

Patient Handoffs between Emergency Department and Inpatient
Physicians: A Qualitative Study to Inform Standardization of Practice
and Organization Theory

by

Phillip Brian Hilligoss

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Information)
in the University of Michigan
2011

Doctoral Committee:

Professor Michael D. Cohen, Chair
Professor Sanjay K. Saint
Professor Karl E. Weick
Assistant Professor Kai Zheng

© Phillip Brian Hilligoss
2011

This dissertation is dedicated to the memory of my grandfather, James Jaqua, who, lacking the privilege of a higher education nevertheless inspired in me a deep love of learning and remains one of the smartest men I have ever known.

Acknowledgements

There is nothing better than the encouragement of a good friend.
—Jean Jacques Rousseau

The Oxford English Dictionary defines encourage this way: “*to inspire with courage, animate, inspirit.*” What I like about this definition is its emphasis on the effect produced in another by the act of encouraging. I am glad for a chance to acknowledge the inspiring, inspiriting, and animating effects that many have had on me.

I have benefited greatly from the advice and help of my four committee members, all of whom have taken an interest not only in my research but also in my career beyond the dissertation. Kai Zheng provided essential health informatics expertise and helped me make valuable connections that moved this work forward. Sanjay Saint, a professor and a physician, played an important role in reminding me that my work has practical application and in nudging me to give more thought to how I can help improve the safety and quality of healthcare. Karl Weick is an extraordinary thinker and a marvelous teacher who has inspired me in and out of the classroom. His work informs much of what I have done here. I am honored to count him among my mentors.

Michael Cohen is the reason I study organizing in general and healthcare in particular. When he was first embarking on his own study of handoff, I expressed curiosity, and he invited me along for what has been a deeply satisfying adventure. I cannot possibly imagine a better mentor. For nearly five years now he has not ceased to inspire and encourage me. Many were the times when he had more confidence in me than I had in

myself. Never once did I leave his office feeling anything other than hopeful and positive. Overwhelmed at times, yes, but always renewed and invigorated. Inspired. He has always treated me with the respect of a colleague and the kindness of a caring friend, and my work is richer for it.

It has been my fortune to be surrounded by many talented peers at Michigan whose influence has helped at various stages. Within the School of Information (SI) Xiaomu Zhou, Jude Yew, and Archer Batcheller have all been wonderful office mates. I have also benefited from the feedback and friendships of the former “Bleary Theorists”: Eric Cook, Libby Hemphill, Emilee Radar, Rick Walsh, Jina Huh, Yong-mi Kim, Beth St. Jean, Jude, and Xiaomu.

Beyond SI, Marlys Christianson was an invaluable peer-mentor. Always willing to meet for coffee—although she drank tea—she shared freely with me her lessons learned pursuing similar work a year or two ahead of me.

I feel particularly grateful to have been a part of a close-knit interdisciplinary group of doctoral students from across campus engaged in qualitative research. The core members of that group were instrumental in my development as a qualitative researcher and were always a delight to be with: Nancy Baum, Haijing Dai, Brian Girard, Pilar Horner, Airong Luo, Carla Pfeffer, Maria Souden, Jeannie Thrall, and Katherine Luke who left us when she was far too young.

I would also like to acknowledge the support of the staff and administration of the School of Information. So many were helpful in various ways, but I must acknowledge Becky O’Brien by name. Without her help I do not know how I would have finished the AHRQ grant application.

I am indebted to several generous funders who believed in the promise of this work and helped make it possible. The University of Michigan Rackham School of Graduate Studies gave me a research grant when I was first embarking on my field work. ProQuest

supported me one summer with a Dissertation Writing Award. And the US Agency for Healthcare Research and Quality awarded me a Health Services Research Dissertation Grant¹.

I gratefully acknowledge the incredibly dedicated and talented men and women of “Memorial Hospital,” clinicians and administrators alike, who opened doors and warmly welcomed me into their worlds. They gave generously of their valuable time, shared candidly from their inner thoughts, and tolerated patiently my presence and incessant questions. In the interest of confidentiality, I cannot mention any of them by name, but I gladly acknowledge that there is no possible way I could have accomplished this work without them.

