APPLYING DESIGN SCIENCE TO ADDRESS HEALTH SYSTEM PROBLEMS:

A CASE OF DESIGNING COMMUNICATION TO MANAGE

CLINICIAN ANONYMITY IN AN ACADEMIC HOSPITAL

by

LORA APPEL

A Dissertation submitted to the

Graduate School – New Brunswick

Rutgers, The State University of New Jersey

In partial fulfillment of the requirements

For the degree of

Doctor of Philosophy

Graduate Program in Communication, Information, and Library Studies

Written under the direction of

Dr. Mark Aakhus

And approved by

_____

_____

_____

_____

New Brunswick, New Jersey

May, 2016

ABSTRACT OF THE DISSERTATION

Applying Design Science in to Address Health System Problems:

A Case of Designing Communication to Manage

Clinician Anonymity in an Academic Hospital

By LORA APPEL

Dissertation Director:

Dr. Mark Aakhus

This study focused on two novel elements: studying the phenomenon of 'clinician anonymity' and its effects on inter-professional communication in hospital practice and applying design science theory and methodology to understand and address communication problems.

Healthcare is characterized by "more to do, more to know, more to manage, and more people involved than ever before." This reality brings challenges to staff working in rapidly changing teams and stressful environments. The inability to recognize colleagues and the general lack of familiarity within teams undermines the effective collaboration that is critical to the delivery of patient care. This phenomenon, termed 'clinician anonymity,' was neither well defined nor understood, and few studies focused on interventions that addressed its causes and effects.

In order to evaluate how an intervention, both the design of an artifact and the process of its design, influence the phenomenon of clinician anonymity, a longitudinal,

mixed methods (observations, interviews, surveys) study was conducted at a large urban teaching hospital in Toronto, Canada. Based on existing frameworks and drawing from initial observations, a theoretical model of clinician anonymity was developed. The model informed the initial requirements for 'Face2Name,' a tool designed to act on the communication practices linked to anonymity. Pre- and post-intervention data comprising of 158 hours of observations over 8 months, 14 semi-structured interviews, and over 250 surveys were collected at four points in time.

Results showed strong evidence of clinician anonymity in hospitals and revealed that the predominant cause is the nature of teaching hospitals, characterized by rapidly changing fluid teams, organizational structures and power dynamics between professions that dictate how collaborative processes and standard procedures are performed. Evaluation of the intervention confirmed the benefits of a visual tool on recall and staff satisfaction and user feedback contributed to making each subsequent iteration better suited to staff workflow and the hospital environment. Results also revealed that the process of designing and deploying the tool was more effective in addressing the problem of anonymity than the artifact itself, confirming a main tenet of design science that the intervention is both process and resulting product.

Findings from this study are of value within and also outside the hospital, generalizable to other environments with fluid teams or with similar institutional cultures. Moreover, the reflective process intrinsic to design science provided considerable insights on how to conduct future design studies in the context of communication research.

ACKNOWLEDGEMENTS

DEDICATION

To my dad (tateh)

For getting me into this mess, and

To my mom (mamu)

For getting me out of it!

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE: INTRODUCTION

The ability for health professionals to confidently identify colleagues on their

medical team is beneficial to effective and efficient collaboration (Jones & Jones, 2011;

Laschinger & Finegan, 2005). Knowing what professional role is responsible for which

aspects of patient care, and at the same time who on the team has that profession (role),

improves teamwork, facilitates communication, and increases workflow efficiency. This

becomes complex when there is not a one to one relationship between individual

clinicians and the clinician roles and responsibilities. On average, teams with over twenty

different clinicians with various skills and responsibilities collaborate in the care of each

admitted hospital patient. Recognizing, getting to know each other, and communicating

effectively is nearly impossible for hospital staff that works in various services and

departments, and is located across several floors or wards, even if they work together to

provide care to the same patients. Teaching hospitals present a distinctly challenging

situation: nurses' schedules change daily as they move between three different shifts,

while physicians, medical residents and medical students "rotate" as frequently as every

week (Zwarenstein, 2007) in addition to having on-call assignments and weekend shifts.

Still, these clinicians must communicate effectively and efficiently to coordinate care for

their patients. Breakdowns in communication have been identified in such fundamental

aspects as the ability for healthcare professionals to identify their colleagues by sight or

name. "*I don't even know her name and I've been here for eight weeks and she's seen

patients that I've referred to her and it's kind of unfortunate*"

[I.06.03.2014.MedicalStudent]

The subject of this research is concerned with the phenomenon of *clinician anonymity* and how it impacts inter-professional communication and teamwork in healthcare contexts, and more specifically in hospital settings. Recognizing that clinician anonymity can pose fundamental problems for the quality of care, staff at a metropolitan hospital in Canada sought an approach to improve inter-professional communication. While there is an appreciation of the problem and its likely causes, there is a limited understanding of what organizational and technological practices could effectively address the problem. Moreover, the dominant practice in healthcare has been to attack problems from a traditionally deductive approach without sufficient attention to end-users and context. Yet in the hospital environment there is a need to begin addressing issues rapidly while also taking into account the actual needs of diverse users. For this study *design science* was chosen as a means to understand, inform and improve aspects of inter-professional communication derived from anonymity in hospitals. Design science provides a new perspective to address healthcare problems by engaging stakeholders who are interested in immediately implementing good ideas while also engaging them in a process of developing and refining the resulting solutions through reflection on evidence of actual uses and impacts. What is essential to a design approach in healthcare is design thinking, which incorporates contextual factors while emphasizing end user's needs (Brown, 2008). The intended contributions of design science methodology are thus both theoretical and practical.

Research Questions

This study will be instrumental to the understanding of two novel elements in the field of communication: (1) the phenomenon of clinician anonymity and its effects on

inter-professional communication; and, (2) how to apply design science theory and methodology to understand and address communication problems. The following research question focuses the study, determines the methodology, and guides all stages of inquiry, analysis, and reporting.

RQ: How does the intervention – that is, the design of the artifact and the process of its design – influence the phenomenon of clinician anonymity?

- Do the various interventions manage clinician anonymity?
- Does the process of involving end users in the design and implementation of the intervention reduce clinician anonymity and increase the sustainability and success of the various interventions?

Design thinking posits that the first step in effectively designing an intervention is to understand the context in which the intervention will be introduced. It is therefore necessary to explore secondary research questions (RQa, RQb) in order to inform the main research question of the study (RQ).

RQa: How is clinician anonymity created, enacted and sustained in a hospital context?

- What types of interactions produce anonymity?
- How do subjects talk about anonymity?

RQb: What are the implications of anonymity on hospital practice?

- What are the consequences of anonymity on inter-professional communication?
- What kinds of troubles, hitches, glitches, and problems does anonymity create for health care?

The dissertation is organized to address these questions as follows:

- Chapter 1, "Introduction and Background," (this chapter) presents the theoretical background of the two main bodies of work that influence the research: anonymity in communication and design science methodology.

- Chapter 2, "Methods," outlines how design science methodology drives decisions in the methods of data collection: Observations, Interviews, and Surveys.

- Chapter 3, "Design Thinking," characterizes the nature of inter-professional communication, and describes clinician anonymity along with the consequences and local strategies that create and sustain it. A working model of clinician anonymity is synthesized based on literature and existing frameworks. The chapter concludes by proposing key design requirements for developing an artifact and its associated practices for managing clinician anonymity in the hospital ward.

- Chapter 4, "Design Artifact," describes the materialization of design thinking into practice; it details the various iterations and evaluations that led to the creation of the Face2Name intervention.

- Chapter 5, "Design Process," discusses the benefits and challenges of employing design science methodology, i.e. the difficulty and importance of gaining access to the field, involving users in iterative design, and in the evaluation of artifacts.

- Chapter 6, "Conclusion," summarizes the findings and reiterates the contributions of this study.

Anonymity in Communication Research

"Despite long-standing disagreement over its merits and limitations, anonymity is particularly relevant to communication scholars." (Rains & Scott, 2007, p.62) This section begins with an account of the existing literature on the subject of anonymity as it relates to communication, which informs the conceptualization of the "clinician anonymity" phenomenon that is the focus of this dissertation. As such the characteristics that communication scholars use to define anonymity, the various types of anonymity and how anonymity relates to the notion of privacy, and some of the benefits and limitations associated with anonymous communication are outlined.

Although anonymity has been studied for over a century (Hopkins 1889, 1890; LeBon 1896), research on the topic is largely fragmented (Rains & Scott, 2007). With the exception of two noteworthy theoretical pieces (Scott 1998; Marx 1999), few extensive attempts have been made to identify the central features of anonymous communication (Rains & Scott, 2007). More recently anonymity has found a renewed sense of interest in communication research predominantly due to the rise of new information and communication technologies (ICTs). This has spawned a large number of studies on anonymity conducted in the context of mediated communication, with the central focus on the dichotomy that ICTs both afford users greater anonymity while simultaneously making their data more identifiable. At the same time, the problematic of the effects of face-to-face anonymity on individuals in the more traditional communication sense are not fully understood. Further, with the exception of studies looking at the impact of anonymity in group decision-making, journalism and whistle-blowing (Rains & Scott,

2007), little research has infiltrated other professional settings, such as the healthcare environment in general, and the hospital environment specifically.

Defining Anonymity

As Scott observes early in his work on anonymity, there needs to be a greater understanding of what anonymous communication entails, when and why it is used, and how it is accepted and rejected by receivers of anonymous messages (Scott 1998). Even within the communication scholarship, anonymity has several conceptualizations, and central to these distinctions is the notion that anonymity can be both objective and perceptual. *Technical anonymity* for example refers to the anonymity ostensibly offered by a feature of a technology, whereas *social anonymity* is the degree of anonymity that individuals perceive the technology actually affords. Scott (1998) suggests that "anonymity is usefully viewed as a perception of the communicators involved" because despite what some technology might afford, behavior depends far more on the extent to which communicators perceive anonymity. (p.387)

Johnson (1997) distinguishes between *offline anonymity*, under which he includes face-to-face, telephone, and traditional media, and *online anonymity* defined by that which occurs from using computer-based systems. With the explosion of new information technologies, this distinction is increasingly blurred as many telephone-type communication exchanges occur through what are now computer-based systems, either through applications such as Skype©, or through mobile smart phones, which are also computer-based. What remains distinct however, and perhaps serves as more accurate terms, are *in-person anonymity* versus *mediated anonymity*.

Looking from different perspectives, there can be *physical anonymity,* which occurs when one cannot see or is otherwise unaware that others are physically present, *self anonymity* which is a sender's perception that he or she is anonymous to others, and *other anonymity* that refers to a receiver's perception of a sender's anonymity (Scott 1998). Anonymity can fall along a discrete or a continuous spectrum. Sometimes it is considered to be a *discrete* construct (i.e. individuals are either fully identified or completely anonymous). For example, discursive anonymity involves not being able to identify the name of a particular source or to attribute a message to a particular source. At other times anonymity is considered to be *partial* such as when a fictitious alternative identity is used such as a pseudonym, an alias, a false, or an assumed identity.

Scholars concerned with anonymity place emphasis on the message source, not the message itself, and view the construct as a continuum across various dimensions. In his attempt at creating a model, Scott (1998) describes anonymity across two dimensions: *source specification* and *source knowledge*. Source specification refers to the extent to which a message source is distinguished from other possible sources. Source knowledge is concerned with the degree of familiarity between the source and the receiver; as such 'knowledge' represents a type of experience between the communicators. Marx (1999) furthers the concept of source knowledge by elaborating seven types of *identity knowledge*: 1) Legal name, 2) locatability, 3) pseudonyms that can be linked to a legal name and/or locatability –literally a form of pseudo-anonymity, 4) pseudonyms that cannot be linked to other forms of identity knowledge --- the equivalent of "real" anonymity, 5) pattern knowledge, 6) social categorization, and 7) symbols of eligibility/ non-eligibility.

Aspects of anonymity are also reported under the broader concept of "*familiarity*" which is often defined as "the amount of experience individuals have working with one another" (Huckman and Staats, 2013). The term 'familiar' suggests that the team members have developed some degree of rapport, and may also have developed some understanding of each other's backgrounds and relevant work experience.

While there are various conceptual and operational definitions of anonymity, Scott, Rains, and Haseki (2011) suggest the following definition as most relevant to the study of communication: "the degree to which the communicator perceives the sender to be unknown, specifically by a lack of familiarity and knowing one by name and/or sight." The above definition will be used throughout as a starting point in order to build upon what anonymity entails in the healthcare context.

Anonymity and Privacy

The concept of anonymity is related to that of *privacy* and it is important to highlight how one impacts and is impacted by the other. It would appear that privacy is more of a motive, goal, or value, while anonymity is more about performance or a means for achieving privacy. First, it should be noted that the literature on the conceptual analysis of privacy is far more extensive than that on anonymity. Some level of difficulty arises around the different meanings of the term 'privacy.' McLean (1995) writes that "definitions of privacy should distinguish privacy from related concepts with which it overlaps, such as solitude, secrecy, autonomy, liberty, and being let alone." (p.50)

In his detailed paper on the importance and value of protecting privacy of health information, Pritts (2008) describes anonymity as just one facet of privacy (alongside solitude, seclusion, and secrecy/ reserve). He defines anonymity as being in a group or in

public, but not having one's name or identity known to others; not being the subject of others' attention, which differs from being alone, having limited contact with others, and having information being withheld or inaccessible to others. In this sense, secrecy or reserve may also reflect what will be referred to here as "*intentional anonymity.*"

Some describe privacy as a state or sphere where others do not have access to a person, their information, or their identity; others focus on the ability of an individual to control who may have access to or intrude on that sphere. Alan Westin, for example, considered by some to be the "father" of contemporary privacy thought, defines privacy as "the claim of individuals, groups or institutions to determine for themselves when, how and to what extent information about them is communicated to others." In the context of personal information, concepts of privacy are closely intertwined with those of confidentiality and security.

Anonymity can be socially desirable for many reasons. Marx (1999) summarizes these situations as follows: when it facilitates the flow of information; to obtain personal information for research; to encourage attention to the content of the message; to encourage reporting, information seeking and self-help; to obtain a resource or encourage action involving illegality; to protect donors or those taking controversial but socially useful action; to protect strategic economic interests, to protect one's time, space and person; to aid in judgments based on specified criteria, to protect reputation and assets; to avoid persecution; to enhance rituals, games, play and celebrations; to encourage experimentation and risk-taking; to protect personhood; for traditional expectations; and more personal to the heart of academics (seeking blind peer-review) to aid in judgments on specific criteria (i.e. the quality of one's research and argument as opposed to their

relation to the editor). It is important to distinguish the fact that anonymity can be

intentional (as with the examples listed above) and have associated benefits, but that

anonymity can also be an unintentional performance or means that keep one private when

not desired, as described in the cases below.

Anonymity and Identifiability

Marx (1999) also mentions that in some contexts anonymity is present simply because

the conditions of complex urban life permit it – where he refers to walking on a crowded

street, or cheering in a stadium, this can be directly related to the fast-paced, frequently

rotating environment of a teaching hospital. However, many advantages of identifiability

often supersede the benefits provided by anonymity, as Marx (1999) points out in his

seminal work, highlighting the following reasoning.

Normative behavior is more likely to occur when people are identifiable, as such

identifiability can assist with accountability. Identifiability is also necessary as a means

of judging reputation. In small communities, membership itself can be a form of

vouching, but in large impersonal societies people must rely on names and their

associated records in order to share a common understanding of one's character, standing

etc. When interactions are mediated by time and space, identifiability becomes a form of

generalizable trust – for example when restaurants require that patrons leave an email or

phone number when making a reservation. Some forms of identifiability are necessary for

bureaucratic eligibility, for example being of age to drive, drink, or vote. Identifying

individuals may also serve as to protect the individuals, as is the case when donating

blood. Personal information can aid in social orientation; for example one's name may

provide insight into one's history. Reciprocity is another social norm that can only be

possible if people are able to identify those with whom they interact. Identifiability can also aid in efficiency and improve service by tying one's previous actions with future events or interests (much like ordering the same pizza as last time). A rationale that is of particular interest to researchers is the ability to collect identifying information in order to track variables longitudinally. Last, and perhaps most relevant to the argument of this study, is that fundamental to relationship building is the reciprocal revealing of personal information.

