant was issued and the police were notified.
>
> Later that day the police notified the department that there had been a crash on a bridge, and the vehicle involved had been rented to Peter. The driver of the vehicle was witnessed to jump from the bridge when the police arrived. Apparently there was a suicide note. Peter is officially listed as a missing person since his body has never been recovered [534].

Reviewing this case reveals several necessary but individually insufficient factors that contributed to this example of system resonance and patient harm. First, the patient: Peter was alone, from out of town, and on a drug binge. Second, there was no secure care space available. There was an access block. All of the secure rooms had patients admitted to psychiatry. Third, security was attending to another violent patient at the same time in another building and floor in the hospital complex. Fourth, the door alarm was not recognized for what it was. I tested the alarm shortly after this event and no one came to ask what I was doing. This in part is because the alarm is activated only when the door is opened, not when the push bar is pressed. Indeed, the sign on the door states "keep pushing door will open in 15 seconds", and in part because the alarm speaker is high on a post in the middle of the workspace where the ambient noise level might overwhelm it. No one factor accounts for this safety event, but

the instantiation of inter-actions led to Peter's death. Peter fell through the cracks [534].

6.2.2 Adaptive Capacity

Adaptive capacity denotes the capacity to cope with uncertainty and requires a degree of "slack" [535] in order to be effective to meet novel and ambiguous circumstances. Adaptive capacity aims less at improving efficiency than improving the ability to learn, to act reflexively, and to maintain or transform social structures and processes [536]. Implementation of the Over Capacity Protocol in response to the stories of patient deaths in the ED waiting room in summer 2005 is an example, albeit a limited one.

Overcapacity Protocol

The Overcapacity Protocol (OCP) is a system strategy designed to enhance access to ED treatment and inpatient care by improving patient flow [523, 524]. The OCP is based on the principles that:

> Overcrowding needs to be addressed with the support of the entire hospital; that patients should be matched as soon as possible to the right [clinical] program and the appropriate skill of the care provider; and that there should be common expectations with respect to patient dignity, privacy and nursing care in all units across a hospital ... Inpatient units are required to accept up to two admitted patients to the most appropriate unit

> who meet defined criteria. The units work under a "no refusal" policy and aim to begin the transfer of patients within 10 minutes of when the ED is at overcapacity. No unit receives more than two overcapacity patients, within existing resources ...Since implementation, the OCP has shown to be successful in addressing bed flow and congestion issues of the ED. It has improved the safety and quality of care through consistent standards for all patients ...The average time from when a decision was made to admit to hospital to when the patient left the ED for a ward dropped from 13.2 hours [pre-OCP] to 9.3 hours [post-OCP] [537].

Although there has been a reduction in the average ED length of stay [Table 6.7], and the number of admitted patients held in the ED at midnight [Table 6.8] [537], implementation of the OCP has not been without controversy [538]. The "defined criteria" and "existing resources" are determined by nursing leadership — the Access Leader/Clinical Coordinator in "collaboration" with the Operations Leader and Clinical Nurse Leader — which can undermine the impact of OCP on the ED.

> And yet (provincial nurse leader) in the paper again yesterday, railing against this idea of an overcapacity or a, you know, putting patients up on the wards because, "Don't you understand that it's a recipe for disaster, it's incredibly dangerous.

It's incredibly dangerous to have patients in hallways where there's no suction and no oxygen." Where the hell do you think they are now? Except there's 30 of them instead of one. [Questerview, physician, lines 719-723]

Average ED LOS

Program	Pre-OCP	Post-OCP
Medicine	18.2 hours	13.5 hours
Surgery	9.3 hours	7.9 hours
Mental Health	55.4 hours	47.8 hours
Overall	20.2 hours	16.4 hours

Table 6.7: Average ED length of stay for admitted patients by program before and after implementation of the Over Capacity Protocol.

Now approaching 3 years after the introduction of OCP, I observed an interaction during one of the observation periods between the Clinical Nurse Leader (CNL) and Clinical Coordinator (CC) that demonstrates the complexity of the issue. The CNL and CC are reviewing patients to see which admitted patients can move out of the department, when the Triage Nurse "interrupts" with a silent "HELP".

Average number of admitted patients in the ED at midnight

Program	Pre-OCP	Post-OCP
Medicine	7.8 patients	5.9 patients
Surgery	1.8 patients	1.4 patients
Mental Health	7.2 patients	6.0 patients
Overall	18.9 patients	14.6 patients

Table 6.8: Average number of admitted patients held in the ED at midnight by program before and after implementation of the Over Capacity Protocol.

In this almost 12 minute routine conversation between the CNL and CC several issues are highlighted. It is a Monday evening and the hospital is "full" — there are no beds. The department is already in a "free fall" and brittle, yet OCP is called almost as an afterthought. The waiting room is full of patients, three of them sectioned by police or certified by an emergency physician under the Mental Health Act. There is a psychotic/manic patient acting out in Fast Track who requires a secure place for care, but none are available at the moment, a scenario eerily reminiscent of a similar situation several months prior [see Section 6.2.1].

Even when OCP is called, only one bed space is freed up, in part because of the particular requirements of patients (need for a ceiling lift or Medical Exception to Transfer), but more importantly, given the demand in the department on this night, no mental health care spaces are opened up. Psychiatry is essentially immune to OCP. The lack of space for men-

tal health patients is a chronic system shortfall. There are two critically ill patients, one recently intubated and awaiting ICU assessment, and the manic patient who will need to be managed in Fast Track. "Heavy workload" says the CC — an understatement. The silent "HELP" of the triage nurse is met with minimal organizational response, leaving her and the department to cope alone.

> It's an intimate environment where we work, where you have limited space and limited containment, and it doesn't take many patients that are acting out of normal societal expectations or normal societal standards to disrupt a great number of people. [Focus group, physician, lines 61-63]

Although no 'questerview' or focus group participants used the terms "resilience" or "brittleness", suggesting lack of explicit awareness about the concept of system resilience, many participants talked about feeling "saturated", or going beyond a "threshold" where the department, or their sense of it, began to degrade. "Saturation" was most commonly related to space, but also reflected a mismatch between demand and resources, with the primary limits being space, staffing, and supplies. The flexibility or resilience of the department varied depending on the politics of the waiting room.

> So if there's a lot of work to be done giving medications or IVs or the rest of it, it depends on who the nurses are and it de-

> pends if someone is there who is watching over the nurses to make certain that they don't go out and start IVs in the waiting area . . . nobody wades out into the hallway and starts things. If you have people who are very conscientious and keen and feel the weight of the volume on their backs, then, yeah, they'll work hard to do their vitals, check them in, organize beds, shift people around in rooms and get things organized. But other people will just sit and play Tetris, or you know, check vitals on admitted patients. I think from the point of view of very sick patients or very unstable patients or high-volume sick patients, yes, things will get done very quickly and get done well. I think that all the other stuff gets kind of thrown to the side. [Questerview, physician, lines 812-828]

Practitioners attempt to cope by staying vigilant, taking on the burden personally, and yet at the same time feeling sabotaged in their efforts by the limitations and dysfunction of the system.

> One of my great fears when I work, because we all have frustrations and fears and all the rest, is the feeling that I'm being sabotaged. So part of it is not the blame thing, part of it is the, I'm trying to provide good patient care. My ability to provide patient care is being sabotaged by all of these things that don't work. But also, my ability to provide good care is being sab-

> otaged, my propensity to make mistakes is being increased by all the stuff that doesn't work. But [in the end] it's going to be my mistake. [Questerview, physician, lines 1561-1567]

> A lot of the operations of this department and the safety of this department rests upon our shoulders and individual shoulders, it is a burden that I think we all feel. That because the systems aren't in place. We have to be on top of this stuff. [Questerview, physician, lines 497-500]

6.2.3 Resilience Analysis

A resilient system is able to recognize when everyday practice and operations are at the margin of performance and safety, and adjusts practice in order to step back from a "free fall" or safety event. Resilience Engineering posits that safety is the ability to *succeed* under varying conditions, and not simply the avoidance of unwanted outcomes. Hence, if a system is resilient, it is safe, for it cannot succeed and fail at the same time. To be resilient an organization must be able to anticipate, monitor, respond, and learn [539].

I do not pretend to have performed a detailed resilience analysis, but on the basis of my findings I suggest that an ED generally excels at responding within system constraints, yet does not always learn from meaningful experiences, and performs poorly at monitoring and anticipating. Hence, an ED can "create safety" by fostering resilience through focus on

learning the "right" lessons (factual), monitoring leading indicators (critical), and anticipating (potential) threats and opportunities [531, 539] discovered in dialogue in a community of practice that is sensitive to failure. The case of system resonance and the findings related to capacity, communication, and collaboration leads to my third 'safety' principle:

PRINCIPLE: 'SAFETY' IS RESILIENCE

Our greatest glory is not in never falling, but in rising every time we fall

Confucius

Chapter 7

Conclusion

The main contribution of this research is to provide an alternative account to the dominant "medical error" and bureaucratic "measure and manage" discourse. I advocate for a pragmatic practice-based account of patient harm within an ongoing reflective conversation about safety and performance, and for foresight and resilience in anticipating and responding to the complexities of everyday emergency care.

A hospital emergency department (ED) is a liminal care space that operates under significant time, staff, and resource constraints, that in interaction exposes patients to the risk of harm. In this context, 'safety' is an emergent phenomenon based on collective joint action that is enacted dialogically by multiple actors within a resilient system imbued with multiple social, cultural and political meanings.

In this final chapter, I briefly summarize the evidence for these 'safety'

principles and place them into the context of recent work on 'safety culture' and resilience. I then reflect on these aspects of safety and point to the need for a 'phronetic' practice of care. I conclude by noting the implications and limitations of this research, and make recommendations to facilitate growth of a 'safety culture' in an ED through dialogic storying and foresight. Finally, I suggest areas for additional research to further our understanding of how to 'create safety' in the everyday practice of emergency care.

7.1 Principle: 'Safety' is Enacted Dialogically

Emergency care providers take pride in problem solving and coping with complexity in spite of system limitations. By working together, emergency staff, nurses, and physicians "make things happen". Hence, team cohesion and communication are critical to manage risk and 'create safety'.

7.1.1 Collaboration

Two key aspects and challenges of collaborative care are transitions and team coordination. Transitions in care, or handoffs, are a significant understudied threat to patient safety [298–300], and were identified on the performance improvement grid as an area for focus [see Figure 4.2]. Every ED patient experiences multiple transitions between providers and staff over time and space. In addition, continuous 24/7/365 operation dictates that handoffs between care providers are a routine yet vulnerable part of

everyday practice in emergency care. Thus the need to make transitions robust for safety.

Transitions involve much more than monologic information transfer; they also include a transfer of control or responsibility [301], and present opportunities for sensemaking and resilience [302]. In addition, the distributed and uncertain nature of emergency care calls for flexibility in structuredness and degree of interaction at transition points [303]. Hence, standardized "one-size-fits-all" communication scripts such as SBAR are limited in ability to facilitate dialogic sensemaking.