I am grateful for the love and support of my wonderful family and for friends who helped keep me sane and connected to life outside of academia. Above all, I acknowledge that without the encouragement, love and tireless support of my partner Dave, I might never have finished this project.

¹ This project was supported by grant number R36HS018758 from the Agency for Healthcare Research and Quality. The content is solely the responsibility of the author and does not necessarily represent the official views of the Agency for Healthcare Research and Quality or of other funders.

Table of Contents

Dedication	ii
Acknowledgements	iii
List of Tables	x
Abstract	xi
Chapter 1 Introduction	1
1.1 Research Problems.....	3
1.2 Statement of Purpose and Research Questions.....	4
1.3 Organization of Dissertation	5
Chapter 2 Literature Review: Handoffs as Multi-functional Situated Routines	7
2.1 Introduction and Conceptual Framework.....	7
2.1.1 Growing Interest and Pressures to Standardize	9
2.1.2 Organization Theory as a Lens.....	11
2.2 Definition, Scope and Method.....	14
2.2.1 Methods	18
2.3 Admission Handoffs.....	20
2.4 Multi-Functionality.....	22
2.4.1 Information Transfer.....	23
2.4.2 Responsibility and Control.....	24
2.4.3 Resilience	25
2.4.4 Co-constructing Shared Mental Models.....	27
2.4.5 Learning.....	30
2.4.6 Summary.....	33
2.5 Situatedness	34
2.5.1 Divisions of Labor	35
2.5.2 Social Structures.....	38
2.5.3 Temporal Structures.....	40
2.5.4 Technological and Environmental Structures	42
2.5.5 Summary.....	43

2.6	Standardizing: The Main Approach to Handoff Improvement.....	44
2.7	Implications.....	47
2.7.1	Multi-Functionality.....	48
2.7.2	Situatedness	50
2.7.3	Interaction of Multi-Functionality and Situatedness	52
2.7.4	Handoffs as Recurring Patterns of Organizational Action	54
2.7.5	Approaches and Methods	55
2.8	Conclusion.....	56
Chapter 3 Research Design and Methods		58
3.1	Rationale for Research Design.....	58
3.1.1	Epistemology and Theoretical Perspective.....	59
3.1.2	Methodology	62
3.2	Research Sample	63
3.2.1	The Study Site.....	63
3.2.2	Participants	69
3.3	Data Collection	71
3.3.1	Semi-structured Interviews.....	72
3.3.2	Observations	74
3.3.3	Recorded Handoff Conversations.....	77
3.3.4	Clinical Documentation	78
3.4	Data Analysis	79
3.4.1	Immersion.....	80
3.4.2	Coding.....	81
3.4.3	Memo Writing.....	83
3.5	Evaluation Considerations	84
3.6	Conventions Used in Presenting Data	85
Chapter 4 Constructing Understandings of Patients: Beyond Information Transfer. 87		
4.1	Introduction	87
4.2	Building Blocks of an Understanding	96
4.2.1	Illness Trajectory	97
4.2.2	Baseline	101
4.2.3	Care Trajectory	105
4.2.4	Rationale.....	109
4.2.5	Summary.....	112
4.3	Electronic Health Records and Chart Biopsies	113
4.3.1	The EHR	116