Literature addressing familiarity in several domains identified *trust* as a crucial aspect and one of the most often cited benefits of identifiability. It usually takes time for team members who haven't worked together before, to trust each other, and effectively coordinate their actions. Social network theory can help explain how familiarity builds trust. More specifically, the literature on closed networks finds that if trust and the reliability of information are important, closure can provide a greater advantage to individuals (Burt, 2001). The key concept is that a network in which everyone is connected such that no one can escape the notice of others, facilitates sanctions that make it less risky for people in the network to trust one another (Coleman, 1988). Through transitive properties, strong relations give more reliable communication channels, make trust more likely between unconnected nodes, and protect actors from exploitation as contacts are more able to act in concert against a node that violates their norms of conduct.

Anonymity and Familiarity in Team Performance

There are a number of studies across various fields that show the manner in which familiarity is beneficial to performance. Richard Hackman studied flight crews and found

that teams, like individuals, experience a learning curve around effective group work (McCluskey, 1997). They generally do better on task completion and minimization of errors as their members become more familiar with one another. In the field of aviation research showed that 73% of incidents occur the first day a crew flies together. Studies run by NASA found that crew familiarity affects performance more so than fatigue (Foushee et al., 1986) i.e. tired but familiar crews make about half the amount of errors than crews that are well rested, but unfamiliar (Huckman & Staats, 2013). Huckman and Staats (2009) also mention a study conducted at a software firm that showed a 19% decrease in defects and 30% decrease in deviations from budget when team familiarity increased. They also found that member familiarity among consulting teams yielded a 10% improvement of client-perceived performance. The value of familiarity can also be inferred from the attempt to keep special operations team, such as Navy Seals, intact over years. In a study comparing familiar to unfamiliar incident management teams (IMT) deployed by Fire agencies, Peter Hayes (2013) found that familiar teams attended to more events more effectively, produced higher quality reports, made timelier decisions, developed greater situational awareness, and showed greater intra-team trust, satisfaction and teamwork. Other researchers have looked at how the performance of pro basketball teams vary according to how long players have been together and found that familiarity reduces bad passes between players (Huckman & Staats, 2013).

Also within healthcare, team familiarity has been found to play a critical role in collaboration in the operating room. Huckman and Staats (2013) write about a legendary orthopedic surgeon who in a typical year out-performs the second most productive surgeon by 2.5 times, and has fewer complications and better patient outcomes. This

surgeon attributes his speed to working alongside two dedicated teams of the same nurses for 18 years. Working with the same people allows team members to gain mutual experience and to develop routines. Over time this shared experience allows teams to perform better under pressure when operations become more difficult, thereby enabling them to better react to unexpected surgical problems (Kurmann et al., 2014). In other words, identifiability contributes to familiarity, which in turn fosters effectiveness.

One randomized controlled trial (RCT) conducted in 2007 across four Canadian hospitals attempted to address the problem of the lack of familiarity among inter-professional staff by introducing a verbal, clinician-led intervention. In this study it was suggested that staff have an 'introductory script' every time they begin to communicate with one another, in which they have to say hello, state their name, state their role, state the intent of their communication etc. This 'script intervention' was designed to improve inter-professional collaboration by increasing clinician familiarity and resulted in a relative improvement on specified outcome measures (Reeves et al., 2007; Lingard et al., 2007). However, perhaps due to the fabricated nature of the intervention, which required an unrealistic investment on the part of clinicians to maintain it, its sustainability was limited to the research phase.

Huckman and Staats (2013) argue that familiar teams perform better due to five main factors. First, they coordinate activities better; learning when and how to communicate is a process that takes time, but once individuals learn, they can carry these skills over to the next project. Second, familiar teams know where the knowledge lies; over time, they learn which individual has which skill set. Third, they are better at responding to change, as in a time of stress familiarity provides a common platform from

which the group can feel comfortable being flexible. Forth, familiar teams are better at integrating knowledge in order to innovate, as members are more likely to share information with those they trust. Finally, from a business-oriented perspective, familiar teams are better at capturing value because they build competitive advantage when they create capabilities their competitors cannot replicate.

Clinician Anonymity

'Clinician anonymity' is proposed here as an entirely different and novel way of looking at the problem of anonymity in hospitals. 'Clinician anonymity' in the current research refers to the inability of healthcare staff (doctors, nurses, allied health members) to identify other healthcare staff by various characteristics, such as sight, role, association or name. Here, anonymity is defined as a property of a relationship among people evident in identifier practices. Anonymity is an achievement, not a characteristic of individuals – identifiers are characteristics of individuals. There is some degree of anonymity that is functional before it becomes dysfunctional. By defining anonymity as a relational property it also illustrates that anonymity is nested in organizational rules, technical systems and norms and practices of a group.

Despite its potential negative consequences on healthcare quality, clinician anonymity is greatly overshadowed by the preoccupation with privacy issues in healthcare. In general, hospitals are concerned with "technological anonymity" which as defined above, refers to features of technology related to the privacy and security of patient data. It encompasses aspects of discursive, self, and other anonymity, and is a byproduct of organizational rules and processes, as well as of dynamic medical environments. To date, there is very little research that looks at the phenomenon of

clinician anonymity and the studies that touch on this subject do not have anonymity as the focus of their analysis.

Conceptualizing Clinician Anonymity

The following describes a refinement of the concept of anonymity in healthcare: The most basic form of clinician anonymity is the inability to recognize the person one works and collaborates with as part of a patient's care team; that is, when staff cannot identify a colleague by sight (physical anonymity). The next level of clinician anonymity refers to not knowing the profession, roles and responsibilities of a colleague, or not being able to distinguish between the mandates of different clinicians: when a staff member is unaware of another member's role; what aspects of healthcare each staff is responsible for within the team; which information they have access to and when do they have to be involved in a patient's treatment course; or how is this person's role different from the others. The point is well captured in a comment made during an interview by a medical student who has been on rotation on the General Internal Medicine (GIM) ward for at least three weeks, and was referring to clinicians' understanding of the different staff roles and responsibilities.

> *"But between PT and OT there are still some blurred lines and even between OT and social work there are some blurred lines… it would be really helpful if I knew more about the roles and responsibilities because then we would know I'm talking to the right person about the right thing"* [I.06.03.2014.MedicalStudent]

Not knowing or not remembering a person's name represents discursive anonymity. The importance of knowing and addressing colleagues by their names cannot be

overemphasized, as revealed by an attending physician who participated in the study explains:

> *"I'm a big believer in first names so I refer to all the members of my team and the allied health team by first name. Which I think is really important, because I know, my wife is an allied health member and she hates being called SLP when she's worked with someone for three months. She's like I'm not SLP, I have a name, I am a person. So I think it's very important to try and encourage those relationships..."* [I.10.02.2014.AttendingPhysician]

These quotes from clinicians illustrate several key concepts about identifiers, familiarity, and trust, discussed in the literature, but further highlights that anonymity is relational and subject to shared practices of identifying and shared values about communication and commitments to trust and familiarity among the clinical team.

Finally, another important clinician "identity" dimension is their association with a group or unit, and their assignment to certain patients: their belonging to certain professional groups (e.g. medical, nursing or allied health), inclusion into specific teams ('teaching team 1, 2...' or 'hospitalist' medical team, etc.), and their primary assignment to individual patients (e.g. designated as "most responsible physician", or MRP).

> *"So initially it was kind of confusing because I know all these allied health people's names but I can never figure out what team they belong to so initially I was always talking to the wrong person. Then with the residents and the physicians it's even more confusing because they rotate, right?"*
> [I.20.02.2014.CCAC]

The allied health member is highlighting many different but related problems in getting the practice of identifying right. A person's sight, role and responsibilities, name, and associations within the hospital context, are aspects about members of the clinical team that, when unknown, represent manifestations of "clinician anonymity". It is important to realize that each of these aspects has specific implications in the design of an intervention to address the problem of clinician anonymity.

To summarize, anonymity is achieved among two or more people through the manipulation of identifiers. Anonymity is a state or characteristic of a relationship among people and there are a wide range of identifiers, the most obvious are names, pseudonyms, aliases etc. Anonymity can occur in various states among two or more people depending on the identifiers used or not used. When two or more people interact together over time in an identifiable way they become familiar with each other. Thus, anonymity is reduced through uses of particular kinds of identifiers and through familiarity.

The differing states and qualities of anonymity have positive and negative consequences in daily practice depending on the context and situation. For example, anonymity can be a means for securing privacy. However, privacy through anonymity can mitigate familiarity. For groups that need to work together there is a need for managing the degree of anonymity of the members so as to optimize familiarity necessary for coordination and collaboration.

In terms of hospitals, there is a culture of privacy that has engendered identification practices promoting 'clinician anonymity' in ways that undermine the needed familiarity for group coordination and collaboration among clinicians. Anonymity

is constructed through practices, so at least in principle it can be redesigned in order for people to achieve a new kind of relationship with each other.

Design Science

This section reviews design science and why it is appropriate for the study of communication phenomena. Design is a way of generating knowledge that can have immediate practical benefit while opening up the search for scientific truths. Moreover, a design approach seeks to develop working solutions while discovering what can be generalized and applied to other similar contexts.

Peffers et al. (2008) argue that design science is concerned with the act of creating an explicitly applicable solution to a problem through synthesis. This is an accepted methodology in disciplines such as engineering, computer science, and in the design of communication technologies. Yet it still does not have a strong hold in fields like organizational behavior, management, or communication (von Alan et al., 2004; Avital, et al., 2006; Dunbar & Starbuck, 2006; Jackson & Aakhus, 2014; Jelinek, Romme, & Boland, 2008). A design science approach differs from conventional research in language and interaction through its concern for what is possible, focus on pragmatics and context, and production of both a theoretical and practical output (Aakhus & Jackson, 2005). Three principles of design science; context specificity, iterativeness, and user-centeredness, have proven critical to the successful design and diffusion of interventions (Brown, 1992; Stolterman, 2008). Involving multiple stakeholders in meaningful ways results in solutions that are feasible for the real environment, but it also means gaining active participation and effective endorsement in early phases of intervention creation (Schön and Rein, 1994). Interestingly, healthcare industry innovators such as Kaiser

Permanente, the Mayo Clinic, and the Cleveland Clinic, are all investing in design as an approach to improve healthcare experience (Ferguson, 2012).

Distinction between Design Science and other Research Paradigms

Craig (1989) challenges conventional views about science that undermine understanding practice in communication research. Attention to design addresses this gap in the conventional way communication research is conceptualized and conducted and offers an alternative to the often dichotomized scientific and humanistic traditions (Jackson & Aakhus, 2014). Jackson & Aakhus (2014) further clarify that "the design approach to understanding the world is distinct from science and art, and is best described by the differences and convergence of three attributes: the true, the ideal, and the real" (p.126). Traditional science seeks to describe the truth, to understand reality (Baskerville & Pries-Heje, 2010), and thus explain the world as it is. In contrast to this kind of empirical work that deliberately avoids making value judgments, critical theory advances normative arguments (how things ought to be) and evaluations of current practice. A design stance differs from an empirical or normative stance while remaining complementary to those stances (Aakhus, 2015). It makes sense of the world in a third, unique way: by seeking the realization of an idea while simultaneously taking into account what is true. Design science strives to realize things that are desired but not yet real (Aakhus & Jackson, 2014). As Jackson and Aakhus (2014) explain "design work entails disciplined, reflective discovery, and development of concepts for seeing what is possible and methods for realizing what is possible" (p.127). Herbert Simons' influential book, *Sciences of the Artificial*, has helped in realizing the uniqueness and importance of

this type of research. He makes a clear distinction between "natural science" and "science of the artificial" (also known as design science):

> A natural science is a body of knowledge about some class of things – objects or phenomena – in the world (nature or society) that describes and explains how they behave and interact with each other. A science of the artificial, on the other hand, is a body of knowledge about artificial (man-made) objects and phenomena designed to meet certain desired goals. (Simon, 1996, p.1)

Characteristics of Design Science Methodology

A fundamental aspect of design methodology is building a procedural framework and corresponding design tools (Aakhus 2014). By attempting to create useful things, a great deal is learned about the nature of communication (Aakhus & Jackson, 2005). Thus, design work can yield insight even by failing, and by this improve our knowledge of how to design (Harrison, 2014). The methodology of design finds ways to discover and incorporate what is learned from the surprises and failures of inventions and interventions into design-thinking, design processes, and design artifacts. In a classic statement on design, Simon (1996) maintains that man-made artifacts are created for the purpose of transforming the given into the preferred.

Simon (1996) further frames sciences of the artificial in terms of an inner environment, and outer environment, and the interface between the two that meets certain desired goals. The bringing-to-be of an artifact through *design activity* is constrained by both its inner organization and its outer environment. The inner organization of design artifacts is "structurally coupled", or mapped to its environments, much like biological entities are (Vaishnavi & Kuechler, 2007). In his famous analogy Simon describes the

complex patterns created by an ant as it zig-zags along a beach. One might mistake this ant as complex due to the way it moves, but the reality is that the ant itself is a simple organism and functions on a minimal set of rules (takes whatever path it needs to get back to its nest). It is the environment (the existence of obstacles, like leaves and shells) in which the ant travels that creates the complexity. With this analogy, Simon illustrates the interaction between environment and perceived complexity. Just because we see complex patterns does not necessarily mean that what we are trying to understand is overly complex or can't be understood with a rather simple set of principles.

Design science scholars believe that behavior is highly dependent on context, and therefore that research is better served "outside," in the real environment, among the many uncontrollable variables (Baskerville, 2013). Other research disciplines also place importance on the impact context has on outcomes. For example, through 'Formative evaluation', researchers are tasked with studying the complexity of implementation, and suggest ways to answer questions about context (Stetler, 2006). Researchers conduct rigorous assessments designed to identify potential and actual influences on the progress of implementation efforts. It is a measurement approach capable of providing critical information about the implementation of research findings into practice (Stetler, 2006), something that is sorely needed in the healthcare space.

"Design in communication is a ubiquitous phenomenon, which is most evident in human uses of language and interaction that intend to achieve or avoid particular purposes, qualities of relating, and ways of knowing" (Aakhus, 2015, p.1). Communication design can also represent commonly shared practices, or specialized, expert practices. For instance, dispute mediators may employ a particular negotiation

tactic over another in order to get two individuals to agree on a contract (Jacobs &

Aakhus, 2002); public health officials might create professional roles in order to reach

out and educate particular cultural audiences (Ginossar & Nelson, 2010); the school

board might translate adolescent narratives about substance use experiences into a

substance abuse prevention curriculum for middle school students (Hecht & Miller-Day,

2007).

Design science has the power to bolster the study of communication for a number

of reasons: research questions in this field are by nature complex and grounded in

multiple disciplines, questions may have a sparse theoretical background, and phenomena

tend to be highly contextually dependent. Design is engaged with creating useful things

(Aakhus, 2007) that serve human purposes (Baskerville & Pries-Heje, 2010). For

research this means conducting studies with some desired outcome that serves a goal for

an end user. In this respect, design theorists share pragmatists' understanding of success

(or evidence). Communication scholars will design an artifact with the expectation that it

will affect change in the relation, communication, or interaction between individuals. As

Jackson and Aakhus (2014) neatly convey in the recent special issue of the Journal of

Applied Communication: "Design science is theoretical work with a practical interest, or

practical work with a theoretical interest" (p. 127). The theoretical element is evident in

the reasoning that underwrites the actions taken to achieve a kind of communication

(Aakhus, 2007; 2015). Theory thus figures in communication design practice in a manner

discussed by Craig (1999) around the idea of practical theory: practices reveal theories in

action. Design methodology therefore involves developing the grounds for two basic

kinds of claims: (1) claims that are predictive in the sense that an intervention or

invention will realize a particular form and quality of communication; and (2) claims that are explanatory in the sense that an adequate account can be developed about how and why a particular invention or intervention works as it does.