Shared sensemaking is required to build the understanding needed to inform and direct actions to address the hazards that threaten patient safety [525]. Safety is threatened primarily by non-technical (cognitive and social) skills, and therefore communication is key to developing shared dynamic mental models. However, in medicine, technical expertise tends to be valued over non-technical expertise as a basis of professionalism, which works against the potential of good communication in teams as shared practice and distributed knowing [540]. Environmental and task factors such as flow, overcrowding, noise, distractions, and interruptions, impede shared sensemaking and increase cognitive load, frustration, and fatigue.

Physicians and nurses, by virtue of their different professional roles, often have differing perceptions and goals for patient care. However, in the dynamic and interrupted environment of an ED, there is limited time

to talk, share perspectives and collaborate in sensemaking.

Working together to care for a population of patients [541] is the "rhyme and reason" of an ED. Taking the phrase "we make it happen" to encapsulate part of the 'safety culture' of an ED suggests that failure to relate with one another and enact safe care together puts patients at risk of harm.

Since safety emerges in action, it is something we *do*, not something we *are* or *have*. It is dynamic. An ED is one of the most interactive and interdependent care areas in a hospital. It is a liminal and porous interface — the cell membrane — between community and acute care. Hence, the delivery of emergency care is relational or dialogic, and 'safety culture', however defined, is most certainly dialogic; it is the interstitium of our interactions, emerging in the dialectic of system and practice [316]. Thus, safety emerges in dialogic interaction. It happens between.

7.1.2 Storying

I have demonstrated the importance of stories in constructing safety, by showing how individuals and groups "make sense" of and interpret their experiences through storying [22, 23, 25, 74, 107, 542]. Stories about patient safety incidents are developed within the interactions of clinical practice, and reflect a dynamic mix of emotion and shared notions of responsibility [25]. Importantly, stories are woven together through social interaction, thereby reflecting inter-subjective and wider cultural beliefs. Thus, stories help to establish and reinforce collective sensemaking, especially in situa-

tions of uncertainty [29]. The narrative perspective is also attentive to the links between knowledge and power, in recognizing that storytelling provides a basis for defining social reality, and the privileging of particular forms of social action [328].

Organizational safety narratives are constructed in three stages [25]. Initially, clinicians interpret risk embedded in context, and give accounts that are inter-subjective in character, and often emotionally rich. Such localized meanings of risk reflect wider assumptions about responsibility, culpability, and blame. Second, storied accounts are re-constructed as written reports, where "narrow narratives" are constructed, with an emphasis on pre-defined taxonomies. Finally, "narrow narratives" are further re-constructed through routine risk management perspectives, where accounts are re-coded and translated. Hence, the experiential, qualitative and culturally rich stories of clinicians are largely transformed into the abstract, quantitative, explicit, and often legal variables of management.

While this process may benefit risk management, it destroys context, and devalues the affective and interpersonal knowledge of clinicians and staff to the extent that they only report those safety events that "fit" the prescribed model (e.g. falls and medication errors), or disengage out of a sense of futility. As such, clinicians and staff are discouraged from reporting more complex or ambiguous events, despite important safety implications. Thus, the mismatch between complex stories and the simplifying constraints of a reporting system impedes rather than enhances learning.

Alternately, situated models of learning within "communities of practice" are more effective at both sharing knowledge and stimulating learning as they more accurately facilitate the translation of experience into change and improvement [386]. Support for this view lies in the impact of stories of patient harm in the ED that led to the organizational and regional implementation of the Over Capacity Protocol.

The communication observation data points to a significant communication burden in the department. Although the proportion of interruptions is similar to previously published data [63, 64, 68, 543], the rate of communication events and interruptions is one-and-a-half to six times higher than published estimates [63, 64, 66, 68, 70] [see Table 2.2]. Potential explanations for this finding are the increasing complexity of clinical work, the increasing impact of computer-mediated communication, and my "insider" position as the observer. The proportion of computer-mediated communication for nurse leaders and clinical nurses is similar to published data [68], whereas it is at least threefold higher for physicians.

Off topic interruptions and distractions are commonplace, and present a challenge to dialogic sensemaking. Physicians, as well as trauma and triage nurses, in particular, strategize to "gain" time by overlapping communication, though physicians have little opportunity to flex relative to their communication load. This is because physicians spend almost 90 percent of their time in communication activities, with procedures and movement around the department making up most of the remaining 10 percent.

ED practitioners normalize distractions and take pride in their ability to cope with the task of managing multiple concurrent demands ("multitasking"), though not often recognizing the cognitive penalties they incur with each task switch [544]. Time for dialogic and shared sensemaking between providers is severely limited. Thus, use of communication channels other than face-to-face becomes essential for distributed knowing across persons, space, and time. However, in the acutely dynamic environment of an ED, asynchronous channels risk monologic communication and "dropping the baton" [298].

Duplication of the same information through multiple channels, while a form of system redundancy, also contributes to inefficiencies and overall communication load. Fragmentation of the physical space presents considerable challenges, and locating mobile workers is both inefficient and a source of frustration. It can also be a safety threat if timeliness is an issue. This contributes to casual use of overhead paging, adding both to distraction and ambient noise.

As this dissertation attests, it takes a lot of information to describe what is happening in an ED, in part because an ED is an paradigmatic example of a complex system. The ED is unique because it is a porous and liminal space. It is not a mini hospital. The priorities and processes differ from other areas of the hospital, and events happen on a different scale. ED care providers and staff must self-organize to deliver care, making tradeoffs between competing priorities as they adapt to accommodate clinical

demand and balance concurrent care to multiple patients.

7.2 Principle: 'Safety' is Resilience

Emergency care has become increasingly complex over the past decade, with more clinical intervention, diagnostic testing, and observation care in the ED, with the latter often in place of hospital admission. More patients are presenting to EDs, and EDs are crowded and over capacity [45].

7.2.1 Capacity

Space is a key element for creating safety in the ED [265]. The OCP, as currently implemented *after* the department goes over capacity with admitted patients, is a reactive organizational policy based on physical space criteria. Thus, it is implemented when the department is already in a brittle and degraded state. The OCP does not account for case complexity and has limited, if any impact on the movement of patients admitted to psychiatry. Moreover, it does not facilitate the system response that is required to create "safe space" [62]. Hence, the impact of the OCP on ED operations can be minimal, as with the case presented where because of additional requirements, such as a medical exceptions to transfer, and the need for a ceiling lift, only one admitted patient was moved out of the department [see Section 6.2.2], effectively leaving the ED to cope alone.

Furthermore, other organizational policies can create conflicts with the OCP, like medical exceptions to transfer, and "sitters" for patients who

are certified under the Mental Health Act and admitted to medicine or surgery. In either of these situations, the ED is bizarrely the only location in the hospital deemed to be appropriate for the care of patients with additional needs. This is non-sensical. Any other HCO of this size creates a place to care for patients who do not require an intensive care unit, but do require close observation. Moreover, to have sick patients query "what will you do with me?" is shameful and morally distressing. We fail to live up to our mission as a hospital. Thus, alternative strategies are needed.

The department is predictably brittle by late afternoon and extending into the evening — a pattern that is particularly evident on Mondays. A resilient strategy would be to anticipate and implement the OCP prior to a "free fall" state.

Fundamentally, at issue are inadequate policies that appear to fix a problem but do not. Instead, practitioners and staff are placed in the position of having to extend themselves to make up for underspecified and inadequate policies. Capacity challenges are simply evidence of "solutions" that in fact create brittleness rather than resilience.

There are many times when the department is stretched beyond its capacity to adapt, yet needing to function at a high level of collective expertise. It is these moments, when it feels like a "zoo", that the ED is in a "free fall" and brittle state. At times like these, "whatever it takes" speaks to the adaptation and flexibility of accommodating demand and reflects first order problem solving [527]. Yet, it is also a time when the ED drifts to the

edge of safe practice.

Resilience in anticipating and recovering from threats to operational performance and safety in the ED is dependent upon the improvisation (bricolage) and sensemaking of care providers in dialogic action. Resilience relies on a team's "distributed cognition" [121, 133, 532, 533]. Active sharing and updating of sensemaking, enables risks to be collectively and progressively monitored [254]. Material anchors ("cognitive scaffolds") such as the chart, PCIS, and whiteboard, offer support for distributed and collective sensemaking, but are commonly trumped by the preference for face-to-face communication in the moment.

However, often "a bomb has to go off" for people to step out of their roles and be flexible. The 'system' must cope with the demands of acuity and flow; capacity is not only physical space, but also includes the resources required for the nature of the demand. "Safe capacity" [62] speaks to resource matching. Depending on the acuity, complexity, staffing and resource mix, we may exceed "safe capacity" even though there may be empty stretchers in the department.

Given these challenges and adaptations, the problem remains that the ED has no good way of monitoring system "vital signs". No one person or position has real-time oversight, or a birds eye view of the department. Rather, there are lots of "nooks and crannies" and physically separate care spaces, which contribute to fragmentation, and communication break down. Capable system response to incoming patients requires

anticipation, but the ED is typically so busy reacting, that the ability to anticipate and prepare is limited.

> A management approach based on resilience, on the other hand, would emphasize the need to keep options open, the need to view events in a regional rather than local context, and the need to emphasize heterogeneity. Flowing from this would be not the presumption of sufficient knowledge, but the recognition of our ignorance; not the assumption that future events are expected, but that they will be unexpected. The resilience framework can accommodate this shift of perspective, for it does not require a precise capacity to predict the future, but only a qualitative capacity to devise systems that can absorb and accommodate future events in whatever unexpected form they may take [545, p. 21].

Resilience is a system feature that allows it to respond to sudden, unanticipated demands for performance, and then quickly return to normal operating conditions with minimal drop in performance [546], as well as cope with long-term, recurrent issues. Resilience is a feature of a well functioning ED. Yet, an ED attempting to cope with limited space and resources has limits to its ability to be resilient [448]. At such times, innovation, flexibility, and "stepping up" contribute to adaptive capacity. So why does "a bomb have to go off" to prompt this more flexible and re-

silient work pattern? [546] Why does it more often feel like 'the system' serves to frustrate than to aid and assist?

ED practitioners function in a work environment that leaves little time for team reflection as a collaborative action. Team coordination contributes to safety and is a teachable skill amenable through practice simulation [257], as has been amply demonstrated in other safety critical industries such as aviation and nuclear power. Simulation can be used to create a safe space for recognition and innovation to develop and practice strategies and tactics for coping with the unknown, thus contributing to safety. However, in the ED, and in healthcare at large, there are few, if any, departmental education activities where physicians, nurses, and staff practice together, apart from normal work. There is no opportunity to step out of usual patterns and play with novel strategies. Thus, routine low-fidelity case-based simulation, that emphasizes communication, interaction and play, is critical.

Rules and checklists are helpful for routine action, but in their rigidity, rules are not sophisticated and sensitive enough to permit and encourage the necessary flexible adaptation under conditions of uncertainty. The key is knowing when to use them, and when not to. Misapplication of rules can be a threat to safety. Adaptive capacity requires a degree of "slack" [535] and flexibility in order to be effective in coping with ambiguous, complex, and novel circumstances.

7.2.2 Reporting and Learning

Futility, more than fear, was the primary barrier to reporting, suggesting that the departmental and organizational response for learning is the limiting factor. This finding speaks to the need for timely feedback and systems level analysis, which in turn, will require training and resources.