4.3.2	Information Seeking during Chart Biopsy	124
4.3.3	Information Encountering.....	128
4.3.4	Variations in the Practice of Chart Biopsy	129
4.3.5	Consequences of Chart Biopsies	131
4.3.6	Summary.....	133
4.4	Constructing as Action.....	133
4.4.1	Developing a Differential Diagnosis	138
4.4.2	Understanding to Inform Action.....	140
4.4.3	Summary.....	142
4.5	Discussion	142
4.5.1	Implications.....	145
4.6	Conclusion.....	146
Chapter 5 Negotiating Entangled Ambiguities: Handoff as Situated Interaction		148
5.1	Introduction	148
5.2	Negotiations in Handoff: Selling and Pushing Back.....	149
5.2.1	Entangled Ambiguities.....	152
5.2.2	Selling.....	155
5.2.3	Pushing Back.....	167
5.2.4	Summary of Negotiations in Handoff	177
5.3	Presenting Patients	178
5.3.1	Filtering.....	180
5.3.2	Sequencing Information.....	184
5.3.3	Accentuating	185
5.3.4	Summarizing.....	187
5.3.5	Crafting Language	191
5.3.6	Summary of Presenting Patients	196
5.4	Discussion	196
5.4.1	Implications.....	198
5.5	Conclusion.....	202
Chapter 6 Re-enacting Boundaries: Handoffs and Divisions of Labor		204
6.1	Introduction	204
6.2	Presuming Boundaries	208
6.2.1	Disagreements over level of acuity.....	209
6.2.2	Disagreements Over Main Problem.....	218
6.2.3	Summary.....	226
6.3	Maintaining Boundaries.....	226

6.3.1	Invoking and Interpreting Policies	228
6.3.2	Keeping up with Temporal Rhythms	231
6.3.3	Diagnosing in the ED.....	235
6.3.4	Summary.....	239
6.4	Discussion	240
6.4.1	Contributions.....	243
6.4.2	Implications.....	245
6.5	Conclusion.....	246
Chapter 7 Conclusion		248
7.1	Contributions.....	248
7.2	Implications.....	252
7.3	Limitations and Future Work	254
References		257

List of Tables

Table 3.1 Participants	69
Table 3.2 Data Collection Efforts by Participation	71
Table 3.3 Interview Participation	73
Table 3.4 Observations Participation	75

Abstract

This dissertation is motivated by two problems. First, existing literature characterizes patient handoff as an information transfer activity in which safety and quality are compromised by practice variation. This has prompted a movement to standardize practice. However, existing research has not closely examined how practice variations may be responses to situational and organizational factors or evidence of involved parties accomplishing important functions beyond information transfer. Consequently, standardization efforts run at least two risks: overlooking opportunities for improvement, and engendering negative unintended consequences. Second, despite the fact that roughly 50% of all hospitalized patients are handed off from emergency departments to inpatient units, such handoffs are significantly understudied.

I conducted a two-year ethnographic study of handoffs occurring between Emergency Department and General Medicine physicians when patients were admitted to one highly-specialized tertiary referral, teaching hospital. Using theoretical sampling informed by a Grounded Theory methodology, I conducted observations (n=349 hours) and semi-structured interviews (n=48) and recorded handoff conversations (n=48). I analyzed data by means of immersion, various qualitative coding approaches, and memo writing.

Findings are organized in three chapters. First, I challenge the dominant model of handoff as information transfer by demonstrating that physicians actively construct understandings of their patients, over time, as they encounter, interpret, assemble, and reassemble information through socially-interactive processes within particular contexts and situations. Consequently, multiple understandings of a single patient are not only

possible but likely. Second, I characterize admission handoffs as negotiations, situated by entangled webs of motives and concerns which produce ambiguities. Involved parties must navigate these ambiguities as they develop their differing understandings of patients, resolve conflicts over approaches to care, and agree regarding additional work. Third, I show that boundaries between units are ongoing, effortful accomplishments, re-enacted through interactive negotiations. Over time these negotiations have the potential to shift boundaries and alter the divisions of labor in the hospital, with potential consequences for organizational outcomes. Recommendations for practical improvements and further research are presented.

Chapter 1

Introduction

Communication and coordination are crucial activities in the organization and delivery of high quality, safe, effective, and efficient healthcare. Yet there is much room for improvement. For example, between 1995 and 2004, 66% of all identified sentinel events² had communication as a root cause—more than any other root cause identified (Joint Commission, 2005). Although as a category of root causes, “communication” is a vague, diagnostically unproductive label (Patterson, 2008b; Patterson & Wears, 2009); nevertheless, the statistic is concerning. Consider, too, that during an average hospital stay, patients admitted for a medical issue are cared for by almost 18 different clinicians on average and patients admitted for surgery are cared for by more than 26 clinicians on average (Whitt et al., 2007). Considerable effort is required to ensure that the actions of these many different professionals are coordinated to provide safe, high quality care that is also efficient. Taken together these studies suggest a need to understand and improve communication and coordination in healthcare.