Design science approach appears ideal for the study of clinician anonymity and for designing practical solutions to alleviate its negative effects on communication, clinical effectiveness, and patient experience. Because the solution is entirely dependent on context (the hospital, hospital staff, and hospital workflow) a user-centered design strategy is required in order to create successful and sustainable artifacts.

CHAPTER TWO: METHODOLOGY & METHODS

Healthcare is currently characterized as "more to do, more to know and more people involved than ever before." (Baker, 2001) Due to the complexity and frequent rotation of the care team members, clinicians in teaching hospitals have to work together with many different physicians, nurses, and other allied health professionals such as occupational therapists. This study was in response to the concern voiced by the hospital's management regarding poor inter-professional communication and its consequences on staff satisfaction, patient safety and quality of care. The inability to identify hospital staff was originally reported by patients as a factor negatively influencing patient satisfaction with their hospital stay, and poor understanding of the discharge plan. Results from a previously administered patient questionnaire led to the design of the Face2Name Part A study, a randomized controlled trial registered with ClinicalTrials.gov (NCT01658644), which evaluated the impact of patient recall and communication with their health care providers for inpatients given photographs of their clinicians compared with patients following the current standard of care. The intervention used in part A was a paper handout that displayed the photos, names, and roles of staff organized by patients' clinical care teams. Throughout the trial, many staff members approached the research team and indicated that they themselves did not know or could not recognize their colleagues, and asked to receive the 'patient' handout, which displayed photos, names and roles of staff.

Consequently, an indirect outcome of the Face2Name part A study emphasized the problem of clinician anonymity pointing out the extent to which members of the staff of different professions working in the General Internal Medicine (GIM) department

were not familiar with each other: they were not able to identify colleagues by sight, to remember their names, to know their professions and roles, or the clinical team to which they belonged to. It was hypothesized that this had negative impact on communication and collaboration and introduced inefficiencies and ineffectiveness in the daily workflow.

Face2Name Part A showed that clinician anonymity stretched beyond the difficulties faced by patients, and (anecdotally) revealed that the phenomenon was also affecting clinicians. Using design science principles, the current study was devised to characterize in greater detail the causes, manifestations and consequences of clinician anonymity and to create an artifact to address the negative impacts of clinician anonymity on inter-professional communication and staff satisfaction.

The benefits afforded by conducting mixed methods studies, triangulation, complementarity, development, initiation, and expansion (Greene, Caracelli, & Graham, 1989), are widely recognized. Triangulation refers to the application and combination of several research methods to overcome the weakness or intrinsic biases and the problems that come from single method. Through triangulation, mixed methods can bring greater validity by corroborating results across different methods. By mixing quantitative and qualitative methods researchers are able to offset the weaknesses and draw on the strengths of each. For example, interviews and surveys alone are subject to self-report biases; participant observation on the other hand could serve to confirm individual reports on the state of communication and anonymity.

Complementarity refers to the characteristic that one method can bolster another by seeking elaboration, enhancement, illustration, and clarification of the results from one method with the results from the other method. For example, while observations can

result in the representation of communication networks, variables such as trust cannot be easily observed, but can be inferred by asking participants through a survey to list who they trust.

Development refers to the use of results from one method to help develop or inform another method, where development is broadly construed to include sampling and implementation, as well as measurement decisions. In the case of this study, observations served to inform the design of interview questions, and a subset of the interview questions, that proved efficient in gathering accurate responses, were selected for inclusion in the survey tool, which was disseminated to a larger audience.

Mixed methods were appropriate for this study as design research itself seeks to create things efficiently and legitimately. Researchers can adjust certain methods based on findings from previous methods, resulting in data collection tools that are better focused on answering the research question (legitimacy) and do so efficiently; rather than collecting all the data, analyzing, and then determining it is incomplete or inadequate, researchers can improve the tools incrementally throughout the study. From a "method as argument" stance, mixed methods serve the point of developing defensible empirical claims (Jackson, 1989). For example, it makes sense to collect both objective and subjective data when the phenomenon under study is impacted by perception. One could argue that observations cannot answer how clinicians feel about anonymity or how they perceive it; whereas interviews may not justly describe "what is," in other words reveal the true existence of clinician anonymity. Moreover, both these methods afforded the researcher the ability to see what the artifact *is* and listen to how it *ought to work* so that appropriate adjustments can be introduced iteratively in order to achieve the design goal.

Design science methodology does not explicitly encourage the use of any data collection method over another but in order to satisfy some of the principles of design science (e.g. user-centeredness) some methods appear inherently more appropriate. The methods employed in this research are no different than those used in more traditional studies, namely participant observation and case study research. The distinction lies with the end goal of the research; in design science this is the creation of an artifact that addresses the issue under study.

The remainder of this chapter introduces the study 'setting', provides a brief study design and timeline, and recounts in greater detail the various data collection methods used (observations, interviews, surveys), the number of study participants, and the data analysis methods.

Setting

The study was conducted within two General Internal Medicine (GIM) wards at the Toronto General Hospital (TGH) - a large teaching hospital in Toronto, Canada. The patients in these wards are adults suffering from acute illnesses and who receive (nonsurgical) treatment. Patients are referred to GIM from the emergency department or other hospital wards; there are no elective admissions. The hospital's two GIM wards are located on the 13th and 14th floors, although patients are commonly "bed-spaced" to other wards when the 13th and 14th floor wards are full. The division is composed of between 200 and 300 staff and students throughout one academic year with four medical teams referred to as 'clinical teaching units' (CTUs) serving goals related to patient care, education, collegiality, and administration. The CTUs have up to nine team members:

one staff physician, one senior medical resident who is a second- or third-year post-licensure medical resident (PGY2 pr PGY3), two or three first-year medical residents (PGY1), one or two pre-licensure medical student in the fourth year of medical school (fourth-year clinical clerk or CC4), and up to three pre-licensure medical students in the third year of medical school (third-year clinical clerks or CC3). Medical teams work with groups of non-physician health professionals known as 'allied health' members. These include pharmacists (Pharm), social workers (SW), physiotherapists (PT), occupational therapists (OT), speech language pathologists (SLP), dietitians (Diet), spiritual care advisors, and community care access center members (CCAC) [see appendix A for a description of each of the roles as defined by the GIM clinical management]. Generally one member of each allied health profession is assigned to each medical team, but sometimes they cover two teams. The CTUs together with their assigned allied health members make up a 'clinical team'. These clinical teams visit patients located on the 13th and 14th floors. In addition to the clinical teams, nursing staff care for patients; unlike the clinical teams, nurses are organized based on the floor where they are located; i.e. a nurse will serve patients only on the floor he/she is assigned to (either 13th or 14th floor). The nurses' work time is divided into two shifts (7:00am-7:00pm and 7:00pm-7:00am). Figure 1 shows the composition of the different teams around patient care. Figure 2 depicts the assignment of staff to teams and patients.
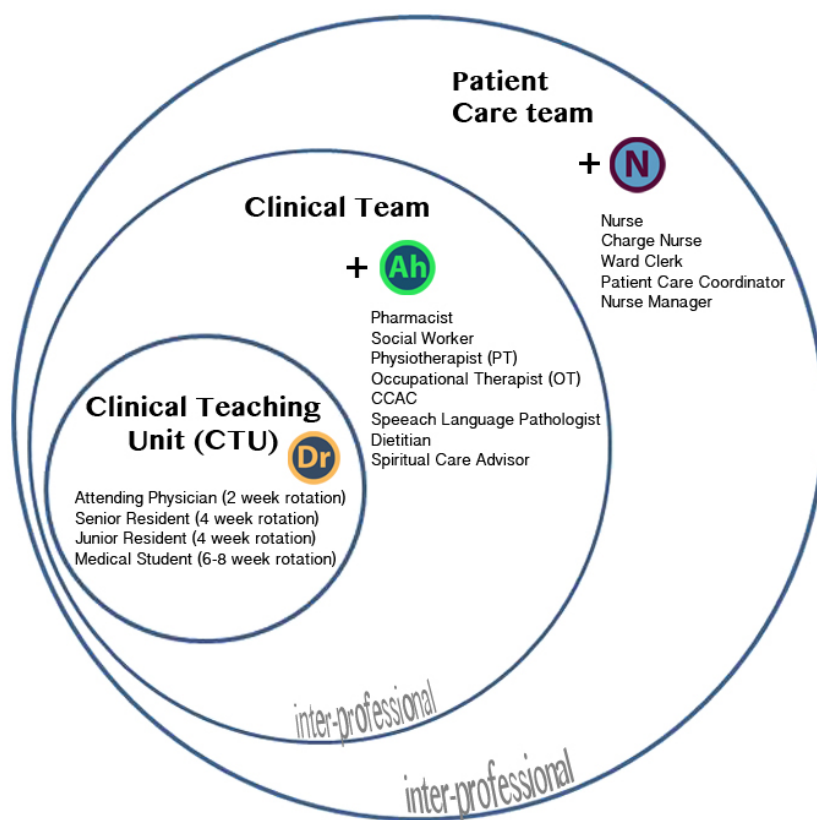
Figure 1: Composition of Different Teams Around Patient Care
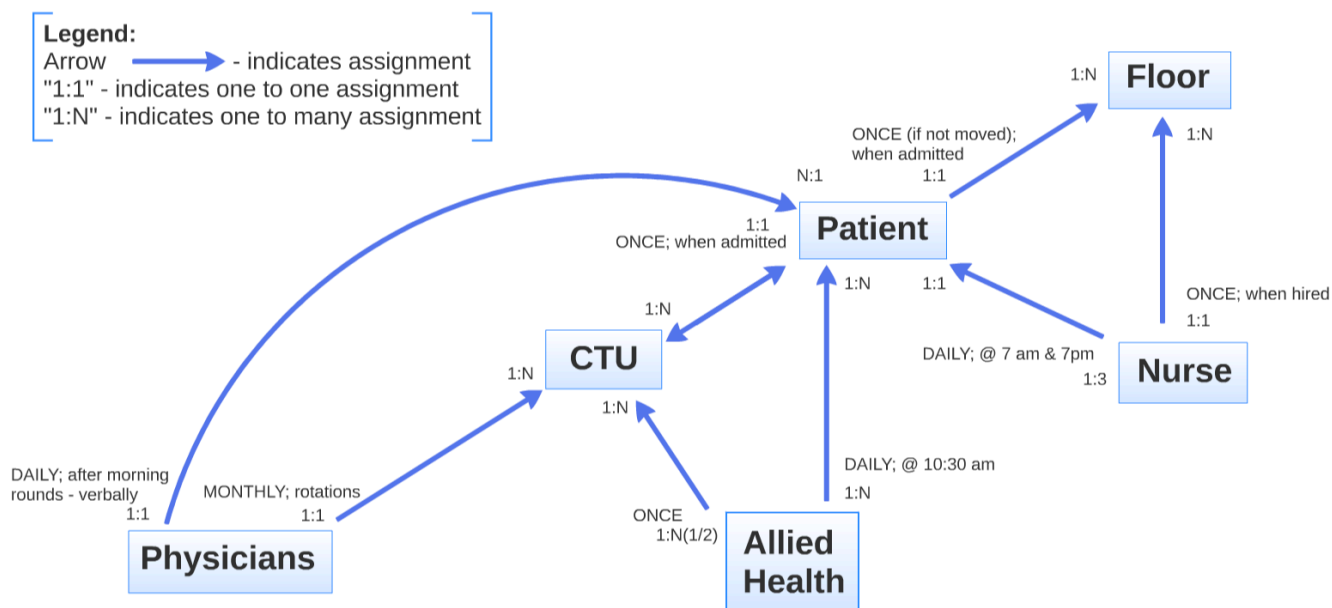
Figure 2: Basic Assignment of Staff to Teams and Patients

Study Design

This was a non-randomized, open, longitudinal and in part a cohort study, using sequential mixed methods designed to collect pre- and post-intervention data. It consisted of qualitative methods: (1) Participant observations and (2) semi-structured interviews, and quantitative methods and (3) surveys. Most of the study characteristics were determined based on feasibility of conducting research in the real hospital environment, without obstructing workflow. For example, the study was open (non-concealed) because it would be unethical to impersonate a clinical professional. One of the goals of a design study is that part of the output will be the design. Each section below describes an important aspect of the study design and provides a rationale as to how it helps address the research questions.

Timing

Participant recruitment and data collection occurred during eight-months and were organized around the medical staffing "Blocks". These blocks are four-week periods that align with medical residents and clinical students' 'rotations' on the hospital inpatient units hence every full year has 13- 4 week blocks to make up the 52 week year. Approximately every four weeks (one block) a new group of medical residents start working (rotate) on the medical teams; these rotations serve to provide residents experience with different medical specialties. The bulk of observational and interview collection data was conducted during the six months pre-intervention. Over the course of the last two blocks (approximately 2 months), surveys were administered at four points in time: on the first three and last three days of each block. These longitudinal data points

served to determine pre-and post- intervention efficacy. Figure 3 displays the project

timeline.
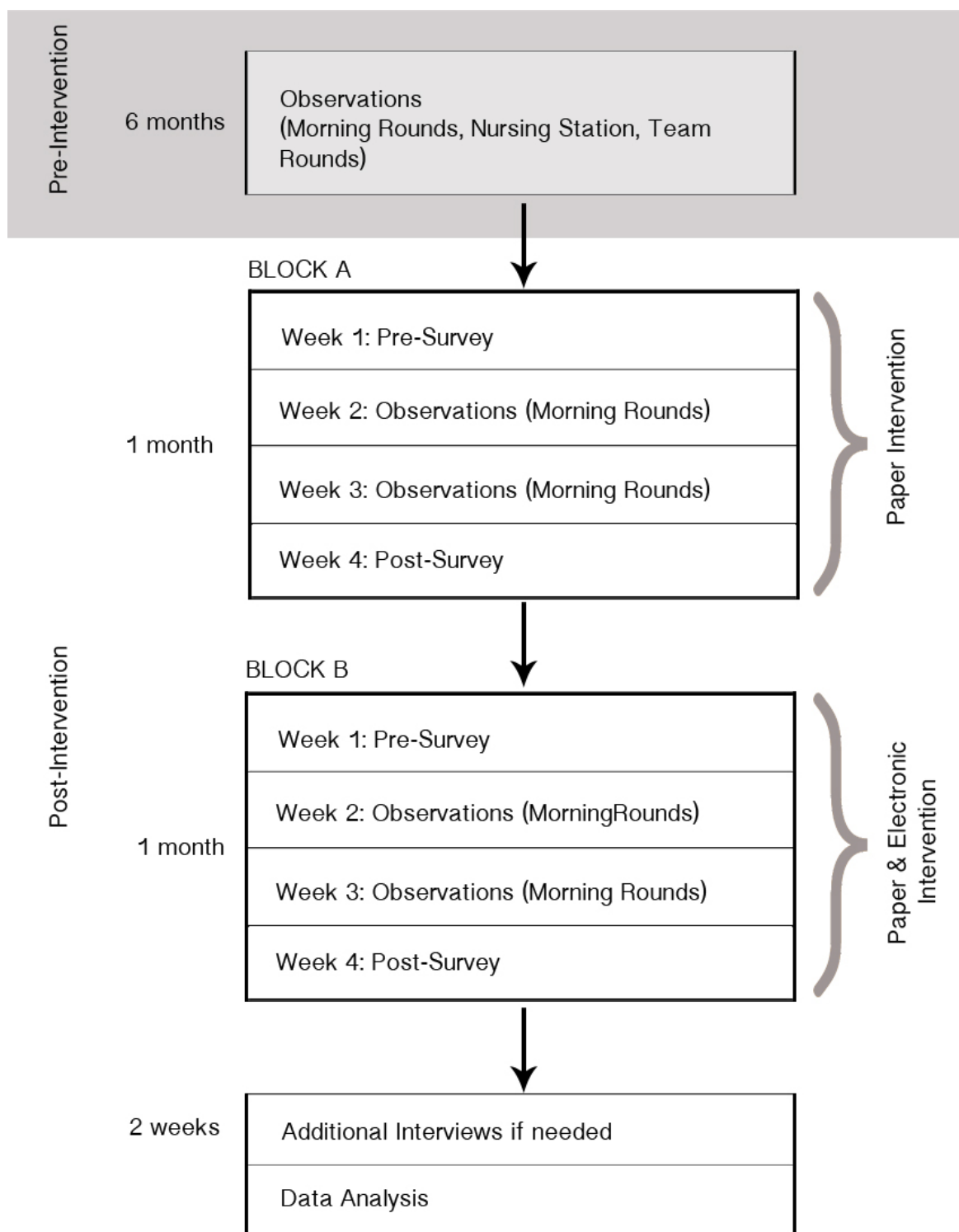
Figure 3: Timeline of Research Methods

Participants

All staff working on the GIM wards at TGH were eligible for inclusion. Survey and interview inclusion criteria consisted of the ability for participants to provide informed consent. An effort was made to equally sample a representative range of professions (e.g., allied health professions, staff physicians, registered nurses, medical residents, and medical students) from each of the clinical teams and two nursing floors.