One of the challenges for safety learning communication in the ED is that the current system is not "quick and easy", nor, having seen the PSLS, do I anticipate that it will improve upon this. Stories of individual encounters with risk, when fed back into a practice community, are powerful vehicles for the type of vicarious learning that contributes to the robust learning cultures found in high-reliability organizations [19, 508]. Emergency care providers have stories to tell, but they often do not have time to tell them.

"Quick and easy" system notification of a patient safety incident (PSI) is essential to initiate system learning, but there also needs to be an opportunity to "afford a good story" in an unhurried way [21, 23]. The flaw in both systems, traditional incident reporting and the PSLS, is the constraint imposed on storytelling. Rich narratives keep the event situated, something that check-boxes and drop down menus cannot do. Worse, predefined categories draw the reporter to the sensemaking framework of the form and its creators, which limits system understanding and learning. The benefit of a paper channel is that it can be filled in as time permits, something the web-based application used by the PSLS currently

cannot accommodate. Furthermore, incident reporting suffers from a historical punitive connotation and is not necessarily related to patient safety as much as organizational discipline and control. Hence, I suggest we abandon incident reporting and move towards a process of safety learning through conversation.

The other major flaw in both traditional incident reporting and the PSLS is the trajectory of the story. In the current situation, and the one that the PSLS adopts, the report goes to a "handler" who in many cases is the operations leader of the department or their designate. This process is problematic. A critical piece of the Aviation Safety Reporting System's success is its impartial and independent position apart from regulatory and enforcement agencies [547]. Having the leader, who is also responsible for hiring, firing, suspending, promoting, reprimanding, and so on, respond to the story, places the storyteller in a hierarchical (power) relationship. This dynamic, even if overtly "non-punitive", impairs learning, and particularly if leadership itself is at issue. Moreover, given the distance between the operations leader and clinical work the response has typically been a reminder of policies and procedures and offering or demanding retraining for the storyteller. Time constraints and competing demands on the operations leader leads to pressure to "solve" the problem, or worse, no response at all. Feedback is incomplete and most reports are managed "off the side of the desk" [510].

In contrast, in organizations where there has been a shift to confiden-

tial reporting structures where storytellers bypass the manager and report events to other operators (peer safety staff), who then in turn work with the storyteller to make sense of *in situ* performance, that is to co-create "second stories", there has been greater leverage for organizational learning and opportunity to design simulations for practice in adapting to weak signals of safety threats [508]. Moreover, in this example[1], employees were empowered to contribute meaningfully to organizational safety, and helped enhance safety by changing work conditions. This is the model I suggest we adopt. I advocate for a multidisciplinary peer approach to foster "requisite variety" [357] in interpretation.

A "safety action team" (SAT) [548] could organize and give voice to ED (and other care units) efforts to advance patient safety, and support frontline staff in tackling issues relevant to their work. Providing a consistent and transparent approach to responding to PSIs will help foster a "just" learning culture [511, 513, 514]. Emphasizing the response to PSIs will build trust, promote a climate of openness, and facilitate storying and help to structure relevant and meaningful learning opportunities. Using a structured and systematic process of reflection and analysis, invoking clinical and practical expertise, and focusing on *in situ* practitioner-environment interactions, will improve both our understanding of the dynamic nature of threats to safety, and lead to more resilient and proactive

[1]Large safety-critical organization that moved from a management-driven incident response to a confidential reporting system run by safety staff

strategies to mitigate risk.

Furthermore, the SAT would give clinicians and staff the opportunity to help create solutions, allowing them to adjust the system they work in and to take ownership of changes. PSIs are learning opportunities, and collaboration among disciplines is a more productive response to the interdependencies among technical and human aspects of complex systems. PSIs are an occasion to identify and discuss issues, to encourage new insights, and to explore possibilities for change. By modelling the foundations of a patient 'safety culture' — trust, accountability, learning, partnership — the SAT will help create new networks of relating, and enable the emergence of "heedful interrelating" [140].

Retrospective (factual) [531] system safety learning has five phases:

1. *Identification* Recognition of a PSI presents the opportunity to learn, but in itself does not trigger system learning. Constant wariness and sensitivity to failure are features of high reliability organizations. It is through this valuing of safety that failures are anticipated and identified.

2. *Notification* In order for the system to learn, however, the PSI must be shared. This is the phase of notification, be it verbal or written, and ideally occurs close in time to the PSI. It is the system trigger, the light switch if you will. This must be the "quick and easy" part. Perhaps the simplest option is phone/answering machine notification, but

paper (fax), or email or text message, or web-based (PSLS) channels are also options. Most large-scale industrial reporting systems, such as the Aviation Safety Reporting System, provide multiple channels for notification and reporting in order to provide sufficient flexibility. Integration with the PCIS is perhaps most practical since patient, time, and place information is already captured. Furthermore, the PCIS is the main material anchor in the department. It is an interface that almost everyone uses and incorporates into their everyday work. Incorporating an additional safety learning tab into the user interface, much like the variance tab for followup of lab and imaging results, strikes me as the most streamlined approach. A brief notification of the patient, place, and time is all that is necessary at the point of occurrence. Ideally, confidential contact information is also provided for follow-up, but this is not essential. What is essential is that the occurrence of a PSI is identified with sufficient detail that the particulars of person (patient), place and time are known.

3. *Storying* Storying is the sensemaking part of giving an account of what happened. It should occur soon after the PSI, but does not need to be completed in detail in the moment. Indeed, time for reflection may afford a richer narrative, and therefore an opportunity for a more complex understanding. While storying may take place in concert with notification, it is important that the system not demand this, but rather give opportunity and time to capture the emotive

and contextual elements of the story. Eliminating this requirement lessens the burden of the moment, while allowing the storyteller to tell their story in their own time and their own words honours their agency. If the PSLS is to be used for this purpose, then the user interface must allow for a straightforward telling of "what happened" without prompting the storyteller to categorize the event. Capturing the story from the storyteller's sensemaking frame is vital. Inviting categorization at this stage contaminates the initial sensemaking process, and risks over-simplification. Categorization properly belongs after in-depth analysis.

4. *Sharing* Sharing and co-creating story in a community of practice facilitates system learning. All stories are perspectival, and are told from an embodied and situated viewpoint. Hence, multiple tellings from different perspectives affords the greatest opportunity for co-creating a complex and nuanced picture of what happened. However, "first stories" are but the starting point. It is the "second stories" that emerge from close, methodical, and intelligent consideration and analysis, that reveal the multiple subtle vulnerabilities and constraints of the larger system which contribute to failures, detect the adaptations human practitioners develop to try to cope with or guard against these vulnerabilities, and capture the ways in which success and failure are closely related [1, p. viii]. "Second stories" can reveal stochastic and systematic features, and provide the fac-

tual material for resilience analysis. Another benefit of sharing with peers is support for the healthcare providers involved.

5. *Distributing* Local system learning is vital, but not sufficient for large-scale system learning. For this, the lessons learned must be distributed widely. Collaborative networks such as the PSLS and the Evidence to Excellence initiative provide an infrastructure for distribution across the province. Here is where I see the main potential value of the PSLS if linked to deep analysis and feedback. At this big picture level, patterns of failure genotypes can emerge that cannot be detected in individual cases.

Storying within a social network fosters resilience [549]. Safety learning emerges through relationships (trust, conversation, story, collaboration), and less so through bureaucratic structures like reporting systems. Although there may be potential problems with transparency, encapsulation and power to act [549], these risks do not overcome the benefits of what people normally do — go to someone they trust (peer), tell them a story, and problem solve together. Reporting systems simply are not "natural". That is not to argue against their use altogether, but to recognize their limitations and strengths.

We have moved in the direction of creating a multidisciplinary space by including a Patient Care component at Morbidity & Mortality Rounds. We have made an effort to be more inclusive, and shift the traditionally

physician-centric rounds into an open departmental venue. This has been received with mixed feelings and executed with variable success.

Going forward, all mortality cases (in-hospital deaths within 48h of ED visit), submitted morbidity cases, and "good catches" should be reviewed by members of the care team. Patterns in incident reports also should be reviewed. Cases should be selected for their educational value and presented as in-depth stories-in-context. No clinicians should be identified unless they choose to self identify. The emphasis should be on learning from failure and success with others, while exploring work ecology from a systems perspective with accountability for acting on recommendations.

I suggest that the review, analysis, and selection of cases be part of the work of the SAT. Further, I suggest a rotating roster of providers and staff be invited to participate and present at monthly rounds. If we are to be serious about creating an open interdisciplinary space for departmental communication about patient safety, then we must acknowledge our interdependence, and embrace a collaborative spirit.

Concerns have been expressed, however, that the atmosphere of Patient Care Rounds is too public and formal to feel safe to express feelings about patient care challenges. Hence, an alternate less formal venue is also suggested. Safety Huddles have worked on other wards, but we have struggled to sustain safety huddles in the ED. These are are intended to be brief coming together team activities to solve a local perceptions of events going out of control (weak signals) or repeated problems as yet un-

resolved; their function is localized and immediate sense making. However, they have been inconsistent and poorly attended. As an alternate, I suggest that the SAT meet on a weekly basis, and that the meeting is open for drop-in.

Storying and learning from PSIs are necessary but insufficient for a robust safety strategy. Many PSIs are not identified or reported by those involved. Hence, an ongoing surveillance strategy is recommended, and trigger tools or administrative discharge data are a good place to start. The trigger tool strategy involves a focused review of a random sample of patient records, for example, 10 random ED charts every 2 weeks, triggered by ED readmission within 48 hours, and ED length of stay greater than 6 hours. Additional "triggers" could include use medication use, such as reversal agents and procedural sedation, critical lab values, and cancelled orders. All of these "triggers" could be initially screened electronically, perhaps automatically. While "triggers" suggest the possibility of a PSI, a retrospective chart review, with its methodological limitations, is still required [550]. Again, I suggest that these activities fall under the work of the SAT.

Feedback is essential for calibration and improved performance, and would greatly benefit from a more robust strategy than "remember that patient". We have already instituted a PCIS variance report for discordant imaging and critical laboratory results (positive blood cultures, for example), but we, like most emergency physicians (and nurses) lack systematic

outcome feedback [202, 293, 294, 551].

7.3 Principle: 'Safety' is Political

I found that 'safety' is a polysemous[2] term used with power, having different situated meanings and interpreted from multiple perspectives within the social organization of the health care system. That is, 'safety' has a political and instrumental dimension within a bureaucratic organization. In the data presented, I did not unveil a mythic unified 'safety culture', but rather came upon a collage of multiple 'safety cultures' fragmented by group and professional identities. Although there was similarity in perspectives and patterns of interaction, there were also significant differences between clinicians and non-clinical staff, between nurses and physicians, and between leaders and those without leadership positions.

In short, non-clinical ED staff report that they feel less pressed for time, have adequate resources, do not feel significantly impacted by the loss of experienced personnel, and find reporting of patient safety events relatively easy. Clinicians, on the other hand, feel pressed for time in a staff and resource limited department, and do not find the process of incident reporting either quick and easy or fruitful.

Emergency nurses are less fearful of repercussions, but also less likely to perceive that individuals involved in an event contribute to learning. On the other hand, physicians strongly believe that individuals involved

[2]Multiple meanings

in an event contribute to learning from what happened, but are also more ambivalent about potential repercussions. Physicians generally see themselves as ultimately responsible for patient care. Hence, it may be that nurses are more influenced by a sense of futility than fear, whereas physicians are more conflicted about the personal stigma that may be associated with mistakes.