One frequently repeated and highly important clinical communication and coordination activity is the patient handoff: “the exchange between health professionals of information about a patient accompanying either a transfer of control over, or of responsibility for, the patient” (Cohen & Hilligoss, 2010, p. 494). Handoffs may be *within-*

² The Joint Commission defines a sentinel event as “...any unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injuries specifically include a loss of limb or function. The phrase “or the risk thereof” includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome” (Joint Commission, 2011, p. 1).

unit, as when providers in the same hospital service hand off at shift or rotation change, or *between-unit*, as when a patient is moved from one unit of the hospital to another or between institutions. A variety of clinical hospital personnel engage in handoff, including physicians, nurses, and technicians.

In recent years, many have grown increasingly concerned that handoffs may compromise patient safety (Beach et al., 2003; Jagsi et al., 2005; O'Byrne et al., 2008) and negatively impact quality of care (Behara et al., 2005; British Medical Association et al., 2005; Horwitz, Parwani et al., 2009). Handoffs have even been heavily implicated in malpractice suits (Singh et al., 2007). These concerns have prompted a movement to standardize handoff practices (British Medical Association et al., 2005; Joint Commission, 2006a; Pillow, 2007; World Health Organization & Joint Commission, 2007). However, we lack of a solid evidentiary basis to demonstrate the effects of poor handoff or the benefits of standardization (Cohen & Hilligoss, 2010). Further research is needed, including that which deepens our understanding of handoff practice.

In this dissertation I examine the multi-functional, situated nature of between-unit handoffs involving Emergency Department (ED) and General Medicine physicians in one highly specialized tertiary referral, teaching hospital. By *multi-functional* I mean that multiple purposes may be accomplished simultaneously during handoff. By *situated* I mean that the actions of handoff are dynamic, emergent, and adapted to context.

In the next section I identify several related problems that existing research has not adequately addressed. Then, I provide the statement of purpose and research questions on which my dissertation is focused. I conclude with a brief overview of the structure of this dissertation.

1.1 Research Problems

Existing literature characterizes handoff as an information transfer activity in which safety and quality are compromised by variations in practice (Borowitz et al., 2008; British Medical Association et al., 2005; Nagpal et al., 2010; Pillow, 2007; Raptis et al., 2009). This characterization leads to interventions that favor standardizing handoff practice by structuring the content provided by the party handing off the patient (J. Anderson et al., 2010; Haig et al., 2006; Salerno et al., 2009; Wayne et al., 2008). But, handoffs are often multi-functional conversations (Behara et al., 2005; Patterson, 2008b), accomplished in particular situational and organizational contexts (Shojania et al., 2006; Solet et al., 2005; Sutcliffe et al., 2004), involving clinicians of varying experience and expertise (Apker et al., 2007; V. Arora et al., 2005) and patients which are also variable. Existing research has not closely examined how practice variations may be responses to a number of situational and organizational factors; therefore, we cannot easily distinguish between variety that is unnecessary or undesirable and variation that is necessary or desirable. Lacking a good understanding of the multi-functional, situated nature of handoffs, we run at least two risks: we may overlook opportunities for improvement; and the standardizations we attempt may engender negative unintended consequences.

One promising approach is to conceptualize handoff not merely as an information transfer activity, but also as a social interaction in which an understanding of the patient is co-constructed by the parties involved. Although a few studies (Behara et al., 2005; Bruce & Suserud, 2005; Eisenberg et al., 2005; I. James et al., 2010) have begun to demonstrate the usefulness of this perspective, there remains a need to explicate the processes involved in constructing understandings of patients.