Data Collection and Analysis

The research began with observations, which, followed grounded theory principles. Interview scripts were informed by a review of the literature regarding inter-professional communication and teamwork in hospitals. Surveys were informed by previous interviews as well as literature review.

Observations

Observations were conducted on the ward and during inter-professional meetings, in order to gain an understanding of the hospital environment and how clinician anonymity manifests. Observations served to address the secondary research questions: how is clinician anonymity created, enacted, sustained, and what are the implications of anonymity on hospital practice.

Observations collected descriptive and reflective data on verbal and non-verbal inter-professional interactions, focusing on capturing anonymity behavior. Descriptive observation notes reported as closely as possible conversations and sequences of actions and events, whereas the reflective notes recorded the researchers' interpretations of the observed interactions. Field notes were hand written so as not to draw attention to the

researchers or distract staff being observed. The notes were electronically transcribed and coded.

The goal of the observations was to understand how inter-professional communication is achieved in the hospital and identify instances of clinician anonymity, and how this may impact clinician communication, teamwork performance, and workflow. Another important objective of the observations was to maintain constant presence on the ward in order to build relationships between the research team and staff, so that staff would feel comfortable sharing their opinions and advice during the study. Observations occurred at various locations and different times of day, and involved representatives from each of the professional roles, in order to cover the spectrum of communication contexts, from the formal, institutionally required meetings, to the more informal and casual interactions. Formal meetings for example included daily "Morning/ Bullet rounds" where both the medical team, and allied health members are expected to run through each of their patients and provide comments within a span of 15 minutes. Other formal meetings, like nursing 'team meetings', were observed where for example the nurses would gather without the medical team, or, the CTUs team meetings - without the nurses. Moving towards the informal, observations were also conducted at the nursing station where all staff would interact on a haphazard manner, as well as through the discharge process, where a researcher would shadow a staff member as they prepared the documentation necessary to discharge a patient from the hospital (this process often requires many different staff members to 'sign off' therefore it is an opportunity for inter-professional interaction). Figure 5 and Figure 6 illustrate where in the environment

(Morning rounds and Nursing station respectively) the researchers sat and unobtrusively observed.
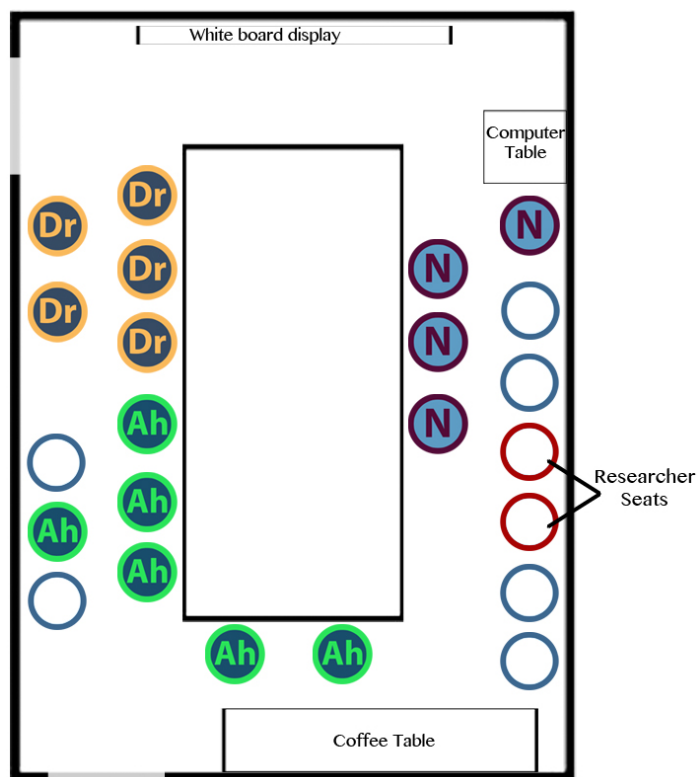
Figure 4: Morning bullet rounds, seating arrangement
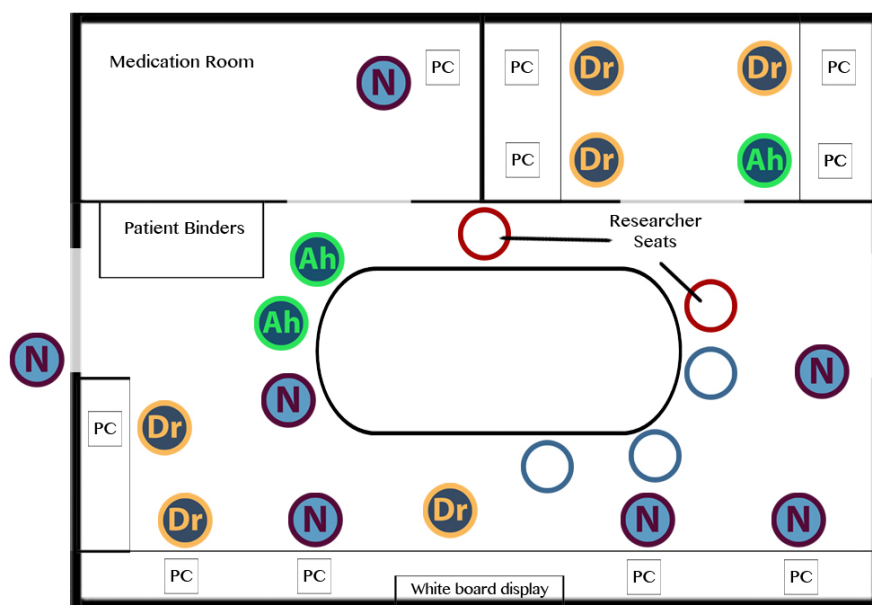
Figure 5: Nursing Station, Seating Arrangement

Field notes were transcribed and imported into NVivo (QRS international) for inductive analysis. Transcripts were read iteratively, broken down into utterances and were first classified by professional association (i.e. the role of the person who spoke, the team/ floor they were assigned to), then for the nature of communicative interaction (e.g. was the utterance a 'collaborative consult'), and finally analyzed for emergent themes. The coding scheme was collaboratively designed by the research team in an effort to create as few categories in which utterances could be exclusively coded. See Appendix B for a diagram of the initial coding structure (the yellow categories highlight the professional association codes), and Appendix C for a more detailed description of each category in the coding structure.

Both open coding (identification of primary themes) and axial coding (analysis of relationships among themes) were undertaken. Emergent themes were revised and refined through the constant comparison of instances from the data set. The research team was unaware of the level of difficulty or the richness of the data representative of anonymity. , Thus their initial focus when observing was to document instances of anonymity, how they may impact communication and teamwork, and capture various workarounds employed by staff to overcome such issues. In addition, because data was collected longitudinally, the researchers analyzed the frequency of instances of anonymity and communication events, over time. This way the data informed if and how hospital staff anonymity changed as individuals got to know one another, and whether or not this had an impact on their communication and interaction behaviors.

Interviews

The intent of the interview was to facilitate an in-depth understanding of the process of inter-professional socialization and communication, specifically the impact of anonymity on communication and collaboration. Interviews served to provide greater understanding of the perception of anonymous interactions, its implications, and consequences. They provided subjective accounts and also served to triangulate phenomena identified during observations.

Interviews were semi-structured and divided into three clusters, broadly: (1) How staff get to know one another, (2) suggestions for an intervention effective at reducing anonymity, (3) attitudes toward a tool that uses visual aids. The interview script was initially derived from existing literature and observations on inter-professional communication and then customized to allow the researcher to follow up on spontaneous participant comments during the interview. See Appendix D for the interview script.

Earlier interviews served to inform subsequent interviews (Small, 2009), and this allowed the researcher to adapt the interview script to probe and focus on issues raised and deemed important by participants interviewed earlier, providing an increasingly accurate understanding of the question at hand.

Interviews were audio recoded, electronically transcribed, and imported into NVivo (QRS international) for analysis. Initially, transcripts were coded based on interview question, to be able to determine if responses were prompted by the researcher, or if utterances were initiated by the interviewee, then they were coded by professional role. Transcripts were read and inductively coded based on themes and emerging

narratives. Narratives were meant to identify participants' perceived reasons for anonymity and the various impacts it may have on inter-professional communication.

Surveys

The surveys directly addressed the primary research question: how the intervention influences the phenomenon of clinician anonymity; which interventions are more impactful, sustainable, and perceived as successful, and why. Data gathered from the interviews and observations were used in concert with a validated survey (Bruyère Continuing Care, 2008) to design an amended questionnaire that was administered at the beginning and at the end of a 4-week block, with the goal of quantitatively evaluating clinician anonymity, inter-professional teamwork, and measuring the impact of the intervention. A quasi-experiment (no random assignment) tested pre versus post intervention, the degree of staff recall of their colleagues' names, faces, and roles, as well as their perception of intra- and inter-professional communication and teamwork. Recall was tested through a survey instrument administered to staff at two points in time: 1) during the first and 2) during the last week of a four-week rotation ('block'). During these days the research team approached staff who was at the nursing station and asked them to complete the survey either on an iPad or on a hospital desktop (via a link to Qualtrics). Staff completed at most one survey each point-in-time, and received a five-dollar honorarium to a coffee house of their choice.

Throughout the study, all staff had access to photos of *half* of the GIM staff members, half of the medical teams (CTUs) and their associated allied health members, as well as half of the nurses. The remaining two teams and nurses (whose photos were not provided) acted as the "control" group. In this way, the experiment tested whether the

dependent variable (recall of staff, quality of communication and teamwork) was correlated to the independent variable (the availability of staff photos).

Staff photos were provided in two ways: 1) paper based and 2) electronically. The paper-based handouts with photos were made available to all GIM staff. These handouts were secured to the walls in common areas (nursing station) as well as given to individuals. Photos of staff were also accessible electronically via a mobile web-based application integrated with the hospital's existing communication tool.

The survey had five basic sections: (i) demographic questions, (ii) questions testing participants' recall of the faces, names, and roles of their inter-professional colleagues (iii) questions assessing inter-professional teamwork and finally, (iv) questions pertaining to the usefulness of photos, (v) questions comparing the various interventions. The Bruyère team self-assessment scale consists of two parts: Part 1 (questions 1-23) evaluates a clinical team's perception of key team characteristics known to enable inter-professional care, a subjective evaluation, and Part 2 (question 24-32) evaluating the level of actual team practices associated with inter-professional care delivery model (IPC), which is an objective evaluation.

This link (https://rutgers.qualtrics.com/SE/?SID=SV_3fT57nzaKTq740t) provides access to the pre- and post-surveys, which are dynamic based on the role of the participant completing them. Because they are dynamic, it would be unreasonable to provide every possible version of the survey, see Appendix E for an example of post-survey questions provided to a senior resident (a version of the survey that has the most amount of questions posed; however does not include photos of staff in order to maintain confidentiality of participants).

Sample size

Interviews. Researchers interviewed a purposive sample of 14 GIM staff from a full range of professions (i.e. one attending physician, one senior resident, two junior residents, one international fellow, one medical student, one social worker, one occupational therapist, one CCAC, one PCC, one spiritual care advisor, and three nurses). This sample represents the average size and configuration of GIM teams assigned to a patient, including nurses.

Surveys. As research of this nature has not yet been conducted, there was no good estimate of effect size based on past studies. Therefore the power estimates based on Cohen's rule of thumb for effect sizes (0.2 = small, 0.5 = medium, and 0.8 = large) were used resulting in a moderate effect size of 64 people per group (128 surveys per cycle). Although this (medium effect) sample size estimate is not the most conservative, it was the one most feasible given the time constrains and financial restrictions. The research team approached all staff (eligible GIM team members) working on the block rotation for survey participation. A response that of 70% was the desired minimum to be achieved from the eligible GIM team whereas an ideal 95% rate was actually achieved. Twenty-five percent of surveys were completed by medical team members, 25% were completed by allied health members, and 50% of surveys were completed by nurses; this sample represents the correct proportion of different professional groups in GIM.

Research Team

The research team consisted of two members, the principle investigator (PI), and a research assistant (RA) who was a student conducting an eight-month internship at the hospital. Both team members were present when conducting each interview and the RA

transcribed the data from the recordings and performed initial coding based on the

interview script and the scheme devised by the PI. The PI then read and inductively

coded the interviews based on themes and emerging narratives. Both team members were

present for the first two weeks of observations, the RA was present for all periods of

observations. The PI also observed at random times to compare field notes and to ensure

that the same instances were being captured. The RA was responsible for transcribing the

field notes and conducting initial coding based on a coding scheme devised together by

the PI and RA and then the PI conducted axial coding. Both team members administered

the survey at the same time to different staff members.

Coding Team. The PI provided the design requirements for the digital web

version of the tool; a resident programmer at the lab coded the application. The PI audited

two engineering courses at a local university where the PI partnered with four students

and provided them with the design requirements and guidance to program the digital app.

Ethics

This study protocol was approved by Rutgers Institutional Review Board (IRB)

and University Health Network Research Ethics Board (REB). See Appendix F,

Appendix G, and Appendix H for the consent forms approved for participation in

Interviews, Photo sharing, and Surveys, respectively.

The remaining chapters use the various data collection methods employed

(observations, interviews and surveys) to discuss findings with respect to clinician

anonymity and what, if any, impact the intervention (Face2Name tool) or the process of

designing the intervention had on the phenomenon under study. The findings are

discussed as they contribute to the three pillars of design science: design thinking, design

artifact, and design process.

CHAPTER THREE: DESIGN THINKING

Design thinking posits that the first step in effectively designing an intervention is to understand the context for intervention, and in particular the user-experience. Thus, using principles of design thinking, human centeredness and principled experimentation, the nature of inter-professional communication and interactions in the hospital ward were characterized by focusing on the manner in which staff members identify, recognize, and address one another and how they understand inter-professional roles and responsibilities. Thus the experience of clinician anonymity, its consequences and the local strategies that created it and sustained it were the main areas of attention.

To address these questions, a working model of clinician anonymity based on literature and previous existing models was developed. This model was used as a framework for observing and subsequently describing how clinician anonymity is enacted and the implications of anonymity on hospital practice, quality of care and hospital staff. This was followed by further analysis of how anonymity was created and sustained in order to better understand the nature of clinician anonymity and to develop a model of clinician anonymity for the particular site of intervention. The description and analysis of experience resulted in an improved model for the purposes of designing an artifact, and new practices at the particular intervention site. The chapter concludes by proposing key design requirements for developing an artifact and its associated practices for managing clinician anonymity in the hospital ward. These requirements were informed by prior and related research. It is suggested that the insights about clinician anonymity generated here may be generalizable to other similar contexts.

A Model of Clinician Anonymity

In his 1988 paper, Williams called for a greater focus on the role of anonymity in communication. Ten years later, Scott (1998) observed that "as communication scholars, we have not yet begun to develop the models and theories that are so necessary to describe, explain, and predict anonymous communication." (Scott, 1998, p.381). He further argued that, with the advent of mediated communication technologies, the relevance and potential impact of "anonymity" research was likely even greater than it was in Williams' era. However, almost two decades later, research on anonymity in communication, and more specifically involving direct face-to-face contexts, is limited due to the main focus on anonymity as a phenomenon of mediated communication.