That clinicians and non-clinicians do not perceive safety threats the same is not surprising, given differences in training, role, and accountability. The difference in perception between nurses and physicians on the value of learning, however, is surprising, given that physicians rarely, if ever, fill out incident reports, whereas nurses typically do. It is physicians who strongly endorse learning from events, even if they are more ambivalent about repercussions. Finally, that clinical leadership across professions differs in perception of the balance between patient safety and productivity suggests a tension between work-as-planned and work-as-done.

7.3.1 Differentiation

Three different 'safety' narratives — "competence", "capability", and "sanctuary" — emerged from group discussion about 'safety' in the department. The "competence" narrative tended to be a narrative of the individual, and strategies to enhance professionalism. Moreover, practice standards, education, and training, were proffered for "creating safety". The "capability" and "sanctuary" narratives, on the other hand, were narratives

of the department, and focused on performance and security of the collective. Practitioners felt "unsafe" when their performance was stymied by system factors, all essentially beyond their immediate control, and in particular the lack of space when short staffed. Hence, the boundaries between 'safety', "suboptimal" performance, and "sanctuary" were blurred.

Perhaps the most salient example of the political nature of 'safety', however, was the difference in collective response between emergency physicians and nurses to patients being cared for in the ED waiting room due to hospital access block. For nurses, there was a perceived risk of harm from an act of commission — administering a medication without adequate monitoring ("competence" narrative), while physicians perceived a risk of harm from an act of omission — not attending to a potentially unstable patient in a timely way ("capability" narrative). Neither was right, nor wrong. Both were attempting to mitigate risk. Each view came from the metrics of their respective practice frameworks: nursing practice standards and time-to-physician, respectively. Yet, out of this tension came innovations in ED care such as the Over Capacity Protocol, the Rapid Assessment Zone, and the Diagnostic Treatment Unit, as we moved from a fractious "either-or" to a more collaborative "both-and" frame.

Hence, the contested aspect of 'safety' is both a threat and a resource, and the danger lies in safety concerns being dismissed or minimized. Incident reports are often used to "tattletale" and complain about work-life or personnel, and 'safety' is used to leverage resources from leadership,

who must discern the signal of patient safety threats through the interference (noise) of complaints. Leadership support for 'safety' is threatened if leaders perceive that they are being played.

Risk perception is a system strength. No one person can know what is going on in the department at any one time. Coping with complexity requires "requisite variety", and constant and collective wariness. Threats and hazards can be "gems" that reveal systemic vulnerabilities. Systematic reward for giving voice to safety concerns will help foster an open dialogue, replace the undercurrent of blame, and give evidence to the value of safety.

7.3.2 Values

There is a perceived lack of support from senior leadership among emergency staff and care providers, a belief that the balance between productivity and safety is skewed, and a limited sense that safety is promoted in our workplace.

Safety is one of six quality goals for HCOs [434]. Tradeoff between the family of acute goals — timely, efficient, effective — and the family of chronic goals — safe, patient-centred, equitable — is at the heart of the dynamic balancing act of creating safety [552]. Lessons learned from the inherent tensions and trade-offs in NASA's "Faster, Better, Cheaper" goals that contributed to the Columbia accident point to the "mirage" of "best practices" as a safety strategy [552, p. 27].

To advance all six quality goals, the family of chronic goals must be prioritized in order to guard against the tendency to value the more immediate, "measurable", and direct consequences of the acute family of goals. Valuing the chronic goals in healthcare puts the patient first, along with safety and equitable access.

However, EDs are driven and measured by time — time to physician, time to treatment, and length of stay. Day to day ED practice is marked by the inherent time-based production pressure of the Emergency Decongestion Project[3]. Although intended to honour the chronic goal of equitable access, it is actualized primarily as an acute goal of efficiency, placing practitioners in a double-bind that invites an efficiency-thoroughness tradeoff [59]. Efficiency is only a means to an end, and a way to achieve other values [553], and may have to be sacrificed for resilience and safety. Thus, how voices of concern are valued when everything turns out alright is a testament to the maturity and resilience of our work. Do we regard them as a nuisance, or as courageous?

7.3.3 Power

Power is a central concept in understanding organizational accidents [206] and 'safety culture' [25, 316, 347], and invites a critical reappraisal of top-down, functionalist approaches to 'safety culture', which equate safety with compliance, training, and discipline. The bureaucratic "measure-

[3]A regional pay-for-performance process improvement pilot directed at increasing department throughput

and-manage" paradigm can be viewed as an example of "prison-like" surveillance and control [328], and an effort to establish or maintain managerial authority over clinical work [23, 25, 554].

In contrast, post-bureaucratic "bottom-up" techniques that engage clinicians in cooperatively and collaboratively (re)designing, organizing and managing their work do not impose managerial structure from above, but *elicit structuration from below* [italics in orginal, 23]. Engaging clinicians in teleo-affective[4] and dialogical narratives, with team members dynamically balancing critical judgments, emotional reactions and reflexive considerations [557], creates a space for "operationalizing concerns, emotions and judgments among those who in the old paradigm were to be managed "top-down" ...and privileges discourses that give greater prominence to what matters to those who do the work [23, p. 142].

Therefore, the quest for 'safety culture' includes the search for multiple viewpoints. A culture which influences safety positively is thus not necessarily one which is homogenous or free from conflict, but one in which there is enough space to deal with conflicting views in a constructive and democratic manner [347, 558]. Therein lies the need for dialogic interaction.

[4]The collective property of a practice that is expressed in the open-ended set of doings and sayings [555], "where people sense and dynamically negotiate their own and others goals, actions, expectations, needs and feelings" [556, p. 1112]

7.4 Principle: 'Safety' is a 'Phronetic' Practice of Care

Finally, refracting the enacted, dialogic, resilient, and political aspects of 'safety' points to a 'phronetic' practice of care. *Phronesis* comes from Aristotle's *Nicomachean Ethics* [40] and has no equivalent English translation, unlike *episteme* (epistemology, epistemic – scientific knowledge) and *techne* (technical, technology – art/craft – oriented toward production) [36]. However, since *phronesis* is concerned with how to act in particular situations, it is variously translated as practical wisdom, practical intelligence, prudence [559], or 'practical reasonableness' [560].

Phronesis is the intellectual virtue of practical thought that balances instrumental-rationality with value-rationality (reasonableness). It calls for a sensitivity to context, a capacity to know when and how we ought to act. *Phronesis* requires an ability to grasp and recognize the significance or value of the experience for those involved in a particular situation. It entails making adjustments in line with a clear and informed grasp of the various competing interests at stake within a given, often dynamic context, as well as understanding how those demands and interests change, and then acting in a measured response. The concept of *phronesis* is at the heart of Gadamer's dialogical hermeneutics of openness to "the other" as a philosophy of medicine [37].

Phronesis is missing as a central feature from many conceptions of "professionalism" [561]. It embodies professional judgment and goes beyond

the knowledge (*episteme*), and skill (*techne*) required for practice. It "is the quality that the good professional needs when the algorithm runs out, or when there is a conflict between the guidelines and the reality of the situation, or conflicts of interest between different patients or team members." [561, p. 357]. Hence, *phronesis* is more than knowledge, skills, and attitudes. *Phronesis*, like expertise, is contextual, practice-based knowing that is both value laden and action-oriented [36, 42]. It is the insight and judgement based on the mastery of knowledge (*episteme*) and technique (*techne*) and the practical experience of coping with complexity, conflicts, and uncertainty. *Phronesis* is therefore central to resilience.

Variants, or closely related concepts to *phronesis* include "reflection-in-action" [562, 563], "personal knowledge" [399], "mindful practice" [443], "capability" [564], "reflective judgement" [565], "professional judgement" [566], and "know-how" [567]. Weick and Roberts [140] suggest that the practice of "heedful interrelating" involves paying close attention to fitting ones utterances with the utterances of "the Other" and to the demands of the jointly created situation. Heedful performance is distinct from habitual performance, and suggests that practitioners adapt their responses according to the uniqueness of an emerging situation.

Similar to jazz improvisation, or bricolage, skillful communication and sensemaking can be assessed by determining the degree to which conversational moves simultaneously follow what has transpired previously and enable others to follow and facilitate forward movement in the meaning-

making process. This suggests that how individuals create and sustain coherence within conversation is a key element to sensemaking virtuosity [29, 568].

> The real power and innovation of jazz is that a group of people can come together and create art — improvised art — and can negotiate their agendas with each other. And that negotiation is the art. ∼Wynton Marsalis

Resilient systems can deal with the unexpected problems that complex systems can create. These systems tend to promote and reward vigilance, flexibility, and openness. These "mindful" systems, though, depend on wise judgement of the individuals that comprise it, and the same qualities of vigilance, resilience, flexibility, and openness. Systems do not create such individuals; rather they selectively afford and reinforce skills and habits that are cultivated during years of training and practice. Stories of practice become living practical theories that help practitioners make sense of their professional lives [569], as well as guide their approach to patients in routine and novel situations where uncertainty and risk are high.

Phronesis, however, is not simply an individual quality. Even as every human being acts with a view to some good, so too the purpose of the organization is to create value [570]. Leaders in organizations with collective *phronesis* develop shared practices through which to detect, process, and

solve various challenges [571], such as patient safety. A safety strategy is not simply a written plan, but is actualized through practice. People learn to understand what *phronesis* is through practice, accomplished in interaction, and leading to organizational resilience. In a learning organization, contradictions are necessary for knowledge creation.

> Rather than seeking an optimal balance between contradictions, they are synthesized in dialectical thinking that negates the dichotomy and yields knowledge. By accepting contradiction, one is able to make the decision best suited to the situation without losing sight of the goodness to be achieved. The dialectical process of achieving the goal through social interaction is political, driven by the ability to make political judgements. [570, p. 14 of 24]

Care processes that have contributed to improvements in perceived safety in the emergency department, including the Rapid Assessment Zone and Diagnostic Treatment Unit, arose out of the challenges of providing care in the ED waiting room, and were achieved through the exercise of collective *phronesis*.

7.5 Summary

I suggest that patient safety in the context of a hospital ED is about giving account and learning in practice from success and failure, and about anticipation to create success. Thus, safety emerges out of dynamic interaction

embedded in shared practice, and "lives" in an ongoing conversation that fosters adaptive resilience. Hence, I claim that patient safety within the operational environment of an ED is most effectively created through dialogic storying, resilience, and *phronesis*.

I propose an approach to creating a culture of safety that includes an open communicative space to facilitate sharing of stories about patient safety incidents, a safety action team charged with systems analysis, feedback to practitioners, and empowered with them to enact change, and an inter-professional simulation learning environment to enhance communication, collaboration, and teamwork.

This learning depends upon the co-creation of understandings with colleagues about the dynamics of risks, and about the opportunities for enhancing safety. Hospital EDs are complex systems where clinicians need to respond quickly to the unfolding complexities of practice. Clinical work harbours unpredictabilities that require solutions that are different from those provided by the bureaucratic paradigm that privileges formal knowledge [572].

Rather, safe practice requires "error wisdom" [573] because the complexity of clinical work goes beyond what individuals know and exceeds what can be formalized as knowledge and rules. Hence, *phronesis* contributes to safe practice, and organizational and individual learning, when practitioners are given room to engender heedfulness to risk amidst the complexity of care, and to dynamically explore, negotiate, and render

rules, procedures and contexts relevant to their work [572].