Furthermore, although roughly 50% of all hospital admissions in the U.S. involve a handoff between personnel in the Emergency Department (ED) and an inpatient service

(Jiang et al., 2000), there exists very little research focused on the coordination involved in this crucial transition (notable exceptions include, Apker et al., 2007; Benham-Hutchins & Effken, 2010; Horwitz, Meredith et al., 2009; Horwitz, Parwani et al., 2009). As between-unit coordination activities, admission handoffs³ necessarily involve challenges beyond those faced by within-unit handoffs. For example, one brief paper suggests that negotiation may play an important part in admitting patients through the EDs of large tertiary referral, teaching hospitals (Nugus et al., 2009). Similarly, we might expect admission handoffs to entail considerable boundary work, given that they involve coordination across divisions of labor. Boundary work has been shown to involve unique challenges in other activities in healthcare (Allen, 2002; Barley, 1986; Mizrachi et al., 2005; Strauss et al., 1963) and in other industries (Bechky, 2003; Lamont & Molnar, 2002; Star & Griesemer, 1989), but we do not have a full understanding of how organizational boundaries produced in the division of labor figure in admission handoffs.

With these gaps in mind, I turn now to the statement of purpose and research questions I pursue in this dissertation.

1.2 Statement of Purpose and Research Questions

The purpose of this ethnographic study is to provide insights into handoff practice variety by developing grounded theory of admission handoffs between Emergency Department and General Medicine physicians. Through careful examination of admission handoffs in one tertiary referral, teaching hospital, it is my intent to provide a rich characterization of the multi-functional, situated nature of handoff and to suggest avenues for improvement of practice and further research.

To accomplish this purpose, I address the following central research question:

³ I use the term “admission handoff” to refer to a handoff that occurs when a patient is being admitted to an inpatient service of the hospital from the ED.

1. How might variations in the practice of admission handoff between Emergency Department and General Medicine physicians be explained by the multi-functional, situated nature of handoff?

Additional, related questions I consider are:

2. How do physicians come to have particular understandings of their patients, and of what are these understandings comprised?
3. How are admission handoff negotiations accomplished?
4. How do organizational boundaries figure in the interactions of admission handoff?

To answer these research questions, I conducted an ethnographic study between January 2009 and March 2011 in a highly-specialized tertiary referral teaching and research hospital in the Midwestern United States. Using semi-structured interviews and observations of attending and resident physicians in the ED and General Internal Medicine services, as well as transcribed recorded handoff conversations between such physicians, I developed a grounded theory of admission handoffs with implications for both practice improvement and further research.

1.3 Organization of Dissertation

In this chapter, I have provided an overview of the topic of patient handoff and have briefly identified the need for research that examines the multi-functional, situated character of such transitions. I have also stated my research purpose and questions and indicated how I address those questions. In Chapter 2, I provide an extensive review of the handoff literature using an organization theory lens. In Chapter 3, I introduce my research design, including the epistemology, theoretical perspective, methodology, and methods I use in this dissertation. I also provide information about my study site and sample. In Chapters 4, 5, and 6 I present and discuss my findings. Chapter 4 explores the processes of

constructing an understanding of a patient, including demonstrating how electronic health records are used in these processes and may be changing the nature of handoff interactions. In Chapter 5, I examine the negotiations of admission handoff, explaining how interactions become situated by an entangled web of concerns and motivations, producing ambiguities that must be interpreted in context. In Chapter 6, I demonstrate that the boundaries between hospital units are not fixed, but are flexible, contested, presumed, negotiated and re-enacted through ongoing interactive processes, including admission handoffs. I conclude with a summary of my contributions in Chapter 7.

Chapter 2

Literature Review:

Handoffs as Multi-functional Situated Routines⁴

2.1 Introduction and Conceptual Framework

As a patient moves among specialized services within a hospital, and as shifts of medical personnel come and go, there are numerous episodes in which control of, or responsibility for the patient passes from one health care professional to another, and in which important information about the patient is also exchanged. These transitions, which we collectively label 'handoffs,' are crucial moments of coordination with potential consequences for the safety of individual patients. Indeed, concerns that care transitions may contribute to adverse events (Beach et al., 2003; Jagsi et al., 2005; O'Byrne et al., 2008) and negatively impact quality of care (Behara et al., 2005; British Medical Association et al., 2005) have given rise to pressures to standardize handoffs (Dhingra et al., 2010; Joint Commission, 2006a; World Health Organization & Joint Commission, 2007) and ignited a significant growth in research on patient handoffs. In this paper we review that research using an organization theory lens to provide a new perspective on the nature and consequences of handoffs in hospitals.