Scott (1998) justifies the heightened importance of anonymity in mediated contexts because, as he states: "Anonymous sending and receiving of communication, is never fully possible in non-mediated (i.e. face-to-face) interactions." (p.382). The work that has primarily been conducted with attention to the effects of media provides useful scaffolding to define anonymity in face-to-face contexts. The current study deals with anonymity as a characteristic associated with individuals rather than message themselves, and covers both offline and online interactions. It is also unique in that it is predominantly concerned with face-to-face interactions and expands on existing theoretical models of anonymity which to date are mostly concerned with source anonymity, and its effects on receivers of messages. This research looks not only at source anonymity but also at what I term 'receiver anonymity', and the impact of these 'anonymities' on both senders and receivers of messages.

Building from previous theorizing about anonymity (Anonymous, 1998; Marx

1999), this model focuses on *source knowledge* dimension, or *identity knowledge* as it

applies to the teaching hospital environment. In his work, Scott broadly describes source

knowledge as "the degree of familiarity between the source and the receiver and may

range from the two being complete strangers to being close friends" (p.390). The

proposed model describes six types of source knowledge that map to four types of

identities (identifiers) described by Marx (1999). These identifiers are the practices by

which anonymity is achieved.

The first identity type is the ability to visually recognize an individual. While it

may seem that the capacity to identify the source of a message falls under what Scott

defines as the *source specification* dimension (1998), in the model proposed here, this

refers less to the ability to separate an individual from a crowd (*physical anonymity*), and

more to the ability to accurately identify and individual by the way they look; this maps

closer on to what Marx (1999) terms "pattern knowledge" – which references an

individual's distinctive appearance or behavior patterns. Related to the first identity type

discussed, it is important to explain that in this model (which describes anonymity in

hospitals), there is an equal focus on the anonymity of the *sender* of a message as on the

anonymity of the *receiver* of the message. Or in terms that Scott might be using to refer

to this, both *source specification* and *receiver specification* are equally important when

defining anonymity. The second identity knowledge is what Williams (1988) defined as

simply knowing one by name; Marx (1999) refers to this identity type as *legal name*,

which is usually the answer to the question "Who are you?". The next two identity

knowledge items in the proposed model overlap somewhat with what Marx (1999) refers

to as the *social categorization* identity type. Also introduced here is the knowledge of an individual's professional role with two distinct aspects: 1) the 'name' of the profession (for example Physiotherapist, Occupational therapist, Dietician), and 2) the responsibilities (or the definition) associated with that professional. For example, a *Physiotherapist* may help a patient improve their mobility by giving them exercises, for example climbing the stairs. An *Occupational therapist* is responsible for assessing a patient's living/ working conditions and teaching them how to adjust their new abilities to their environment. For example are there stairs in a patient's house that they must be able to climb in order to continue to live as they were before hospital admission or, in the absence of stairs, is this not a skill that the physiotherapist must focus on. The fifth identity knowledge is the degree of expertise, the skills and specific knowledge that an individual has, which affects the extent to which this individual can contribute to the patient care within a team. For example, within the same profession of 'medical doctor (or physician)', the differentiation between 'student' or 'resident' or 'attending' physician is relevant, and anonymity with respect to this dimension affects workflow: a medical student cannot prescribe medication, whereas a medical resident can, but the ultimate liability remains on the attending physician. Finally, the sixth identity knowledge that is introduced is the association of an individual to a specific group (department, team, ward, or patient). In general when needing to identify a person from a group it may make sense to prioritize identity types in order of specificity, for example from most general characteristics to the very individual ones (e.g. Someone is Canadian, they have brown hair, they are a PhD student, they answer to the name Lora). In the hospital context however this does not have special value since the importance of the identity type

changes with the specific context (anonymity is dynamic). The research team empirically observed that at some points in time it was more important to which group or team a staff member was assigned, and at other times their professional role was more relevant.

Mediated communication aside, staff members must first be able to recognize the individual they wish to communicate with, and therefore, *visual anonymity* is the first obstacle staff members need to overcome. Based on the findings in the hospital environment, staff members' professions and the roles and responsibilities intrinsic to those professions are the second most important identity types. More than one's name, knowledge about one's role and how they can contribute to patient care is how staff identify and feel respected at work. Third most important is the ability to call on individuals by their name. This is a very basic sign of respect, and it can affect staff moral and good relationships. Next in the order of importance in the hospital context is knowing which team, ward or patient the clinician is assigned to. For example, when a nurse needs to order tests for their patient, they seek approval from a physician in the team assigned to her/ his patient; the assignment to a specific team is more relevant than who is the individual physician.

Table 1 summarizes the practices of identification ('identifiers') as introduced by different theoretical models of anonymity: Scott (1998), Marx (1999) and the model that is proposed in this study; and shows how the anonymity types of the three models map or overlap.

Scott 1998	Marx 1999	Appel 2015
Dimensions of Anonymity	**Identity Types**	**Identity Types for Clinician Anonymity**
Source* Specification (physcian anonymity)		outside scope of this study
Source* Knowledge (discursive anonymity)	locatability	outside scope of this study
	legal name	1. name
	pattern knowledge	2. visual
	social categorization	3. Professional grouping (e.g. CTU/Medical team, Allied Health members, Team 7)
		4. Name of profession (PT vs OT)
		5. Responsibilities of profession (PT improve mobility vs OT ensure patient can function in current living and work environment)
	symbols of eligibiligy/ non-eligibility	6. Skill level (Attending physician vs Senior resident vs Junior resident vs medical student)
	pseudonyms linked to name or location	not applicable in this context
	pseudonyms that are not linked to name or location	not applicable in this context
*To date, models of anonymity are mostly concerned with source anonymity, and it's effects on receivers of messages. This research looks at both source anonymity and, what is termed 'receiver anonymity', and the impact of this bidirectional		

Table 1: Practices of identification ('identifiers') as introduced by different theoretical models of anonymity: Scott (1998), Marx (1999) and the model proposed in this study.

Observations of Clinician Anonymity

The following section describes how clinician anonymity is enacted and created at the teaching hospital, based on data gathered from participant observation and surveys (see Methods). The clinician anonymity framework discussed above is used to further analyze the different identification practices and the consequences on the types of clinician anonymity, to help develop the design requirements for the intervention.

How is Clinician Anonymity Enacted?

During many hours of observations, the research team witnessed and identified behaviors that depict enactment of anonymity by the different professional groups who work and collaborate as part of a 'circle of care' to provide care for the patients: the medical team members (physicians, medical residents and medical students), and the

non-medical staff (nursing staff and allied health professionals). These behaviors are described in greater detail below.

Clinician anonymity is apparent when medical team members do not recognize the staff they need to communicate with, do not know their names, or do not have an understanding of the roles and responsibilities of the non-medical team members (nurses and the AH professionals). Here a nurse reflects on lack of knowledge she and her colleagues had about the new incoming medical group: *"Actually last month there was a whole bunch of new ones and we were like: who's doctor so and so? We didn't know if they were male or female, like nothing, we didn't know."* [I.31.03.2014.Nurse]

'Morning rounds' are daily meetings where the medical team can gather information about their patients from the nurses who have been by the patients' bedside throughout the night, and from AH members who have visited patients the previous day. It is also the time when the medical team can put in referrals to have specialists and AH members assess the patients. Observations revealed that oftentimes the medical team does not know whom they need to address when raising a patient issue; they simply make a statement describing the patient's problem and blankly stare across the table to where the allied health members usually sit. Another common occurrence is that the medical team addresses the wrong person; for example, a resident wants the occupational therapist to see their patient, but makes eye contact and speaks to the physiotherapist. And if the medical team is unsure of which professional role would provide the right consult, they bundle several AH professions together, in a catch-all type of addressing (OT, PT, SW). Below is an anecdotal observation conducted during morning bullet rounds. The attending physician (who has worked on GIM for a number of years) suggests it would be

beneficial for their patient to be seen by a clinician that can evaluate the patient's

mobility. As the physician is not sure which of the allied health professional roles is best

suited for the task, they call on two of the most frequently referred allied health roles.

Another clinician picks up on this common occurrence (of generalizing the roles) and

sarcastically remarks that they should just refer the entire allied health team since it is

obvious that people have 'no idea' what any of them is responsible for.

> *"Attd: She [the patient] would benefit from Allied Health*
>
> *SLP: When you say benefit from Allied Health, which Allied Health are you*
>
> *talking about?*
>
> *Attd: PT, OT [laughs]*
>
> *OT: Just throw some speech in there!"* [O.04.04.2014. BulletRounds]

Finally, the most common identification practice that achieves anonymity by the

medical staff is the lack of addressing people by their names. This is referred to in the

model as 'receiver anonymity'. Most of the time, individuals are called at by their

professions: "*We need PT, OT, SLP to see this patient ...*" or even more broadly the entire

professional group is addressed: "*We need allied health to see ...*" The examples

demonstrate two dimensions of receiver anonymity while the source is the medical staff:

1) not using the name of other team members and 2) not demonstrating knowledge of the

responsibilities of the profession required for a specific task (i.e. medical staff are unsure

of which professional role is responsible for addressing their need, and so they call on

every member of the allied health team). Although this depiction of anonymity (calling

on individuals by their organizational roles rather than by their names) seems easier on

the individual staff (not being required to recall names bears less cognitive workload on

people), it can result in delays and even errors, as no one is really aware of whom they are trying to get in touch with, and they might fail to convey the message to the appropriate person (or to any person at all). Moreover, individuals who realize that they are the intended receiver of a message (or instruction) may be offended by not being identified as such, and by the fact that their contribution to patient care is not recognized among the team. In these cases, allied health members are bothered when called on by professional role as opposed to by their name.

At the same time, nurses carry out identification practices leading to clinician anonymity in a similar way: the lack of addressing people by their names, either because they do not know the names or they cannot identify by sight the people who they need to communicate with. Observations of nurses working at the nursing station revealed that when nurses have a message or a question about their patient from the 'most responsible physician' (MRP), rather than approaching the physician directly responsible for that patient, most often they attempt to find him/her by addressing the entire medical team that is assigned to the patient, and yelling out loud: *"Team 6! Team 6?"*, or asking every physician *"Are you Team 6?"* This represents again a type of receiver anonymity that spans three dimensions according to the model: name, visual, and professional grouping identification. In the ideal case, the nurse would know exactly who the MRP from Team 6 is; would recognize her visually, would know her name, would know that she is on Team 6 and that she is assigned as the MRP for the specific patient.

While within the medical team and the nursing staff, manifestations of anonymity are often very explicit, within the AH these behaviors are less frequent; AH staff seem to

know more nurses by name, and, because they are assigned to clinical teaching units (medical teams) they are also more familiar with the physicians and medical students.

Clinician "Actual" Anonymity

In addition to these observations, results from the survey also confirmed the reality of clinician anonymity, as well as the professional group behavior specificity. In the surveys, anonymity was operationalized as the incorrect identification of a staff member's name, and their professional role. Allied health members correctly identify 73% of members of other professional groups, the nursing team 68% of other professional groups, and the medical team only 55%. However, the breakdown by professional groups show that Allied Health and nurses have a very high recall (above 90%) of each other, but both these groups have low recall of the medical team members (below 60%); this is likely due to the very high frequency of staff changes due to rotations in the medical teams, compared to the non-medical staff who is more constant and are more familiar with each other. Of note, the medical team members consistently improved their knowledge of staff within their own profession. See Table 2: Clinician anonymity by professional group.

The survey indicates that between any two professional groups (e.g. nurses and MDs, or AH and nurses, etc.), the recall of members from the other group (by name & role) is similar; for example, nurses correctly identified 53% of medical staff and medical staff correctly identified   50% of nurses; similarly, AH identified 93% of nurses, while nurses identified 91% of AH members. See Table 2. This is an interesting finding, indicating that the reciprocal recall is not dependent on the specific profession, but likely on the amount of interaction (e.g. face-to-face time) they have with each other.

Another important finding from the surveys is that across all professions staff is more likely to remember individuals' roles over their names, pointing to a stronger need to address name anonymity versus other types of anonymity.

	MD & NT			MD			NT		
Allied Health (AH)	Name&Role 73%	Name 69%	Role 76%	Name&Role 59%	Name 57%	Role 61%	Name&Role 93%	Name 88%	Role 99%
	AH & MT			AH			MT		
Nursing Team (NT)	Name&Role 68%	Name 66%	Role 70%	Name&Role 91%	Name 91%	Role 91%	Name&Role 53%	Name 50%	Role 56%
	AH & NT			AH			NT		
Medical Team (MD)	Name&Role 55%	Name 41%	Role 69%	Name&Role 63%	Name 56%	Role 69%	Name&Role 50%	Name 31%	Role 69%

Table 2: Clinician anonymity by professional group – survey results

Clinician Perception of Anonymity

Clinicians' *perception* of anonymity (operationalized in the surveys as the amount of inter-professional names they *thought* they could identify) suggests that staff is aware of the problem of clinician anonymity. On average, staff expected to know only few names of their inter-professional colleagues a week into a new rotation (pre); more surprisingly, even after a month of working together (post), they were still skeptical about knowing by name more of the inter-professional members. When comparing perceived to actual anonymity, both at the beginning and end of a rotation, staff thought they recognized less inter-professional staff than they actually did. This shows that staff has a strong belief that clinician anonymity exists, and that that belief may be even greater than the reality. In practical terms this may translate to having an intervention unnecessarily geared towards anonymity due to the perception that it is higher than it actually is.

This was different when the perception of familiarity within the boundaries of their own profession was examined: as expected, staff are confident that they know better the members of their own profession; this shows that people who work together in the

same place and spend more time together, believe that they know each other better. Across all clinicians, the names of the medical residents and medical students were perceived the least well known (excluding members of the same medical team, e.g. Team 6, Team 8, etc.); they expected this behavior due to the frequent rotation of staff in this group. See Table 3: perception of clinician anonymity by professional group.

	# of names remembered	AH		NT		MD	
		PRE	POST	PRE	POST	PRE	POST
Allied Health (AH)	Few	3%	0%	6%	0%	16%	13%
	<50%	0%	10%	34%	39%	53%	61%
	>50%	25%	23%	19%	19%	16%	19%
	Most	72%	68%	41%	42%	16%	6%
NurseTeam (NT)	Few	3%	3%	0%	0%	32%	24%
	<50%	21%	7%	2%	0%	44%	40%
	>50%	45%	54%	5%	10%	16%	29%
	Most	31%	36%	93%	90%	8%	6%
Medical Team (MD)	Few	24%	6%	35%	9%	3%	3%
	<50%	38%	40%	53%	66%	44%	23%
	>50%	26%	46%	12%	20%	24%	43%
	Most	12%	9%	0%	6%	29%	31%

Table 3: Perception of Clinician anonymity by professional group – survey results

To summarize the findings about clinician anonymity from observations, interviews, and surveys, overall there is low familiarity among staff, there is little improvement over time, and when there is an improvement, it stays usually within the boundaries of the same professional group. Diving more into the various dimensions of anonymity, practices of identification vary with consequences for types of anonymity achieved. The medical staff and nurses are the organizational groups whose practices of identification generate most instances of anonymity; not knowing names is the type of anonymity most often enacted, followed by not knowing the description and distinction between AH professional roles. All types and manifestations of clinician anonymity are

most prevalent across staff of different professions (i.e. they manifest inter-professionally).

<div align="center">**Consequences of Clinician Anonymity**</div>

The previous section presented findings regarding how identification practices (ie. how staff identifies and addresses each other) generate states of communication quality (i.e. different types of anonymity). This section examines the consequences of these states on inter-professional communication and workflow. Drawing from the interviews, this section highlights the consequences that each type of anonymity has on patients' quality of care and staff satisfaction.

Detrimental Impact on Patient Care

It is generally acknowledged by staff that clinician anonymity has consequences on the quality of patient care, both short and long-term, as reported by an attending physician during interviewes:

> *"I know if the allied health team and the medical team have an adversarial relationship the patient care suffers, I've seen that happen. I've also seen teams where the medical team and the allied health teams have a good relationship and I think patient care is better."* [I.10.02.2014.AttendingPhysician]

An example brought up in several occasions was about referrals. In the next quote, one allied health member idealizes the way communication should be happening, explaining that when the medical team is better informed about people's roles and responsibilities, they make more appropriate referrals [to specialists]:

"Oh yeah, if people know your name they are going to know what you do and they are going to make more appropriate referrals. If you're talking to people and you know are more present in their mind, they are going to make better referrals and have better teamwork but if you're working in silo, allied health versus the medical team it's not as good as when we're working together."