7.6 Limitations

I did not sample all of the clinical roles found within the ED, nor did I include consultants, nurses or staff from other units that interact with the ED. Moreover, patients and families were not included, nor were regional and provincial decision makers. These exceptions limit my conclusions to the meso-level of the department, but nonetheless permit a holistic and contextual description of everyday practice in an ED that offers decision makers a view of the complexities and dynamics of emergency care.

Clinical work in an ED is distributed over patients, time, space, and care providers, and presents a practical impediment to observational research [300]. It is impossible to keep track of everything that is going on, leaving "shadow" observations even more fragmented than the work of individual providers or staff. Hence, any view is necessarily limited and incomplete.

My presence had an effect on the behaviour of study participants and other staff and care providers because of the sensitivity of being observed at work and the undercurrent of blame. The impact of this effect on clinical and operational communication and interactions, however, was mitigated by the flow and demand of the department. Alternately, my role as an observer may have put some at ease since I work in the department and most participants were habituated to my presence.

7.7 Implications

7.7.1 Theoretical

Through the lens of practice, the data support the interpretation of 'safety culture' in an ED as an action or doing, rather than something the system *is* or *has*. An ED is continually in the making, constructed and reconstructed in everyday practice with each inter-action. Moreover, rather than a unified 'safety culture', what emerged was a collage of inter-acting professional and group cultures. That is, the data are consistent with the concept of *habitus*, and point to the importance of inter-professional collaboration and education. In addition, the findings suggest that the construct of 'safety culture' is much broader and deeper than many models accommodate, for central to 'safety culture' is the issue of power. Advances in safety theory must therefore account for power relations. Furthermore, this suggests that 'safety culture' is neither a measurable construct, nor malleable in terms of the attitudes and perceptions of individual actors, and therefore cannot be approached from the reductionistic and instrumental epistemology of bureaucratic management. 'Safety culture', however, is observable, and can be described by observing how practitioners interact and communicate amidst the complexities of work.

7.7.2 Methodological

The main methodological implication of my findings is the limits of structured survey methods for elucidating and "measuring" 'safety culture'. The "questerview" data revealed that participants had differing interpretations of the meaning of the statements, and therefore responded to different concepts. Moreover, there was a tendency to neutralize their responses, and to gravitate towards the middle, rather than either end of the "spectrum". Thus what emerged from the "questerviews" was the ambiguity and nuance around the domains, as well as the safety-related themes that were not part of the standard statements on 'safety culture'. In addition, the PSHCO tool did not include a significant safety domain that is critically relevant to an ED — handoffs, transitions, and interactions.

7.7.3 Operational

Together, these theoretical and methodological implications invite a critical reappraisal of the goals and objectives of the BC Patient Safety & Learning System. First, 'safety culture' does not reside in the "attitudes and beliefs" of healthcare providers, but rather emerges in the dialectic of system and practice. Hence, the decontextualized and bureaucratic "measure and manage" process that the PSLS invites will not contribute to the creation of a culture of safety. Sadly, lack of analytic resources will limit "second stories" and will impede unit and system learning. Furthermore, the process of reporting and lack of feedback perpetuates the problematic employee-

manager structure, and will continue to constrain voice and engagement, and feed the sense of futility.

In contrast, focus on operational resilience offers more to engage clinicians, staff and leaders in (re)designing, organizing and managing their everyday work as they share stories of success and failure within a practice community. Appreciation of the situated and distributed nature of shared practice places emphasis on material anchors (tools or cognitive scaffolds such as the chart, PCIS, and whiteboard) that support dialogic sensemaking, and the need to foster an open communicative space for participation, deliberation and action.

7.7.4 Policy

The view from practice suggests that safety emerges out of interaction, dialogic sensemaking and collaboration, in which different "parts" of the health care system learn with and from one another and take "the other" into account in their own decisions and actions. This perspective recommends a dialogic approach that moves beyond the traditional dualism of "top-down" and "bottom-up" into a generative partnership between leadership and practitioners that overcomes the limitations of "top down" strategies that fail to account for practice and the prevailing conditions within health care organizations, and "bottom-up" initiatives that fail to connect with system-wide learning.

7.8 Recommendations

On the basis of my findings, conclusions, and their implications, I make the following actionable recommendations to support an ED to "create safety". The conceptual underpinnings of embedded and distributed dialogic inter-action and resilience recommend safety action as an inherent part of normal work. Therefore, the first group of recommendations attend to valuing safety and safety learning, then to our collective response to patients who have been injured, next to collaboration, and finally to fostering resilience.

Valuing Safety

- Enact Leadership Walk Rounds to engage leadership and staff in open discussions about patient safety and collaborative approaches for pragmatic practice-based solutions [574–576].

Safety Learning

- Foster a multidisciplinary open communicative space to facilitate an ongoing conversation about patient safety.
- Abandon the current incident reporting system.
- Create a safety learning communication tab in the PCIS, and set up a telephone answering machine. One question: "What happened?"
- Implement routine chart audit using electronic trigger tools.

- Reward 'Good Catches' and 'Success Stories'.
- Feedback all hospital discharge summaries related to patients admitted through the ED, and all "bouncebacks" within 48 hours.

Safety Action Team

- Create a multidisciplinary peer "safety action team" [548] charged with and empowered to act on promoting safety through deep "second story" systems analysis and feedback on PSIs.
- Route all confidential safety learning communication to the SAT for followup.
- SAT to use the PSLS (when available) to code and forward anonymized "second story" reports to leadership and risk management, to advocate for responses from management, and to take on the role of implementing changes.

Disclosure

- Implement a formal accountability and disclosure approach based on the Canadian Patient Safety Institute [577] and the Canadian Medical Protective Association [578] guidelines to patients (and their families) who have been injured in our care.

Resilience

- Urgently move forward on wireless communication technologies to offset the fragmentation of the physical space.
- Develop and implement a low-fidelity case-based team simulation program emphasizing communication, interaction and play, and fostering inter-professional collaboration.
- Create an organizational response to violence akin to trauma, sepsis, code MI and code stroke.
- Implement OCP proactively rather than reactively.
- Free up the Clinical Nurse Leader, the "general dogsbody person"[5], to allow for better operational oversight. The CNL is often busy doing other tasks, such as charting, getting/delivering meds, filling out SBAR forms, answering the phone, and so on, and thereby are constrained in fulfilling their position of operational oversight [see Section 6.2.2]. The CNL needs to have a good sense of the department at all times in order to facilitate resource matching.

7.9 Future Directions

Clinical work involves collaboration of different health care practitioners to provide safe, effective, and high quality care. Opportunities for health

[5]A self-referential term used by one of the CNLs that dates from the British Royal Navy and depicts a gofer or grunt, the person stuck with all the jobs nobody else wants

care practitioners to develop a shared meaning of practice are often constrained by organizational and professional agendas. Reflexive video analysis allows health care practitioners to critically engage with practice in a way that enables them to negotiate meaning and articulate "meta discursive" solutions [579]. Like a sport replay, the opportunity to see oneself in action can be a terrific learning opportunity as it reveals actions one simply assumes, and is powerfully challenging. This is worth exploring.

I also suggest that the organization, regional health authority, or governments go beyond disclosure to give serious consideration to restorative justice for patients who have been injured in our care. While I appreciate that there has been limited research on restorative justice in patient safety [580, 581], the dialogic principle of restorative justice is sound [582–584]. Apologies from health practitioners that are perceived as sincere reduce tort litigation [585]. Forgiveness is relational and "cheap grace" is to be avoided [586–588].

The potential also exists to work together with the recently launched Evidence to Excellence (E2E) BC Emergency Medicine Community of Practice funded through the BC Ministry of Health, Division of Clinical Innovation and Integration. The goal of the collaborative is "to improve operational and clinical practices in Emergency Departments across British Columbia." The objective would be to create a community of inquiry on patient safety under the E2E Community of Practice umbrella. Interaction with others is a vital ingredient in social learning where the empha-

sis is on collaboration, negotiation, debate and peer review, and is central to the constructivist learning approach. We would engage a community of learners in collaborative, reflective, and active exploration of patient safety in the ED to give a venue for voice, learning and construction of shared sensemaking.

7.10 Future Research

Further "talk-in-interaction" or conversation analysis of the communication observation data [149, 589] may assist in making visible how ED practitioners and staff develop and understand their contributions to interaction.

Additional in-depth "questerviews" and focus groups with patients and families, as well as with consultants, nurses, and staff from outside of the ED, prehospital care providers, and regional and provincial decision makers, will add to further understanding of the perceptions and politics of patient safety, and the situated context and complexity of ED care.

As well, further work using the Resilience Assessment Grid [539] at both the unit and organizational level, will offer additional direction for fostering system resilience in the ED.

7.11 Conclusion

Although the overall sense was that emergency care providers and staff do a "good" job of providing safe patient care within an environment under stress because of patient demand and lack of resources, patient safety is nevertheless continually threatened by space, staffing, security, and transitions of care, and there are gaps in valuing safety and learning. We make sense of risk and safety in everyday practice, but system learning is limited. Threats and hazards are identified and ascribed meaning through giving account in dialogue within a community of practice that is sensitive to the possibility of failure. Learning from success and failure leads to greater understanding and foresight than learning from failure alone. Safety emerges out of socio-technical interactions and human relationships based in trust, and "lives" in an ongoing conversation that fosters adaptive resilience. It is enacted between. I have offered recommendations to assist in facilitating that practice-based conversation, and to enhance collective *phronesis* and safety in the ED context.

7.12 Epilogue

> Ken returned by ambulance after I had left for the night. He was seizing. One of my colleagues repeated a head CT, which again was reported as "normal". A neurologist was consulted and a MR angiogram was done demonstrating a vertebral artery dissection and a cerebellar infarct with edema. Ken was intubated and taken to the Intensive Care Unit. His parents came from overseas. He died three days later from brainstem compression.

I have replayed Ken's story over and over many times and have with time come to accept that I could not have prevented it. But I have not let myself off lightly, for still I have a heavy heart about my involvement in the loss of a young life ...even as I write these lines. The power of the counterfactual has lessened with the years, but it lingers still. His story is now part of my story — my "complex sorrow" of action going wrong [590, p. 7].

Ken's story speaks directly to a fundamental challenge with patient safety, and with "diagnostic error" in particular — the challenge of hindsight bias. Ken died as a result of his injury. There would be no question that his death was related to the outcome of his injury had he not presented to a hospital. But he did present, and therefore there was an '"opportunity" that the course of his injury might have been different. This is

counterfactual.

As the person involved in that moment of opportunity, I made an "error" as per the accepted definition of error as "application of an incorrect plan". However, this attribution can *only* be made in hindsight with knowledge of the outcome. In the "error" counting view, I made a "diagnostic error", what some would judge to be a "no fault" error [274]. However, in the "new look" view from "inside the tunnel" [149], my clinical decision, made within a system of interactions, was both plausible, "normal", and reasonable.

Why did it make sense to me? Because his trauma seemed minimal, he had no hard cerebellar findings, his scan was negative, and he was leaving with friends. My colleagues agree that my action was reasonable given what was known. Finding a "needle in a haystack" is not an easy task. CT scans are insensitive for detecting infarcts in the cerebellum. Given the lack of clinical features I did not have much chance to make the correct diagnosis. We do not have the resources, nor would it be appropriate to perform a MR angiogram on every patient who hits their head and complains of dizziness. Hence, some further sign of cerebellar injury was required to prompt me to push the system. Therefore, the outcome was not preventable, defined as "accepted by the community as avoidable in the particular set of circumstances."

What remains open to interpretation is whether Ken suffered healthcare-associated harm. Did the delay in diagnosis contribute to his death?

It is possible, but not certain. I do not know. Was this a patient safety incident? If the delay did not contribute to his death, then this was not a PSI. We cannot know.

In contrast, consider again the story of system resonance [see Section 6.2.1] where Peter escaped from the department and presumably leaped to his death. Peter's case is more difficult to make sense of in the "medical error" paradigm because there is no individual "error", and instead attention is directed to the lack of mental health beds in the system — a political problem. There might have been a secure space to care for him, but all available spaces were occupied. The "sharp end" practitioners did what they could in the moment, and made the best they could with limited resources — even as I had done. No one imagined that Peter would escape out of the alarmed door of the department. It is unlikely that this case would have come to light if Peter had not died, and unlikely that it would be judged a case of "healthcare associated harm" because his death did not directly occur as a result of plans or actions taken during the provision of healthcare. Yet, it is an unequivocal example of a "blunt end" system problem where safety was compromised in brittle system interaction. Peter fell through the cracks.

The paradox presented by these two stories, speaks to the heart and meaning of patient safety. Both were stories of surprise. In Ken's story there was "error", but no safety incident, whereas in Peter's case there was a safety incident, but no "error". Notably, there was no system learning

from either. Indeed, during collection of the observation data, a volatile mentally ill patient was again placed where Peter had been, for the same reason (overcapacity), and with the same attendant risks to safety. The outcome, fortunately, turned out better.

Patients are placed at risk of harm in the ED through emergent system interactions, even as safety is created through dialogic interactions, resilience, and *phronesis*. Understanding how safety is created in everyday practice must therefore account for process, not outcome, and must be based on a theory of action, not "error" [591]. Thus, safety critical events must be evaluated from the perspective of the practitioner(s) or staff "inside the tunnel" — the choices that have to be made, the constraints imposed, the complexity (including the political/organizational dimensions at work) and resonance of the interacting elements of that context and the specific case at hand — so that the multiple options available to the decision maker(s) for action can be understood. This can be achieved through an understanding of the impact of the principles of safety that I have discussed: dialogic interaction for sensemaking, resilience, and *phronesis*.

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Appendix A

Instruments

Two 'safety culture' survey instruments were used in the course of the study: the Hospital Survey on Patient Safety Culture [15] and the Patient Safety in Healthcare Organizations Survey (Modified Stanford Instrument, 2007 version) [496, 497]. Copies of the survey instruments are attached.

HOSPITAL SURVEY ON PATIENT SAFETY CULTURE

INSTRUCTIONS

This survey asks for your opinions about patient safety issues, medical error, and event reporting in your hospital and will take about 10 to 15 minutes to complete.

- *An "event" is defined as any type of error, mistake, incident, accident, or deviation, regardless of whether or not it results in patient harm.*
- *"Patient safety" is defined as the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery.*

SECTION A: Your Work Area/Unit

In this survey, think of your "unit" as the work area, department, or clinical area of the hospital where you spend *most* of your work time or provide *most* of your clinical services.

What is your primary work area or unit in this hospital? Mark ONE answer by filling in the circle.

○ a. Many different hospital units/No specific unit

○ b. Medicine (non-surgical)
○ c. Surgery
○ d. Obstetrics
○ e. Pediatrics
○ f. Emergency department
○ g. Intensive care unit (any type)
○ h. Psychiatry/mental health
○ i. Rehabilitation
○ j. Pharmacy
○ k. Laboratory
○ l. Radiology
○ m. Anesthesiology
○ n. Other, please specify:

Please indicate your agreement or disagreement with the following statements about your work area/unit. Mark your answer by filling in the circle.

Think about your hospital work area/unit…	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
1. People support one another in this unit	①	②	③	④	⑤
2. We have enough staff to handle the workload	①	②	③	④	⑤
3. When a lot of work needs to be done quickly, we work together as a team to get the work done	①	②	③	④	⑤
4. In this unit, people treat each other with respect	①	②	③	④	⑤
5. Staff in this unit work longer hours than is best for patient care	①	②	③	④	⑤
6. We are actively doing things to improve patient safety	①	②	③	④	⑤
7. We use more agency/temporary staff than is best for patient care	①	②	③	④	⑤
8. Staff feel like their mistakes are held against them	①	②	③	④	⑤
9. Mistakes have led to positive changes here	①	②	③	④	⑤
10. It is just by chance that more serious mistakes don't happen around here	①	②	③	④	⑤
11. When one area in this unit gets really busy, others help out	①	②	③	④	⑤
12. When an event is reported, it feels like the person is being written up, not the problem	①	②	③	④	⑤

SECTION A: Your Work Area/Unit (continued)

Think about your hospital work area/unit…	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
13. After we make changes to improve patient safety, we evaluate their effectiveness	①	②	③	④	⑤
14. We work in "crisis mode" trying to do too much, too quickly	①	②	③	④	⑤
15. Patient safety is never sacrificed to get more work done	①	②	③	④	⑤
16. Staff worry that mistakes they make are kept in their personnel file	①	②	③	④	⑤
17. We have patient safety problems in this unit	①	②	③	④	⑤
18. Our procedures and systems are good at preventing errors from happening	①	②	③	④	⑤

SECTION B: Your Supervisor/Manager

Please indicate your agreement or disagreement with the following statements about your immediate supervisor/manager or person to whom you directly report. Mark your answer by filling in the circle.

	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures	①	②	③	④	⑤
2. My supervisor/manager seriously considers staff suggestions for improving patient safety	①	②	③	④	⑤
3. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts	①	②	③	④	⑤
4. My supervisor/manager overlooks patient safety problems that happen over and over	①	②	③	④	⑤

SECTION C: Communications

How often do the following things happen in your work area/unit? Mark your answer by filling in the circle.

Think about your hospital work area/unit…	Never ▼	Rarely ▼	Some-times ▼	Most of the time ▼	Always ▼
1. We are given feedback about changes put into place based on event reports	①	②	③	④	⑤
2. Staff will freely speak up if they see something that may negatively affect patient care	①	②	③	④	⑤
3. We are informed about errors that happen in this unit	①	②	③	④	⑤
4. Staff feel free to question the decisions or actions of those with more authority	①	②	③	④	⑤
5. In this unit, we discuss ways to prevent errors from happening again	①	②	③	④	⑤
6. Staff are afraid to ask questions when something does not seem right	①	②	③	④	⑤

SECTION D: Frequency of Events Reported

In your hospital work area/unit, when the following mistakes happen, *how often are they reported?* Mark your answer by filling in the circle.

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

SECTION E: Patient Safety Grade

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

○	○	○	○	○
A	**B**	**C**	**D**	**E**
Excellent	Very Good	Acceptable	Poor	Failing

SECTION F: Your Hospital

Please indicate your agreement or disagreement with the following statements about your hospital. Mark your answer by filling in the circle.

Think about your hospital…	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
1. Hospital management provides a work climate that promotes patient safety	①	②	③	④	⑤
2. Hospital units do not coordinate well with each other	①	②	③	④	⑤
3. Things “fall between the cracks” when transferring patients from one unit to another	①	②	③	④	⑤
4. There is good cooperation among hospital units that need to work together	①	②	③	④	⑤
5. Important patient care information is often lost during shift changes	①	②	③	④	⑤
6. It is often unpleasant to work with staff from other hospital units	①	②	③	④	⑤
7. Problems often occur in the exchange of information across hospital units	①	②	③	④	⑤
8. The actions of hospital management show that patient safety is a top priority	①	②	③	④	⑤
9. Hospital management seems interested in patient safety only after an adverse event happens	①	②	③	④	⑤
10. Hospital units work well together to provide the best care for patients	①	②	③	④	⑤
11. Shift changes are problematic for patients in this hospital	①	②	③	④	⑤

SECTION G: Number of Events Reported

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

- ○ a. No event reports
- ○ b. 1 to 2 event reports
- ○ c. 3 to 5 event reports
- ○ d. 6 to 10 event reports
- ○ e. 11 to 20 event reports
- ○ f. 21 event reports or more

SECTION H: Background Information

This information will help in the analysis of the survey results. Mark ONE answer by filling in the circle.

1. How long have you worked in this hospital?
   - ○ a. Less than 1 year
   - ○ b. 1 to 5 years
   - ○ c. 6 to 10 years
   - ○ d. 11 to 15 years
   - ○ e. 16 to 20 years
   - ○ f. 21 years or more

2. How long have you worked in your current hospital work area/unit?
   - ○ a. Less than 1 year
   - ○ b. 1 to 5 years
   - ○ c. 6 to 10 years
   - ○ d. 11 to 15 years
   - ○ e. 16 to 20 years
   - ○ f. 21 years or more

3. Typically, how many hours per week do you work in this hospital?
   - ○ a. Less than 20 hours per week
   - ○ b. 20 to 39 hours per week
   - ○ c. 40 to 59 hours per week
   - ○ d. 60 to 79 hours per week
   - ○ e. 80 to 99 hours per week
   - ○ f. 100 hours per week or more

4. What is your staff position in this hospital? Mark ONE answer that best describes your staff position.
   - ○ a. Registered Nurse
   - ○ b. Physician Assistant/Nurse Practitioner
   - ○ c. LVN/LPN
   - ○ d. Patient Care Assistant/Hospital Aide/Care Partner
   - ○ e. Attending/Staff Physician
   - ○ f. Resident Physician/Physician in Training
   - ○ g. Pharmacist
   - ○ h. Dietician
   - ○ i. Unit Assistant/Clerk/Secretary
   - ○ j. Respiratory Therapist
   - ○ k. Physical, Occupational, or Speech Therapist
   - ○ l. Technician (e.g., EKG, Lab, Radiology)
   - ○ m. Administration/Management
   - ○ n. Other, please specify:

5. In your staff position, do you typically have direct interaction or contact with patients?
   - ○ a. YES, I typically have direct interaction or contact with patients.
   - ○ b. NO, I typically do NOT have direct interaction or contact with patients.

6. How long have you worked in your current specialty or profession?
   - ○ a. Less than 1 year
   - ○ b. 1 to 5 years
   - ○ c. 6 to 10 years
   - ○ d. 11 to 15 years
   - ○ e. 16 to 20 years
   - ○ f. 21 years or more

SECTION I: Your Comments

Please feel free to write any comments about patient safety, error, or event reporting in your hospital.

THANK YOU FOR COMPLETING THIS SURVEY.

Patient Safety Culture in Healthcare Organizations Survey

Instructions:

1. Think of unit as the area where you do most of your work—whether that is a patient care unit / ward, clinic, dept., the community, EMS, etc.. Think of the patient as the client, resident, etc., depending where your work.
2. The survey is seeking your perceptions and opinions of these safety issues. Indicate the extent to which you agree or disagree with each of the following statements. If you are unsure whether you agree or disagree, mark "neutral". If the question does not apply to your role or your work setting, mark "not applicable".