[I.15.07.2014.OccupationalTherapist]

When the right referrals are made, different specialists assess, evaluate, and diagnose different aspects of a patient's condition. More aspects of care are considered and therefore the options presented to the patients in preparation for discharge are often more appropriate for their specific living environment. When occupational therapist (OT), physiotherapist (PT), social worker (SW), etc. are not involved as expected, however, the patient care might be negatively affected. For example, a physician can recommend that a patient not exert themselves for the first few weeks after discharge, but without involving the OT the fact that the patient lives on the 7th floor in a building with no elevator would likely not be known; or without the involvement of a SW it would not be known that there's nobody to help this patient get their prescription from the pharmacy, or shop for groceries. These relevant details can greatly impact patient's care. Here another OT describes a situation where her evaluation would benefit patient care:

"...if I did my job in silo and I didn't communicate any of my results or recommendations to the team members then those things would fall by the wayside. Let's say I had to recommend a geriatrics referral because I'm spending a lot of time with the patient and I'm picking up on something that no one else has yet, so I'm communicating that to the medical student who's then making, oh

sorry the resident whoever it is that's making that referral to geriatrics which I think is really beneficial to the patient obviously. So I think that would have a positive effect." [I.15.07.2014.OccupationalTherapist]

Clinician anonymity can negatively affect collaboration around patients' care; less information is shared, less questions asked, less concerns discussed. The following three quotes reveal that clinicians with different roles and professions all have an orientation to a preferred form of communication, which would benefit patient care. In the first quote, an attending physician describes how nurses never approach him, and his belief that patients could benefit if nurses were more familiar with the attending staff:

*"I do think that the attending physicians, if nurses felt comfortable approaching the attending physicians that would definitely improve patient care. Because I can guarantee you there has been times where a nurse has talked to a junior resident and said I'm worried about Mr.'s blah blah blah. And the resident said okay, and was either too busy and didn't get to see the patient or dismissed them and I never get communications directly from the nurses, **ever.** So I would assume if the nurses knew me, knew how to find me, knew how to communicate with me they might say I let your resident know about this an hour ago but no one came and then I would go and check on the patient. Because that's exactly the relationship I have with the allied health."* [I.10.02.2014.AttendingPhysician]

In the second quote, when asked about poor communication caused by clinician anonymity, an allied health member explains how she thinks this could affect the discharge planning and may result in an otherwise avoidable patient readmission.

"I think it does, I think that we need to address it as quick as we can if there is

that kind of conflict, and I think that it also affects patients; we're in a process of

moving patients around, discharge coordinating, discharge planning and we need

to have that communication, to all be on the same page, because when we're not

all on the same page I feel that's when poor discharges happen and I feel

readmissions happen after that." [I.26.02.2014.SocialWorker]

Finally, in the third quote, a nurse describes the same phenomenon: how clinician

anonymity also affects people's emotions and can create animosity among staff, and that

if staff is annoyed, unhappy, or feels underappreciated, they are likely to carry these

attitudes with them by the bedside.

"Yeah, because if we don't talk, we're not talking about the patient and what they

need you to know, so I think it absolutely can impact patient care. I think how we

treat each other, I don't think it changes when we're going to see a patient right?"

"You know, let's say me and you, for certain reasons, for whatever reason I lose

my calm with you, it's not a switch that I turn it on with you and then all of a

sudden I see a patient and I'm all happy and rosy, no; If I'm upset with you it

doesn't matter how hard I try to mask it, your upsetness comes through, right?,

for most people; and that's what I believe." [I.05.08.2014.Nurse]

As can be seen from these quotes, the gaps demonstrated in the survey results are evident also in the interviews. Clinicians' beliefs on how communication 'ought to be' warrants the pursuit of a strategy that reconfigures identification practices to manage anonymity differently in this setting.

Generating Inefficiencies

Inter-professional communication suffers due to inefficiencies caused by the phenomenon of clinician anonymity; such instances occur when staff is trying to find the right individual from whom they need to get more information about a patient, but the required individual is not known by name, or sight.

> *"There was a day when we were trying to consult a specialty service and we weren't hearing anything back, whether their pager was broken, there was some breakdown in communication. I knew one of the residents who was on that service because I had worked with him a month ago so I called him directly for the consult and it was great; it works out well and for the patient, that kind of connection is easier and it helps with patient care. At the same time, if that hadn't have worked, we would have been continuously trying to call them, like every two to three hours with no reply. So it would be nice if we had more face time with people some social event or something; it's tough… if I know them it's easier to be like: oh hey, they already know, it's just about this patient, is this what we need to do? If you don't really know them then you have to start off slower."*
>
> [I.07.02.2017.MedicalResident]

A typical scenario that exemplifies how these inefficiencies are created is as follows: the physician has questions about a patient and needs to quickly get in touch with the nurse

responsible for this patient; the physician goes to the nursing station, looks at the electronic whiteboard to find the name of his patient's nurse, then has to figure out where the nurse is: are they at the nursing station? are they with another patient? are they on break? If the physician knows the name but does not know the nurse by sight, he/she may start employing inefficient and disruptive identification strategies: calling the nurse's name out loud and hoping that the nurse is nearby, or assume someone else around them knows where this nurse is. Or, paging the nurse using the loudspeakers over-head system, which, according to all staff, is noisy, disruptive, and uninformative[1]. Then, either the nurse from where he/she is, would start a similar search to find who called for them and why, or the physician would repeat this process at a later time. If staff were knowing and recognizing each other, this 'blind' searching process would not be necessary, saving time and reducing disruptions caused by paging repeatedly. Below a medical student describes the difficulty with waiting for a specific nurse when wanting to discuss a patient, and points out that the alternative is even worse.

> *"Sometimes it's hard, it would take a long time for the nurse to come because she was at another patient and everybody is so tight for time and you're just standing around. Sometimes they would be on break, so now I'm talking to another nurse. I didn't think it was the best way but it was better than going around to every room and calling out the names."* [I.06.03.2014.MedicalStudent]

Here is how another resident confirms that knowing the inter-professional team members by sight and name would speed up workflow:

---

[1] The page only requests that a specific staff member come to the nursing station, but for privacy reasons, cannot detail why they are being asked to come, or who they should expect to meet. Often times when a staff member is paged, they are busy and by the time they arrive at the station, the person who wanted to meet with them is no longer there. So there is no history of who they wanted to meet or why.

"The embarrassing factor … I should know people's names; it's the simplest

thing to know and it's frustrating when you don't. Also just like communication…

it could facilitate; instead of having someone paged overhead or leaving a note in

the chart you could just find them. If their face and their name just match [clap]

you could talk to them and I think things would just get done and there would be

less errors missed because you could just go talk to someone instead of leaving

messages on the computer." [I.07.02.2014.JuniorResident]

Impact on Staff's Emotional State

"I've seen it, I've seen pharmacists; sometimes the nurse will go up to a

pharmacist and say "hey pharmacist" or "hey pharmacy" instead of "hey

MaryAnn" or "hey Julia" I've seen people get offended "I'm not pharmacy,

that's my role and this is my name." [I.05.08.2014.PCC]

In addition to negatively impacting patient care and generating inefficiencies in

work-flow, people's feelings are hurt and relationships negatively affected by

manifestations of clinician anonymity, as depicted from the quote above. Four kinds of

impacts on emotion states were identified in the interviews. These are explained here

referring back to the clinician anonymity framework. Team members are hurt personally

and professionally when their names are not known or their roles are poorly understood.

Observations revealed tempers starting to flare, rolling-of-eyes, and direct confrontation

following such instances, especially after people have worked together already for some

time and the instances keep repeating. Below, an occupational therapist describes an

instance when she became very emotional after a medical staff member did not know her

name:

"I'm not insulted if someone says like "Are you the OT?", and I'll say "Yeah I'm Nadine" but yeah if that happens more than twice you should learn my name. I remember talking to the senior and he didn't even know my name and it was near the end of his block, and I was like its really inappropriate and I think that you should know my name." [I.15.07.2014.OccupationalTherapist]

There is a wide range of emotional reactions to not remembering people's names; some of the interviewed staff did not mind nor expected others to know their names, but others were quite offended.

Awareness proved to be a key factor: some staff were not at all aware that by not remembering one's name they might offend their colleagues. In the example below, an attending physician explains that he become aware of the situation only from his wife, an allied health professional, who shared her feelings with him:

"She finds it offensive when she has been on with the same residents for two months and they don't know who she is. But it's different because she's an allied health member and she goes to bullets; they sit every morning together. She doesn't hate it if they don't know her name but she does find it quite offensive if they don't even know that she's the speech pathologist after two months of sitting together every morning. So I can imagine that the nurses will probably have a similar feeling over time I don't think they give a shit about the residents as the residents come and go but I think from the attending doctors. She hates, the attending doctors who do not know her name, she does not like. She's worked with some of them for 5 years and they don't know her name."

[I.10.02.2014.AttendingPhysician]

It is however interesting to observe, that above and beyond remembering their names, staff were adamant about people (other staff members) knowing their roles. Their professional capacity is the most important characteristic of their identity; they need to feel valued and respected for the work they do for patients. Given the priority on efficiency, knowing one's professional role also makes sense, as is it most relevant or necessary for accomplishing an institutional task. As such, this key identification practice, knowing one's professional role, seemed preferred over name identification, and pointed to an important design requirement that has to be emphasized. On the other hand, staff who could not identify colleagues by their names, mentioned having feelings of embarrassment, which grew into "*feeling like an idiot*" after working together for a longer time. The quotes below are by staff belonging to both the medical and the nursing professions:

> *"I have nurses who, when I walk through the hallway, they say good morning Phil, and I don't know what their names are, I can't remember, I try, I feel bad every time."* [I.10.02.2014.AttendingPhysician]

> *"After a few months of working with them you feel like an idiot if your still asking their name but I still make the point to say I'm Erin by the way, what's your name? Sometimes you don't even know their roles."* [I.05.08.2014.PCC]

These feelings of embarrassment and being uncomfortable result in situations of awkwardness when calling on specific staff for help. They occured from the inexperienced medical resident to the veteran attending physicians, as illustrated by the following quotes:

"It's so awkward… but it's like shoot – I don't know your name and this is so stupid. It's a real pain because if you look at the whiteboard and want to talk to their nurse and you know all the nurses by face but you don't know their names then you're like "Who's Kendra?" But then you see her taking care of your patient and you were probably just talking to Kendra but you didn't know her name was Kendra so it's not good" [I.07.02.2014.JuniorResident]

"I don't mind looking for the nurse, it's just that it's very awkward when you say: can I talk to the nurse who is taking care of this patient? and then she's like: oh that's me, my name's up on the whiteboard. ...Sorry I don't know your name, it's very awkward" [I.10.02.2014.AttendingPhysician]

Potential Benefit of Clinician Anonymity

While there are many observed negative consequences to clinician anonymity, there may also be some potential benefit that merits attention. An attending physician revealed that while getting to know other staff on a more personal level (including knowing their names) would be beneficial, they also recognize some advantages associated with the anonymity among staff:

"For the nurses, I don't know, probably patient care would be better if we had better relationships with the nurses; but now that we have the blackberries I sort of feel that there's maybe even advantages to that, because if you have a situation where a nurse is afraid or intimidated by a doctor for whatever reason there is this anonymous blackberry that they can send messages to. She doesn't even know who's holding it; she doesn't have to feel bad: oh I don't want to bug that doctor

again; she can just say this problem and then she sends it off rather than feeling like she's bugging somebody. I can definitely say there are advantages and disadvantages. I agree no doubt that overall job satisfaction and collegiality would improve." [I.10.02.2014.AttendingPhysician]

This was also observed in a previous study that looked at how patients and physicians identify one another. Sometimes there is unnecessary bias or tension created when a person (patient or clinician) makes assumptions about whom they are going to meet, based on sight, name or role.

As reported earlier, along with inefficiencies, anonymity can also contribute to the creation of a fast-paced environment, as individuals are not tasked with additional cognitive load of remembering their colleague's names.

How is Clinician Anonymity Created?

The preceding section described *how* anonymity is enacted, how, when and where it manifests, how one might be able to 'observe' clinician anonymity and its consequences on hospital practices. However, for the success of any intervention designed to reduce clinician anonymity, it is important to identify and understand the causes that led to this phenomenon. By understanding the causes, the intervention can better target those causes that can be removed, and at the same time deal differently and account for the ones that are intrinsic to the given context and would be difficult to change. *Why* clinician anonymity occurs in the hospital context, and the potential factors identified by staff to be responsible for generating this phenomenon are discussed below. Broadly, they can be divided into environmental characteristics, and socio-cultural behaviors, which may also mean practices (in particular communicative practices and

practices that have communicative implications). Both have overlapping elements, where the environment directly affects the culture of the people, and vice versa.

Among the environment related characteristics, the most influential was found to be the very nature of teaching hospitals: fast-paced environments characterized by very frequent staff rotation. The underlying factors that affect anonymity are frequent and non-synchronized staff rotations across all professions, very short time of direct (face-to-face) interactions, and the large number of members that belong to the "circle of care" that surrounds a patient. The characteristics that stem from this type of environment but essentially fall under cultural behavior are the real and perceived importance for speed, urgency, and high efficiency manifested in these teaching hospitals. In addition to the overarching sense of a dynamic, fast-paced work environment, where technology often becomes the main means of communication, there are also cultural norms that form in the contexts of the different departments (e.g. GIM), and between wards (13th versus 14th floors) and professions (medical, nursing, or allied health) within the departments. Among cultural factors, the lack of introductions, inefficient inter-professional orientations, and the power dynamic between professions have the strongest perceived impact on clinician anonymity.

The following sections explain in detail the findings related to how clinician anonymity is created, and provides supporting evidence collected by researchers during 'shadowing' observations and from interviewing staff.

Environment – Teaching Hospitals

The "teaching hospital environment" was mentioned most frequently during interviews as the cause for anonymity among staff.

"I think one of the main problems and it's just the nature of the beast, is that it's a teaching hospital so there's also going to be a rotation of med students and interns so it's always going to be like that and that's part of it."

[I.31.03.2014.Nurse]

A teaching hospital is a hospital that is affiliated with a medical school and provides the means for medical education to students, interns, residents, and sometimes postgraduates (Merriam-Webster). Teaching hospitals are also strengthening relationships and establishing partnerships with other health care workers' educational institutions, such as nursing schools and schools for other clinical professions (e.g. Occupational Therapists) (American Association of Colleges of Nursing, 2006). Teaching hospitals differ from community hospitals in several ways. In order for medical residents to gain experience in a number of specialties, they are 'rotating' (i.e. moving) frequently for short periods of time (4-8 weeks) between different departments and different hospitals, thus creating less continuity among staff, and among care-teams formed around patients. Because medical residents are still in training, the burden of responsibility for patients' care is shared across a number of people with varying years of medical experience. These characteristics of teaching hospitals make it more difficult to know members' roles, skill levels, responsibilities, and ultimately who gets to make decisions regarding patient-care, and who is liable. Not only do teaching hospitals have far more clinicians than community hospitals, but they also have a greater number of staff with various professions in general, as there are often research and innovation initiatives taking place in these hospitals.

Interestingly, the challenges caused by the nature of teaching hospitals are understood and somewhat accepted by the staff, as being the normal way of working. This undoubtedly contributes to the persistence of clinician anonymity, as discussed in a later chapter. Frequent rotations make it more difficult for nurses to do their jobs, but they have grown to accept, and even accustomed to this workflow:

"The only issues we see is this is a teaching hospital and most of the physicians - residents change every month to two months and that is a bad thing sometimes but again this has become sort of second nature and this is nothing new."

[I.05.08.2014.Nurse]

The previous two quotes by nurses portray an acceptance of the situation that might have otherwise been attributed to the perceived culture of nurses as being resilient and perseverant, but this acknowledgement was also observed in other professions. It was not just the rotations among the medical team that created this feeling; physicians too felt that the nursing shifts (twice a day) contributed to anonymity.