***Patient Safety*:** Activities to avoid, prevent, or correct adverse outcomes which may result from the delivery of health care.

		strongly disagree	disagree	neutral	agree	strongly agree	not applicable
1.	Patient safety decisions are made at the proper level by the most qualified people	❍	❍	❍	❍	❍	❍
2.	Good communication flow exists up the chain of command regarding patient safety issues	❍	❍	❍	❍	❍	❍
3.	Reporting a patient safety problem will result in negative repercussions for the person reporting it	❍	❍	❍	❍	❍	❍
4.	Senior management has a clear picture of the risk associated with patient care	❍	❍	❍	❍	❍	❍
5.	My unit takes the time to identify and assess risks to patients	❍	❍	❍	❍	❍	❍
6.	My unit does a good job managing risks to ensure patient safety	❍	❍	❍	❍	❍	❍
7.	Senior management provides a climate that promotes patient safety	❍	❍	❍	❍	❍	❍
8.	Asking for help is a sign of incompetence	❍	❍	❍	❍	❍	❍
9.	If I make a mistake that has significant consequences and nobody notices, I do not tell anyone about it	❍	❍	❍	❍	❍	❍
10.	I am sure that if I report an incident to our reporting system, it will not be used against me	❍	❍	❍	❍	❍	❍
11.	I am less effective at work when I am fatigued	❍	❍	❍	❍	❍	❍
12.	Senior management considers patient safety when program changes are discussed	❍	❍	❍	❍	❍	❍
13.	Personal problems can adversely affect my performance	❍	❍	❍	❍	❍	❍
14.	I will suffer negative consequences if I report a patient safety problem	❍	❍	❍	❍	❍	❍
15.	If I report a patient safety incident, I know that management will act on it	❍	❍	❍	❍	❍	❍
16.	I am rewarded for taking quick action to identify a serious mistake	❍	❍	❍	❍	❍	❍
17.	Loss of experienced personnel has negatively affected my ability to provide high quality patient care	❍	❍	❍	❍	❍	❍
18.	I have enough time to complete patient care tasks safely	❍	❍	❍	❍	❍	❍
19.	I am not sure about the value of completing incident reports	❍	❍	❍	❍	❍	❍
20.	In the last year, I have witnessed a co-worker do something that appeared to me to be unsafe for the patient in order to save time	❍	❍	❍	❍	❍	❍
21.	I am provided with adequate resources (personnel, budget, and equipment) to provide safe patient care	❍	❍	❍	❍	❍	❍
22.	I have made significant errors in my work that I attribute to my own fatigue	❍	❍	❍	❍	❍	❍
23.	I believe that health care error constitutes a real and significant risk to the patients that we treat	❍	❍	❍	❍	❍	❍
24.	I believe health care errors often go unreported	❍	❍	❍	❍	❍	❍
25.	My organization effectively balances the need for patient safety and the need for productivity	❍	❍	❍	❍	❍	❍
26.	I work in an environment where patient safety is a high priority	❍	❍	❍	❍	❍	❍
27.	Staff are given feedback about changes put into place based on incident reports	❍	❍	❍	❍	❍	❍
28.	Individuals involved in patient safety incidents have a quick and easy way to report what happened	❍	❍	❍	❍	❍	❍
29.	My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures	❍	❍	❍	❍	❍	❍
30.	My supervisor/manager seriously considers staff suggestions for improving patient safety	❍	❍	❍	❍	❍	❍
31.	Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts	❍	❍	❍	❍	❍	❍
32.	My supervisor/manager overlooks patient safety problems that happen over and over	❍	❍	❍	❍	❍	❍

	strongly disagree	disagree	neutral	agree	strongly agree	not applicable
33. On this unit, when an incident occurs, we think about it carefully	❍	❍	❍	❍	❍	❍
34. On this unit, when people make mistakes, they ask others about how they could have prevented it	❍	❍	❍	❍	❍	❍
35. On this unit, after an incident has occurred, we think about how it came about and how to prevent the same mistake in the future	❍	❍	❍	❍	❍	❍
36. On this unit, when an incident occurs, we analyze it thoroughly	❍	❍	❍	❍	❍	❍
37. On this unit, it is difficult to discuss errors	❍	❍	❍	❍	❍	❍
38. On this unit, after an incident has occurred, we think long and hard about how to correct it	❍	❍	❍	❍	❍	❍

B. These questions are about your perceptions of overall patient safety

	A - Excellent	B - Very Good	C - Acceptable	D - Poor	F - Failing
39. Please give your unit an overall grade on patient safety	❍	❍	❍	❍	❍
40. Please give the organization an overall grade on patient safety	❍	❍	❍	❍	❍

C. These questions are about what happens after a Major Event

***Major Events*:** Incidents causing fairly serious harm to patients that result from the delivery of health care.

	strongly disagree	disagree	neutral	agree	strongly agree	not applicable
41. Individuals involved in major events contribute to the understanding and analysis of the event and the generation of possible solutions	❍	❍	❍	❍	❍	❍
42. A formal process for disclosure of major events to patients/families is followed and this process includes support mechanisms for patients, family, and care/service providers.	❍	❍	❍	❍	❍	❍
43. Discussion around major events focuses mainly on system-related issues, rather than focusing on the individual(s) most responsible for the event	❍	❍	❍	❍	❍	❍
44. The patient and family are invited to be *directly* involved in the entire process of understanding: what happened following a major event and generating solutions for reducing re-occurrence of similar events	❍	❍	❍	❍	❍	❍
45. Things that are learned from major events are communicated to staff on our unit using *more than* one method (e.g. communication book, in-services, unit rounds, emails) and / or at *several* times so all staff hear about it	❍	❍	❍	❍	❍	❍
46. Changes are made to reduce re-occurrence of major events	❍	❍	❍	❍	❍	❍

D. Finally, please help us by providing the following information:

Setting where most of your work time is spent:
- ❍ Acute in-patient
- ❍ Long term /continuing care
- ❍ Community
- ❍ Different settings/ no specific setting

Sector where most of your work time is spent:
- ❍ General adult
- ❍ Paediatric
- ❍ Mental health
- ❍ Chronic care
- ❍ Other:_____

Age:
- ❍ <=30
- ❍ 31-40
- ❍ 41-50
- ❍ 51-60
- ❍ >60

Time in organization:
- ❍ < 1 yr
- ❍ 1-2 yrs
- ❍ 3-5 yrs
- ❍ 6-10 yrs
- ❍ > 10 yrs

Gender:
- ❍ Female
- ❍ Male

Your role:
- ❍ RN / R/LPN
- ❍ MD
- ❍ EMS
- ❍ Allied health
- ❍ Healthcare Aide
- ❍ Clinical educator
- ❍ Clinical care manager
- ❍ Technician (lab, radiology, etc.)
- ❍ Unit clerk / clinic reception
- ❍ Support services (food services, housekeeping, maintenance)
- ❍ Other:_____

YORK UNIVERSITÉ UNIVERSITY

Thank you for taking the time to complete this survey
Please return in the enclosed postage-paid envelope

Adapted with permission from:
CHP PCOR STANFORD
PSCI Patient Safety Center of Inquiry

Appendix B

Ethics

Ethics approval was granted by the UBC Behavioural Research Ethics Board (H05-80877) and the Providence Health Care Research Ethics Board (H05-50256) in November 2005. The file was assigned to the Providence Health Care Research Ethics Board in 2007, and amendments to the study approved in 2008. Ethics approval for publication of the analysis of the organizational patient safety culture survey, originally conducted as a quality improvement project, was granted in August 2010. Copies of the Approval Certificates are attached.

UBC/PROVIDENCE HEALTH CARE
OFFICE OF RESEARCH SERVICES
Research Ethics Board

Certificate of Expedited Approval*

*** PLEASE NOTE: This does not mean final project approval has been granted.**
Final project approval will be granted when the Office of Research Services receives the following approval(s).

Cardiac/ECG	☐	**Nursing**	☐	**Radiology/Cath Lab**	☐	**Other**	☐	**No approvals**	
Laboratory	☐	**Pharmacy**	☐	**Respiratory**	☐	**CONTRACT**	☐	**required**	☒

Principal Investigator:	Department:	Reference Number:
Dr. Garth Hunte	Health Care/Epidemiology	P05-0256

Institution(s) Where Research Will be Carried Out:
St Paul's Hospital, Vancouver General Hospital

Co-investigators:
S. Shep, R. Abu-Laban, J. Brubacher, J.Shepherd, JA Shoveller

Sponsoring Agencies:
Canadian Medical Protective Association

Project Title:
Creating Safety In Emergency Medicine

Documents Included In This Approval:	Term (Years)	Date Approved
Application, Research Proposal Grant 2005; Introductory Letter (November 22, 2005); Interview Consent Form (November 22, 2005); Hospital Survey on Patient Safety Culture;	1	November 22, 2005

The UBC/PHC REB has reviewed the documentation included for the above-named project, and the research study, as presented in the documentation, was found to be acceptable on ethical grounds for research involving human subjects.

The UBC/PHC REB approval for this study expires one year from the approval date.

CERTIFICATION
In respect of clinical trials:

1. The membership of this Research Ethics Board complies with the membership requirements for Research Ethics Boards as defined in part C Division 5 of the *Food and Drug Regulations.*
2. This Research Ethics Board carries out its functions in a manner consistent with Good Clinical Practices and
3. This Research Ethics Board has reviewed and approved the clinical trial protocol and informed consent form for the trial, which is to be conducted by the qualified investigator named above at the specified clinical trial site. This approval and the views of this Research Ethics Board have been documented in writing.

Approval of the Clinical Research Ethics Board by one of:
Dr. I. Fedoroff, Chair
Dr. A. McLeod, Associate Chair

Date: November 22, 2005

UBC-Providence Health Care
Research Institute
Office of Research Services
11th Floor Hornby Site - SPH
c/o 1081 Burrard St.
Vancouver, BC V6Z 1Y6
Tel: (604) 806-8567
Fax: (604) 806-8568

ETHICS CERTIFICATE OF EXPEDITED APPROVAL: ANNUAL RENEWAL

PRINCIPAL INVESTIGATOR:	DEPARTMENT:	UBC-PHC REB NUMBER:
Garth Hunte	Family Practice	H05-50256

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:

N/A

Other locations where the research will be conducted:

N/A

CO-INVESTIGATOR(S):

Drs. S. Shep, R. Abu-Laban, J. Brubacher, J. Shepherd, JA Shoveller

SPONSORING AGENCIES:

The Canadian Medical Protective Association

PROJECT TITLE:

Creating Safety in Emergency Medicine

EXPIRY DATE OF THIS APPROVAL: November 28, 2007

APPROVAL DATE: November 28, 2006

CERTIFICATION:

1. The membership of the UBC-PHC REB complies with the membership requirements for research ethics boards defined in Part C Division 5 of the Food and Drug Regulations of Canada.
2. The UBC-PHC REB carries out its functions in a manner fully consistent with Good Clinical Practices.
3. The UBC-PHC REB has reviewed and approved the research project named on this Certificate of Approval including any associated consent form and taken the action noted above. This research project is to be conducted by the principal investigator named above at the specified research site(s). This review of the UBC-PHC REB have been documented in writing.