An added challenge with rotations is that they do not occur all at the same time, therefore it is difficult to track and be prepared for new staff coming in; various groups rotate on different schedules, some medical students every two-weeks, others start on the second Tuesday of the month, and some are just "fly-ins" (a term used for unplanned temporary substitutes for sick days or on-call night shifts).

"Sure, that's a new problem, the residents used to switch over on the first of the month. That just changed, just recently… they just switched it in July and that's creating a "nobody knows who's coming or going". I used to always know that the 1st and the 15th, the residents start on the 1st of the month or at least the

Monday and now we have no idea. I don't know, now we will have to figure it out."

[I.10.02.2014.AttendingPhysician]

The lack of face-to-face interactions between clinicians was brought up as another main reason for people not getting to know each other. There are few regular face-to-face meetings where all inter-professional team members review the inpatients on that ward and in this context become familiar with one another. The main opportunity is during the daily "morning bullet rounds", a short and to-the-point meeting, where each medical team is given 15 minutes to cover all of their patients. Residents agreed that the speed of the rounds is not conducive to getting to know other staff: *"I think it's hard to get to know really well because you see them at bullets but that's exactly what it is, it's bullets so it's so quick."* [I.06.03.2014.MedicalStudent] Moreover, the timing and structure of these rounds[2] match the workflow of medical residents and students, rather than all staff equally. Allied health members feel their time is wasted as they are often left waiting around for the 15 minutes in between their teams' allotted times, and this is sometimes a reason for them to not join the rounds. Rounds are also held at a time, and in such a manner (all at once) that prevents most nurses from attending. Often only a small number of nurses ("nurse managers" and "charge nurses") attend and later relay the information back to other nurses. The result is that the daily "inter-professional" meeting almost entirely omits one professional group: the nurses.

> *"Nursing and the doctors are kind of separate beings [laughs] … There's this*
>
> *whole thing of the doctors operate over here and the nurses often feel very*

---

[2] Morning rounds are divided into 15-minute segments designated to each of the 5 teams They run from 9:00-10:15am every weekday)

disenfranchised because they're the ones that are closest with the patient and they

never come to rounds." [I.07.08.2014.SpiritualCareAdvisor]

One Attending physician pointed out that most nurses don't attend "morning bullet rounds", but if they were attending, it wouldn't be efficient. Efficiency and productivity are highly valued in teaching hospitals; having nurses present at the bullet rounds was perceived as inefficient. This is a kind of dilemma; perhaps the current way staff conceives this dilemma is actually part of the communication problem they experience.

> *"I need to know nurses but it's impossible to get to know nurses. It's one of the*
>
> *biggest challenges. There are just so many of them, they move around so much,*
>
> *they don't come to bullets – having said that I've been to bullets where nurses do*
>
> *come and it's not productive."* [I.10.02.2014.AttendingPhysician]

It is not just the inter-professional meetings that run at high-speed, the underlying essence of teaching hospitals are that they are fast-paced. Teaching hospitals are often located in urban centers; not only do they admit more patients and therefore often have more "work", but like in financial city-centers, there is a culture of speed, urgency, and importance adopted by those who work in this environment. Technology replaces direct contact and communication becomes impersonal.

> *"So everything is moving so quickly that you want to just get straight to the point.*
>
> *I think that's what makes it difficult, the inconsistency of who's taking care of a*
>
> *patient directly, who should I communicate with, who's holding the blackberry,*
>
> *sometimes we call the blackberry and we have no idea who will answer,*
>
> *sometimes they don't say who they are."* [I.25.03.2014.Nurse]

It is interesting to note that according to some staff the feel for constant urgency and fast paced conditions are seen as perceived more than a real requirement:

> *"I actually think the medical teams are quite terrible with introducing themselves to people and I think it's the medicine teams. Usually, other allied health are pretty good about it, medicine is always in a hurry or think they are, everything is urgent when it usually isn't that urgent."* [I.31.03.2014.Nurse]

It is important to stress the positive effect of working closely together and meeting face-to-face day in and day out, on how well people know each other. There is no manifestation of clinician anonymity within the medical teams; even though they are the ones that rotate most frequently, they get to know one another well and remember each other's names within a short time.

> *"Getting to know my own team, like the physicians the residents, you get to know them really well because you are always with them, it's like team medicine, you're always talking about patients and you round multiple times a day. It changes within the eight weeks I had two different junior attendings and one staff and then a bunch of residents and stuff but you still get to know them really well because no matter how often they change you're still with them all the time…In terms of the other allied health it's really hard to get to know them and they don't even change! That's the funny thing, they stay the same and the actual medicine team, like the doctors and the residents, they change more often and I still know them better."* [I.06.03.2014.MedicalStudent]

Environment – Teams and Wards

The different organizational structures, whereby physicians and allied health members are grouped by teams (Clinical Teaching Units), while nurses are organized by wards, further separates the nursing staff from the other health care staff, limiting the opportunity for joint activities and face-to-face interactions; this inevitably has led to increased clinician anonymity. One nurse reported: *"They go out amongst themselves like the doctors and the OTs and they play baseball games and lunches and dinners and stuff but nursing is, again we're not team aligned it's different, the culture is different"* [I.05.08.2014. PCC] She went on to note: *"The pharmacists are inseparable, like they stick to their teams but nursing isn't that, well we're not team aligned so it's kind of hard to do that but I think we could definitely improve our approach."* [I.05.08.2014. PCC]

Even within each nursing ward, there is a culture that impacts how staff interact, and how clinical anonymity is created. Nurses are assigned to wards (floors) predominantly for practical (efficiency) reasons. They must be by the patients' bedside 24/7, so it doesn't make sense for them to be caring for patients on a different floor. There are two wards in the department of medicine (GIM), one on the 13th floor and the other on the 14th. In all respects, these wards are independent, each with its own nurse manager who gets to hire, organize, and manage the workforce on their ward. The distinction between the nurses working on the two floors is hard to miss; the 13th floor also houses the morning bullet rounds, and as one occupational therapist makes note, being more often on the 13th floor ward can impact how well the other staff get to know her.

> *"Maybe I spend more time on 13. I'm there in the morning between rounds. To me 13 feels like a home base where rounds is there, I'm there at the beginning of*

the day, I'm there at the end of the day usually. …There's also like … there's a

couple of nurses that are younger that I'm friendly with on 13 so that probably

helps as they probably say my name and people hear it."

[I.15.07.2014.OccupationalTherapist]

As she converses more with those nurses, they become more familiar with her, call on her

(by name) more frequently, and this way other staff on that floor have a greater chance of

hearing, remembering, and putting her "face to a name."

Environment – Signoff on Medical Orders

Clinician anonymity is also a direct result of the fact that physicians hold the

ultimate responsibility when it comes to patient care; this dictates how other collaborative

processes and standard procedures are designed on the ward. Non-medical staff have to

get sign-off from physicians on patients' referrals to specialists, patients discharge,

submitting lab test orders (e.g. blood work, X-rays, MRI, etc.). This results in one set of

professions needing to disproportionally contact another, and the names most often being

written are those of the physicians. Looking repeatedly for the physician responsible to

sign-off orders helps others to remember their names more quickly than other staff. For

example a nurse would have to call on their patients' physician to get a blood-work order,

and the only way to do so is to know the name of the physician and get them to sign-off

the order. While the inverse may happen, i.e. a medical resident may seek out a nurse for

patient information, it is not an absolute necessity for them to perform their work.

The same was mentioned also by medical residents in relation to allied health

members: *"I'll remember the ones [names of allied health team members] on our sign*

out sheets if they're actually filled out." [I.06.03.2014.MedicalStudent]

Culture – Formal Introductions and Inter-professional Orientations

The lack of basic person-to-person introduction etiquette (or "human manners", as it was referred during interviews) is a contributor to the creation of anonymity. Some staff still expect to introduce themselves and be introduced to new people whom they are going to work with. However, as simple a norm as this might be, it generally does not transpire in the hospital environment, as reported here by a Nurse.

> *"Well I mean it's just manners, introducing yourself to somebody. You know what this could make me sound old school but it's a very simple old thing; my grandfather was a doctor and if he saw the way things were going on now he would do backflips in his grave. It's just a different era, it's a different time, a different way of communicating. And I go into my patients' rooms every morning and introduce myself and say I'm Jen, I'm your nurse today. If they don't know who I am that's fine but I do introduce myself."* [I.31.03.2014.Nurse]

The lack of formal or informal introductions and not having effective inter-professional orientations are major factors that were observed and reported to contribute to clinician anonymity. Staff spends much time with their colleagues intra-professionally, so that they do a good job at getting to know each other (medical residents know the medical students, day nurses know one another etc.). However there is no effective process for introducing members of the different professions (with names, roles, responsibilities) to one another. When asked about formal introductions, one attending said: *"Not really, I don't do anything formal. I know there are rounds where they meet the various allied health team members, I'm not usually around for that."* [I.10.02.2014.AttendingPhysician] Although there is an established allied health

orientation for the new medical team members, not all allied health professionals attend, and according to the medical staff not enough time is dedicated to convey the relevant information. One resident recalls: *"it was like interview, not a conversation between people."* [I.31.01.2014.MedicalFellow]

> *"In terms of the allied health we had an orientation at the beginning and I think we spoke to the social worker, umm, to occupational therapy and I think that was the only two that came to our session"* [I.06.03.2014.MedicalStudent]

An attending physician felt that instead of formal introductions, having a presence at morning rounds everyday was a better way of getting to know the inter-professional team members.

> *"Certainly though when new members of the team come at bullet rounds I stop to introduce them around the table so everyone can know. Because I know the allied health team very well and I meet the medical team and get to know them informally, I think it's very important to me to encourage interaction; for example I insist that all the residents and medical students attend bullet rounds every day… I think everyone needs to be there every day, I think it's really important that the residents get used to interacting personally with the allied health team."*
> [I.10.02.2014.AttendingPhysician]

However, other staff commented negatively on having introductions done during the rounds. While she was trying to educate the medical residents on her role at an orientation, they were too busy with their phones:

> *"I've done orientation to the medical students when they start their rotation if it's on a Tuesday or Thursday but a lot of them are on their phones. …for them it's*

about how much medical knowledge they can absorb in a very short period of

time and I understand that." [I.07.08.2014.SpiritualCareAdvisor]

While there is some level of interaction between members of the allied health and the

medical staff through repetitive face-to-face meetings at morning rounds, it is more of a

challenge to introduce the nurses to the medical teams. On the other hand, one nurse felt

that the permanent staff could be doing a better job at welcoming the rotating residents.

"I guess it's our choice, it's our unit. They're our guests and we need to be more

out there putting ourselves, letting them know that they are our guests but we

don't do that as nurses very well." [I.05.08.2014.PCC]

Some nurses stated that the medical team intentionally avoids revealing their names. In

GIM, each medical team carries one "team" blackberry smartphone that they rotate

between the members of the team; each day or half-day a different member is responsible

for answering calls and checking emails. When nurses call the 'team blackberry' to

communicate about a patient, they are contacting someone on the medical team, but they

don't know who that team member is. Interviews revealed many complaints about the

lack of identification when a staff member is answering the phone:

"So if I need something for a particular patient, that page will go through to

whoever is carrying the blackberry ... But then again I still don't know what they

look like. And sometimes they will be like: it's team 8 and they won't give us their

name; but I need your verbal order to write it. It's like: who are you? The thing is

that they still don't introduce themselves over the blackberry. When I'm calling I

say "hi it's Heather from 14 Eaton" so that at least they know my name and if

they do come over to the floor then at least they know who they're looking for or

if they need to call back they know to call Allison back" [I.31.03.2014.Nurse]

Culture – the role model of Attending Physicians

"They probably ask "Are you the OT?" rather than "Are you Ellen?" The only

case that they'll ask "Are you Ellen" is if Dr. Ziman is on staff, because he

always tells them to learn our names. So they always learn OT, PT, social

worker's names so they'll address me by my name."

[I.15.07.2014.OccupationalTherapist]

Attending physicians[3] can have a direct impact on clinician anonymity. Not only do they serve as role models but they are also responsible for evaluating the students; thus if they encourage the team to interact with staff of other professions, the team members might consider this part of their team's goals. Here is how an allied health member sees the value of the attending physician with respect to building inter-professional rapport:

"The attending has a huge, huge impact on how the team views the allied health

team, 100%. So if the attending physician really values all of the allied health

team and instills that in all the residents then they're going to utilize it. But if the

attending is focused on one profession over another than the residents are going

to follow suit and you can see that at rounds, it's really obvious"

[I.15.07.2014.OccupationalTherapist]

---

[3] Attending physicians are the most senior physicians on a team; they teach the residents and medical students. Much of the team's dynamic is set by the attending physician: how much responsibility each member gets, the value they place on suggestions given by other inter-professional staff, how frequently to communicate with other staff.

It is the responsibility of the attending physician to teach their residents and medical students about the value of working in an inter-professional team. One allied health member explains:

> *"Even to just let the residents know "hey this is Nina" …some attendings will say this is the person you need to know, this is the person you see for this. This is a teaching hospital so they'll teach around if you need a rehab this is who you go to, if you need home care this is who you go to, talk to this person, it's almost like that ongoing talk to them, they'll help you or can you do this, can you do that; it's more that back and forth and sometimes you don't get that back and forth as much."* [I.26.02.2014.SocialWorker]

Attending physicians are also a good source for introductions. They have a captive audience, and so whomever they introduce, the team is more likely to be remember:

> *"It also depends which doctor is on the team, so if a doctor is on the team who knows me really well and that I've worked with for the past three years then they'll usually do a good job of introducing me to the residents. If they don't then it's more up to me to do that but there's no formal process other than the allied health orientation rounds and I don't go all the time."*
>
> [I.15.07.2014.OccupationalTherapist]

Many times residents idolize the way a particular attending physician manages their role, and attempt to model their actions on their behaviour. A nurse comments on the approachability of attending staff:

> *"I think that being approachable is one of the characteristics and the staff makes a big difference. You know Team 6 does all those studies or whenever Dr.*

Ziman's on, I tend to know. I think the staff makes a huge difference too, if they come with this, I don't know, some of the staff are more approachable and they are more present in rounds and they teach their residents that you need to be more, you should communicate more with the nurses and the allied health, they're good role models for the residents. Whatever they role model the residents will follow." [I.05.08.2014.PCC]

Culture - Power Dynamic between Professions

There is awareness among staff that the way the healthcare system is organized, some professions are given more clout than others. It has been widely documented how the issues of power, privilege, value, responsibility etc. historically have, and continue to, dictate much of the relationships between physicians and other staff (such as nurses and allied health members). Below an allied health member described her knowledge of the existing power dynamic in the hospitals, but advocated for better communication strategies among inter-professional staff.

"I appreciate what the doctors do and I know they're very busy but everybody else is really busy too. It's just that because they have to sign off on orders there's this sense of they have more power and privilege than everybody else. There are some things that just are but there's a difference between having power and privilege and letting people know you have power and privilege. Do you know what I mean?" [I.07.08.2014.SpiritualCareAdvisor]

Although General Internal Medicine deals with patient-care in a team structure, where a number of different professions evaluate the patients, it is the physicians who have the final sign-off on orders, as well as the ultimate responsibility and liability when

it comes to patient care. This creates a power dynamic between professions, with non-medical staff often complaining about the lack of *"appreciation beyond medicine."* [I.15.07.2014.OccupationalTherapist] It also contributes to a lack of awareness about the people who fulfill non-physician roles (usually the allied health professionals and the nursing staff), who sometimes struggle to have their voices heard, leading to increased anonymity towards them by the medical staff.

The example below captures the frustration of an occupational therapist when feeling anonymous to the rest of her team. It is the greatest form of clinician anonymity: their name, profession, and responsibilities not being known by the members of their team.