The UBC-PHC Research Ethics Board Chair or Associate Chair, has reviewed the documentation for the above named project. The research study, as presented in the documentation, was found to be acceptable on ethical grounds for research involving human subjects and was approved for renewal.

Approval of the UBC-PHC Research Ethics Board or Associate Chair, verified by the above signature of one of the

Dr. I. Fedoroff, Chair **or** **Dr. A. McLeod, Associate Chair**

UBC-Providence Health Care
Research Institute
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11th Floor Hornby Site - SPH
c/o 1081 Burrard St.
Vancouver, BC V6Z 1Y6
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Fax: (604) 806-8568

ETHICS CERTIFICATE OF EXPEDITED APPROVAL: ANNUAL RENEWAL

PRINCIPAL INVESTIGATOR:	DEPARTMENT:	UBC-PHC REB NUMBER:
Garth Hunte	PHCRI	H05-50256

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:

N/A

Other locations where the research will be conducted:

N/A

CO-INVESTIGATOR(S):

N/A

SPONSORING AGENCIES:

The Canadian Medical Protective Association

PROJECT TITLE:

Creating Safety in Emergency Medicine

EXPIRY DATE OF THIS APPROVAL: December 3, 2008

APPROVAL DATE: December 3, 2007

CERTIFICATION:

1. The membership of the UBC-PHC REB complies with the membership requirements for research ethics boards defined in Part C Division 5 of the Food and Drug Regulations of Canada.
2. The UBC-PHC REB carries out its functions in a manner fully consistent with Good Clinical Practices.
3. The UBC-PHC REB has reviewed and approved the research project named on this Certificate of Approval including any associated consent form and taken the action noted above. This research project is to be conducted by the principal investigator named above at the specified research site(s). This review of the UBC-PHC REB have been documented in writing.

The UBC-PHC Research Ethics Board Chair or Associate Chair, has reviewed the documentation for the above named project. The research study, as presented in the documentation, was found to be acceptable on ethical grounds for research involving human subjects and was approved for renewal.

Approval of the UBC-PHC Research Ethics Board or Associate Chair, verified by the signature of one of the following:

Dr. I. Fedoroff, Chair	Dr. J. Kernahan, Associate Chair

UBC-Providence Health Care
Research Institute
Office of Research Services
11th Floor Hornby Site - SPH
c/o 1081 Burrard St.
Vancouver, BC V6Z 1Y6
Tel: (604) 806-8567
Fax: (604) 806-8568

ETHICS CERTIFICATE OF FULL BOARD APPROVAL: AMENDMENT

PRINCIPAL INVESTIGATOR:	DEPARTMENT:	UBC-PHC REB NUMBER:
Garth Hunte	Family Practice	H05-50256

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:

Institution	Site
Providence Health Care	St. Paul's Hospital

Other locations where the research will be conducted:
Not applicable

CO-INVESTIGATOR(S):

Jeffrey R. Brubacher
Samuel B. Sheps

SPONSORING AGENCIES:

The Canadian Medical Protective Association

PROJECT TITLE:
Creating Safety in Emergency Medicine (H05-50256-002)

REMINDER: The current UBC-PHC REB approval for this study expires: 03 December 2008

AMENDMENTS BELOW REVIEWED AT REB FULL BOARD MEETING DATE:	THE FOLLOWING REB MEMBERS DID NOT ATTEND THE DISCUSSION OR VOTE FOR THE ABOVE STUDY AT THIS REB MEETING REVIEW DUE TO A POTENTIAL CONFLICT OF INTEREST:
January 25, 2008	N/A

AMENDMENT(S):

AMENDMENT APPROVAL DATE:
March 23, 2008

Document Name	Version	Date
Protocol:		
Revised protocol	071130	November 30, 2007
Consent Forms:		
Observation consent	071130	November 30, 2007

Focus group consent	071128	November 28, 2007
Questionnaire, Questionnaire Cover Letter, Tests:		
Focus group script	071130	November 30, 2007
Participant verbal script	080305	March 5, 2008
Letter of Initial Contact:		
Invitation letter	071130	November 30, 2007
Other Documents:		
Patient information letter	080315	March 15, 2008
Public-patient ED poster	080315	March 15, 2008
Healthcare provider ED poster	080305	March 5, 2008

CERTIFICATION:

1. The membership of the UBC-PHC REB complies with the membership requirements for research ethics boards defined in Part C Division 5 of the Food and Drug Regulations of Canada.
2. The UBC-PHC REB carries out its functions in a manner fully consistent with Good Clinical Practices.
3. The UBC-PHC REB has reviewed and approved the research project named on this Certificate of Approval including any associated consent form and taken the action noted above. This research project is to be conducted by the principal investigator named above at the specified research site(s). This review of the UBC-PHC REB have been documented in writing.

The amendment(s) for the above-named project has been reviewed by the **full UBC-PHC Research Ethics Board Chair or Associate Chair**, as presented in the documentation and the accompanying documentation was found to be acceptable on ethical grounds for research involving human subjects.

Approval of the UBC-PHC Research Ethics Board or Associate Chair, verified by the signature of one of the following:

Dr. I. Fedoroff,
Chair

Dr. J. Kernahan,
Associate Chair

UBC-Providence Health Care
Research Institute
Office of Research Services
11th Floor Hornby Site - SPH
c/o 1081 Burrard St.
Vancouver, BC V6Z 1Y6
Tel: (604) 806-8567
Fax: (604) 806-8568

ETHICS CERTIFICATE OF EXPEDITED APPROVAL: ANNUAL RENEWAL

PRINCIPAL INVESTIGATOR:	DEPARTMENT:	UBC-PHC REB NUMBER:
Garth Hunte	Medicine	H05-50256

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:

Institution	Site
Providence Health Care	St. Paul's Hospital

Other locations where the research will be conducted:
Not applicable

CO-INVESTIGATOR(S):

Jeffrey R. Brubacher
Samuel B. Sheps

SPONSORING AGENCIES:

The Canadian Medical Protective Association

PROJECT TITLE:
Creating Safety in Emergency Medicine

EXPIRY DATE OF THIS APPROVAL: November 28, 2009

APPROVAL DATE: November 28, 2008

CERTIFICATION:

1. The membership of the UBC-PHC REB complies with the membership requirements for research ethics boards defined in Part C Division 5 of the Food and Drug Regulations of Canada.
2. The UBC-PHC REB carries out its functions in a manner fully consistent with Good Clinical Practices.
3. The UBC-PHC REB has reviewed and approved the research project named on this Certificate of Approval including any associated consent form and taken the action noted above. This research project is to be conducted by the principal investigator named above at the specified research site(s). This review of the UBC-PHC REB have been documented in writing.

The UBC-PHC Research Ethics Board Chair or Associate Chair, has reviewed the documentation for the above named project. The research study, as presented in the documentation, was found to be acceptable on ethical grounds for research involving human subjects and was approved for renewal.

Approval of the UBC-PHC Research Ethics Board or Associate Chair, verified by the signature of one of the following:

Dr. I. Fedoroff,	Dr. J. Kernahan,	Dr. Kuo-Hsing Kuo,
Chair	Associate Chair	Associate Chair

UBC-Providence Health Care
Research Institute
Office of Research Services
11th Floor Hornby Site - SPH
c/o 1081 Burrard St.
Vancouver, BC V6Z 1Y6
Tel: (604) 806-8567
Fax: (604) 806-8568

ETHICS CERTIFICATE OF EXPEDITED APPROVAL: ANNUAL RENEWAL

PRINCIPAL INVESTIGATOR:	DEPARTMENT:	UBC-PHC REB NUMBER:
Garth Hunte		H05-50256

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:

Institution	Site
Providence Health Care	St. Paul's Hospital

Other locations where the research will be conducted:
Not applicable

CO-INVESTIGATOR(S):

Jeffrey R. Brubacher
Samuel B. Sheps

SPONSORING AGENCIES:

The Canadian Medical Protective Association

PROJECT TITLE:
Creating Safety in Emergency Medicine (H05-50256-002)

EXPIRY DATE OF THIS APPROVAL: December 1, 2010

APPROVAL DATE: December 1, 2009

CERTIFICATION:

1. The membership of the UBC-PHC REB complies with the membership requirements for research ethics boards defined in Part C Division 5 of the Food and Drug Regulations of Canada.
2. The UBC-PHC REB carries out its functions in a manner fully consistent with Good Clinical Practices.
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The UBC-PHC Research Ethics Board Chair or Associate Chair, has reviewed the documentation for the above named project. The research study, as presented in the documentation, was found to be acceptable on ethical grounds for research involving human subjects and was approved for renewal.

Approval of the UBC-PHC Research Ethics Board or Associate Chair, verified by the signature of one of the following:

Dr. Kuo-Hsing Kuo, Chair	**Dr. J. Kernahan, Associate Chair**	**Dr. I. Fedoroff, Associate Chair**

UBC-Providence Health Care
Research Institute
Office of Research Services
11th Floor Hornby Site - SPH
c/o 1081 Burrard St.
Vancouver, BC V6Z 1Y6
Tel: (604) 806-8567
Fax: (604) 806-8568

ETHICS CERTIFICATE OF EXPEDITED APPROVAL

PRINCIPAL INVESTIGATOR:	DEPARTMENT:	UBC-PHC REB NUMBER:
Garth Hunte	UBC/Medicine, Faculty of/Family Practice	H07-02755

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:

Institution	Site
Providence Health Care	St. Paul's Hospital

Other locations where the research will be conducted:
Not applicable

COINVESTIGATOR(S):

Samuel B. Sheps

SPONSORING AGENCIES:

Providence Health Care - "Perceptions on patient safety culture"

PROJECT TITLE:
Perceptions of patient safety culture in an emergency department

THE CURRENT UBC-PHC REB APPROVAL FOR THIS STUDY EXPIRES: August 9, 2011

The UBC-PHC Research Ethics Board Chair or Associate Chair, has reviewed the above described research project, including associated documentation noted below, and finds the research project acceptable on ethical grounds for research involving human subjects and hereby grants approval.

DOCUMENTS INCLUDED IN THIS APPROVAL:	APPROVAL DATE:
	August 9, 2010

Document Name	Version	Date
Protocol:		
Perceptions of patient safety in an emergency department	N/A	May 1, 2010
Questionnaire, Questionnaire Cover Letter, Tests:		
Instructions	N/A	November 29, 2007
Survey	2007 MSI	November 29, 2007
Letter of Initial Contact:		
Invitation letter	071108	November 8, 2007
Other Documents:		
Web page	071129	November 29, 2007

Other:
http://survey.agili-t.com

CERTIFICATION:

1. The membership of the UBC-PHC REB complies with the membership requirements for research ethics boards defined in Part C Division 5 of the Food and Drug Regulations of Canada.
2. The UBC-PHC REB carries out its functions in a manner fully consistent with Good Clinical Practices.
3. The UBC-PHC REB has reviewed and approved the research project named on this Certificate of Approval including any associated consent form and taken the action noted above. This research project is to be conducted by the principal investigator named above at the specified research site(s). This review of the UBC-PHC REB have been documented in writing.

Approval of the UBC-PHC Research Ethics Board or Associate Chair, verified by the signature of one of the following:

Dr. Kuo-Hsing Kuo, Chair	Dr. J. Kernahan, Associate Chair	Dr. I. Fedoroff, Associate Chair