> *"I'm thinking back to a couple of months ago where I just felt the team didn't even know I existed and I was trying to make myself heard in rounds. I was like I'm the OT, I'm Nadine, this is what I do and then there was no appreciation for what felt like OT in general."* [I.15.07.2014.OccupationalTherapist]

Several interviewed people highlighted the need for more "personable, attentive, respectful" communication, mentioning *"the way people ask things of you"*. [I.26.02.2014.SocialWorker] The culture of valuing medical expertise above all was perceived to result in a lack of appreciation and unawareness about the roles, responsibilities and potential contributions of other staff. And if a staff member was not being called on for advice, there was no need to remember their name.

This imbalance in roles and responsibilities creates almost a *unidirectional anonymity*, where "medical" staff (i.e. physicians or medical students) primarily know other physicians and are less familiar with members of other professions, while non-medical

staff (i.e. health care professionals other than physicians) have to know the medical staff in order to perform their professional activities.

Culture – Shielding differences between similar professions

It is interesting to note that while some professions fight to get their roles and responsibilities recognized, others seem to try and mask the differentiation among the staff, in some ways intentionally increasing clinician anonymity with respect to their profession. Physicians are often 'blind' to the differences between Registered Nurses (RNs) and Registered Practical Nurse (RPN) on the ward.[4] One attending physician remarks:

> *"I think it would get huge push back if you identified them, I don't think you're supposed to know because I think there's a worry that you would create a class system in the nurse culture and you would go to the nurse and not the RPN so I think that they don't want you to know. That's my impression but I could be wrong"* [I.10.02.2014.AttendingPhysician]

While this aspect of the nursing roles was mentioned only on one occasion by a medical staff, the nursing team was very vocal about their desire to distinguish between the different medical staff roles, specifically between medical students ('medical clerks') and medical residents (physicians). This is due to the fact that medical students cannot legally prescribe, or take decisions regarding patient care, and therefore nurses must obtain sign-off on orders for their patients from the residents or attending physicians on the team. One nurse was adamant that while other aspects of clinician anonymity bothered her, the

---

[4] The foundational knowledge base of RNs and RPNs is different as a result of differences in basic nursing education. RNs study for a longer period of time, allowing for greater depth and breadth of foundational knowledge in the areas of clinical practice, decision-making, critical thinking, leadership, research utilization and resource management. The autonomy of RPNs is influenced by the complexity of the patient's condition; as patient complexity increases, there is a corresponding increase in the need for RPNs to consult RNs.

lack of ability to distinguish between the roles of the medical team members was most

irritating:

"So really the most important thing for me when talking to somebody is that they

are a doctor. If they are a clerk that's fine, but I'm not carrying out their orders,

as a suggestion that's great but I don't really care what it is, I'm not doing it until

I have a verbal or written order from the doctor. I also like to know who I'm

talking to and what they look like but knowing that they're a doctor versus a clerk

is most important thing to me." [I.31.03.2014.Nurse]

To summarize our findings regarding factors that contribute to the creation of

'clinician anonymity', they can be broadly bucketed into environmental characteristics,

and socio-cultural behaviors. Among the environmental characteristics, the most

influential are the frequent rotations and the limited occurrences of face-to-face

interactions. Among the cultural factors, the lack of introductions, inefficient inter-

professional orientations, and the power dynamic between professions have the strongest

impact on the creation of clinician anonymity. Clinician anonymity is also a direct result

of the fact that physicians hold the ultimate responsibility when it comes to patient care;

this dictates how other collaborative processes and standard procedures are designed on

the ward.

From interviewing different clinical professions the research team gained a

collective view on how things could be improved or what communication would be like

if it were better. The quotes point to clinician's collective theory about preferred form or

quality of communication and to some degree how it might be achieved. As such the

research team argued that there is a design theory and design thinking implicit in the

community which, based on their experience, is worthy of articulating and testing in the form of an intervention. Some of these findings can be more easily operationalized into design requirements, for example increasing the visibility of non-medical staff's names, as names that are more frequently "written-out" on orders are more likely to be remembered. Other factors span a greater scope and would require changes to the medical education system (dealing with frequency of teaching rotations).

The next section highlights how some of the factors that 'create' anonymity in the hospital are also responsible for maintaining it. It is expected that intervening on these factors would have the greatest impact.

How is Clinician Anonymity Sustained?

"Somebody only introduces themselves … if they want something, like when they're in a panic. Half time it's like: are you Andrea, are you Veronica, are you whoever? No! And you know, when they do find the person they're after, they just want something done, they don't really make a point in saying who they are, what team they are, what service they are, what they need." [I.31.03.2014.Nurse]

Some of the same factors contributing to the creation of Clinician Anonymity are also to blame for sustaining it. The study attempted to uncover how and why clinician anonymity is being perpetuated, in order to devise successful tools to help reduce anonymity, which exists among staff. The sustaining factors can be divided into several categories; the following section describes in more detail the findings from observations and staff interviews during the study.

Separation of Work-spaces

The "heart" of the ward, the nursing station[5], is an area separated from patients and dedicated for staff so that they can communicate and consult on issues about patients, place electronic orders, and make the necessary calls and arrangements to ensure proper patient care. Some 'common' areas however are used almost exclusively by physicians. This reduces the potential for inter-professional interaction, both formal and informal.

"When you sit at the table you end up talking more right? ...Everyone is facing the wall in the backroom. I get it, sometimes when I need to do a lot I'll go sit in the backroom so I won't have the distractions or I won't bother someone else either [laugh] I think it's interesting, it's all those little things that reinforce" [I.07.08.2014.SpiritualCareAdvisor]

Observations also confirmed that physicians were given priority to use the computers in the back room, but that those that chose to complete their patients' files at the common table in the nursing station (as opposed to the back room) were more likely to start conversation with other inter-professional staff on the ward.

Work-Arounds

The nature of teaching hospitals not only creates anonymity, but also helps sustain it. As described earlier the large number of patients and amount of work, and the culture of perceived constant urgency results in norms of communication that value efficiency above all. Anonymity is sometimes accepted, even favored, by members of all professions, because of the fast pace that it affords. Below, a PCC did not take the time to

---

[5] The nursing station consists of one larger space with two smaller enclaves at the back [See Figure 5]. The large space has a number of computers around the sides/ edges, and houses a round table in the center where staff often read through the patient's chart and collaborate. One of the back enclaves is set aside for medication administration, and the other enclave houses four additional computers.

elaborate on her role, but rather found it easier and faster to just help with the request

(which was outside her responsibilities), thus not helping staff understand her role. *"The*

problem is that people come up to me and say "are you in-charge today?" ... I don't go

through the whole I'm the PCC, it's more of an administrative role." [I.05.08.2014.PCC]

While it may be difficult to remember 20 new names, one strategy often employed by

staff is to get to know only one, well-connected member and use them as a resource. *"I*

read the name [off the whiteboard] and then I ask Kendra because I know her, then I'll

be like "who's this person" then I'll ask other colleagues to identify who that person is if

I don't know." [I.26.02.2014.SocialWorker] This strategy is sometimes detrimental to the

more approachable and friendlier staff members. One nurse, who happened to be very

sociable, said that, because she gets to know many doctors and they remember her by

name, they tend to call on her for help more often, even when it's not within the scope of

her work and when other staff who is around should be doing this work. While she enjoys

a more familiar relationship, she does feel it creates more work for her.

Staff can also get away with not remembering inter-professional roles of their

colleagues and just "guess" their roles based on the type of clothing they are wearing:

medical team members are dressed business casual, attending physicians usually wear a

white lab coat, while nurses, occupational therapists, physiotherapists and the medical

team that were on-call the previous night are generally wearing blue scrubs.

> *"OT, PT is a little bit easier just because they are wearing scrubs; you can kind*
>
> *of guess who you're talking to. Today somebody was covering for Heather and*
>
> *she was wearing a taco shirt, yeah, so the gist of it comes across so it's not a big*

deal. But it helps because if you come across them on the floor it just helps makes things easier." [I.07.02.2014.JuniorResident]

Another way of identifying staff names or roles without having to remember them, is by trying to see their hospital ID badges. These small (credit card size) badges display the employee's photo, name, and role, but in order to be useful for identification, they need to be facing outward. *"You try to look at their badge and then go note to self I'll remember for the next time….I've seen them looking, doing the same thing I'm doing, hoping that my badge is facing this way [shows]"* [I.05.08.2014.PCC] Another way staff handle clinician anonymity is by simply skipping their names when addressing someone. One staff member will approach another and just start talking about the patient they have in common *"if I don't know their name I'll just say "hey" (there's no name… just) "can I ask you a question?""* [I.05.08.2014.PCC] While team members may sometimes get away with not knowing names, it does not help to build effective relationships among the team.

> *"So I'll skip names if I'm just talking to people but if I need to find someone then, like I know their name is looking after my patient but I don't know who it is then I'll look at the name tags or like I'll go to the unit clerk and be like oh hey do you know who Kendra is? And usually they're not around the nursing station so they page them [giggle] or I'll say is Kendra on break? And hopefully she's not sitting right beside me. I have these strategies but they're not very effective."*
> [I.07.02.2014.JuniorResident]

Some individuals leave entirely the communication entirely up to their other team members. One medical student admitted she was never able to get in touch with an allied health member, but somehow "magically" her messages were being relayed.

> *"I didn't track her down, so I wrote, I guess in bullets when we talked about SLP to see somehow the message got translated and then she would see or he would see, I don't know or my senior would contact them."*

[I.06.03.2014.MedicalStudent]

This often happens when tasks are delegated to other, often subordinate, team members, for example when senior resident assumed that the junior resident is going to somehow get in touch with another staff member.

Electronic Communication

Technology also plays a part in sustaining clinician anonymity. If you can't recognize someone to begin with, and then resort to electronic exchanges, you have less and less an opportunity to put a face to a name. As a staff member reports:

> *"It's super tough to know other clinicians on a more personal, face-to-face level. A lot of our communications with other clinicians and other specialties is obviously through the phone and a lot of it is on a consultancy basis so I don't think I would be able to put a name to a face for most of the consultants that come through unless I met them. If I could improve it, I would definitely have a sit down where you could meet other members and other residents who are doing other sub-specialties; would be super helpful."* [I.07.02.2014.JuniorResident]

The electronic communication through emails does not help either in reducing anonymity, and sometimes is annoying to the non-medical staff who initiates the call. The resident

who replies does not state their name or role, while the nurse needs a specific physician to approve her request.

> *"They don't even tell you who is responding to their email, so if I have further questions I don't even know who to talk to. I need to know who responded to my email because I may go to the wrong person and they'll have no idea what I'm talking about, right? I think it's courtesy; you know to put your name at the end not just okay."* [I.20.02.2014.CACC]

This lack of "signing" correspondence by the medical team members is rooted, as disclosed by physicians, in two different behaviors; first, it is the well-known writing style of physicians: short and to the point, often cryptic, to save time; and second, some residents might still feel unsure about their decisions regarding patient care and, by not signing, avoid taking sole responsibility.

Conclusion

Throughout the design thinking chapter, study findings informed how clinician anonymity is created (factors contributing to the creation of this phenomenon), enacted (observable behavior), sustained (reasons contributing to the maintenance of this behavior), and how this impacts the quality of patient care in hospitals). The voice of the clinicians was brought to the forefront and put into play as a way of interrogating the design thinking of the clinician community. The following table (Table 4) summarizes intervention design requirements based on causal theory implicit in the way the community talks and the normative theory about what is valued. Table 4 identifies the factors that create and/or sustain clinician anonymity and suggest potential intervention requirements.

	Environmental Factors	**Potential Intervention Requirements**
Create / Sustain	**Teaching hospitals** • frequent and non-synchronized staff rotations across all professions • very short time of direct (face-to-face) interactions • large number of members that belong the "circle of care" that surrounds a patient • perceived importance for speed, urgency, and high efficiency manifested in these teaching hospitals	This is a given context. • Change medical school policies (for educational rotations) • Increase opportunity for face-to-face interactions
Create	**Teams and Wards**	Discuss pros and cons and recommend changes
Sustain	**Separation of Work-spaces**	Discuss pros and cons and recommend changes
	Socio-Cultural Factors	**Potential Intervention Requirements**
Create	**Formal Introductions and Inter-professional Orientations**	Practice formal introductions and well-designed orientations
Create	**The role model of Attending Physicians**	Change behavior through education
Create	**Power Dynamic between Professions**	Change behavior through education
Create	**Shielding differences between similar professions**	Discuss pros and cons of the practice of shielding difference and recommend changes
Sustain	**Electronic Communication**	Create standards for identification of messages in electronic communication

Table 4: Factors creating and sustaining clinician anonymity and potential design intervention requirements

Proposing Requirements for Intervention Design

Before proposing the 'would be ideal' solutions for the hospital context, the research team reviewed what had been tried before, to assess if they could distill a practical approach in the present setting. In the following paragraphs, previous interventions that attempted to ameliorate the problem of anonymity are discussed, followed by a proposed design for a new intervention to address each of the aspects in the model of clinician anonymity, where design science is applied as a method of implementation.

As a short recap, the framework that defines clinician anonymity distinguishes between six identifying practices that affect the quality of anonymous communication, four of which partially map to Marx's (1999) identity types and somewhat overlap with Scott's (1998) dimensions of anonymity. Two additional types were identified and

discussed to some extent in the literature on team "familiarity". While *source specification*, and *locatability* are both recognized aspects of anonymity in existing models, and do carry an importance inside the hospital context, they are outside the scope of the current study. However, it serves to make note that various technological tools (artifacts) have been created to help reduce confusion about physical anonymity; for example the introduction of overhead paging, alpha-numeric pagers, and electronic communication systems. In contrast, types of identification that relate to *pseudonimity* are not applicable to clinician anonymity.

The following are existing interventions that have been introduced in the GIM wards of this hospital, or in other organizations, with varying degrees of success. *Identification tags* are required for all individuals working or volunteering in the hospital. These tags display a photo, the name, and staff's role; however they are small and many times flipped over, not at all visible. *Scripted introductions*, was an example of an attempt at reducing anonymity regarding both name and professional role, but the intervention could not be sustained past the research phase (Reeves et al., 2007). A *photo board* displaying photos and names of the nurses, allied health members, and attending physicians is posted up in the department's hallway, with the aim of reducing visual and name anonymity; however this board is outdated, does not include all nurses, and due to the difficulties in keeping up with medical teams rotations, does not include med students or residents at all, in spite of this group exhibiting the greatest degree of anonymity among all the professional groups. It was also static in nature, requiring staff be to a specific location where the board was hung; however often times enactments of

anonymity are observed in the nursing station or in meeting rooms where inter-professional interaction actually takes place.

Two other interventions were introduced on the GIM wards in a partner hospital with the goal of decreasing anonymity related to professional grouping: *distinctive lanyards*, and *distinctive scrubs*. Both these interventions had medical team members identified by their team's colour code. Additionally, the lanyards and scrubs also displayed in large bold font the corresponding team ID (e.g. Team 6). The coloured scrubs initiative was not continued perhaps due to the added cost. The lanyards are still being used and as reported in interviews with staff, they were greatly appreciated as a way to help decrease clinician anonymity.

In order to increase the rotating medical team knowledge about each AH specific profession's roles and responsibilities, the GIM ward has organized brief "*inter-professional orientations*" scheduled to occur within the first days of every new medical rotation. However, when interviewing staff, it was revealed that many allied health members who were supposed to introduce themselves and to describe their roles, did not attend these special orientations, usually delegating an AH representative (e.g. the PT) to explain several AH professions (OT, PT, Dietician, CCAC, etc.), and that the medical students did not think there was sufficient time allotted to explaining the roles and meeting the AH members to get familiar with them. Hayes (2013) also suggests introducing *brief Q&A period* (Hayes, 2013) to help staff familiarize with each other's responsibilities. This same Q&A period also serves to familiarize individuals with the level of expertise that each member has in their respective roles (skill level anonymity) and can help differentiate between medical students and residents etc.

Ideal solution options are often simple interventions that can be successful if carried out properly; for example simply displaying the necessary information in a manner that is easy to read and is ubiquitous at the same time. The following table (Table 5: Clinician Anonymity Interventions) lists the types of interventions that could resolve the problems related to each of the anonymity types in this model. Described are what would be *ideal* interventions, alongside examples of previously tried interventions, and the interventions proposed in this study as *practical solutions* (design requirements) which can be successfully implemented in the hospital context given the findings of this study.