Others have reviewed the handoff literature (e.g., V. M. Arora et al., 2009; Friesen et al., 2008; Miller, 1998; Patterson & Wears, 2010; Riesenber et al., 2010; Riesenber, Leitzsch, & Little, 2009; Riesenber, Leitzsch, Massucci et al., 2009; Strople & Ottani, 2006),

⁴ This chapter consists almost entirely of a manuscript I co-wrote, serving as lead author, with Michael D. Cohen. I have therefore retained the use of first person plural pronouns.

but the review presented here is one of the most extensive and the first to use an organization theory lens to examine what is known about handoffs and to identify promising future paths for research and improvement. We bring theory to bear on the practical problem of handoff because handoffs are organizational routines, frequently repeated coordination activities that are consequential for organizational outcomes important to hospitals. Organization theory can identify potential problems with current standardization efforts and suggest other fruitful avenues for change initiatives and research efforts. Theory is useful for understanding the particulars of micro-level activities in their larger structural contexts; for alerting us to possible side-effects of interventions and to other tradeoffs to consider; and for examining the underlying assumptions, models and metaphors that guide our thinking and actions with respect to the phenomena we examine.

We do not attempt to address the many intricate details of each issue relevant to the practice of handoff. Elsewhere we have provided a more extensive discussion of such details aimed at practitioners⁵. Rather we have undertaken this review in service to two audiences: researchers who study the organization or management of health care, and hospital policy makers who manage the delivery of health care services. Thus, we assume that although many of our readers will know much about the day-to-day activities of health care professionals, their interest here will be in larger organizational issues involved in handoff. Our intent, therefore, is to examine the ways that handoff affects organizational processes; how the structure of the organization impacts handoff; and how the routine nature of handoff shapes it and constrains the possibilities for change.

⁵ The extensive summary is available via <http://deepblue.lib.umich.edu/handle/2027.42/61522>.

2.1.1 Growing Interest and Pressures to Standardize

Interest in handoffs has grown considerably in recent years as a result of several converging factors, including concern over the role of communication errors in adverse events, resident work hour reforms, and regulatory pressures to standardize handoff practices. One frequently referenced study is the Joint Commission (2006b) report of sentinel events, which makes a compelling case for the connection between patient safety and communication practices. The report identifies communication issues as a root cause in 66% of all sentinel events in hospitals and health care institutions in the United States. Other root causes such as training, patient assessment, staffing, and competency were implicated in numerous sentinel events, but no cause was associated with more problems than communication. As Patterson (2008b; Patterson & Wears, 2009) has noted, however, the category “communication” is too broad and, like the catch-all “human error” in other safety domains, runs the risk of being diagnostically unproductive. Additionally, the general term “communication” may have contributed to a simplistic model of handoff as information transmission that seems to underpin many improvement efforts reported in the research. We take this matter up in greater detail below in the section on the multifunctionality of handoffs.

Another factor contributing to the rising concern over handoffs was the change made in 2002 by the Accreditation Council on Graduate Medical Education (ACGME) in rules governing resident work hours. Similar reforms have been instantiated elsewhere, including the Working Time Directive in the European Union. These rules forced many institutions to shorten resident work periods. This effectively increased the number of handoffs, and thus the potential for increased communication problems and reduced continuity of care (e.g., Fischer, 2004; Fletcher et al., 2004; Fletcher et al., 2005; Horwitz et al., 2006; Hutter et al., 2006); however there is some evidence that reduction in resident

work periods does not negatively impact patient care (Howard et al., 2004; Kaafarani et al., 2004; Kort et al., 2004) and may reduce error rates (Landrigan et al., 2004). Recent recommendations for further reductions in duty hours (Ulmer et al., 2008) suggest that handoffs will likely only increase in number and significance. We take up the matter of shift schedules and other organizational structure below in the section on the situatedness of handoff.

One of the most influential factors stimulating growth in research on handoffs has been pressure from regulatory bodies and professional associations to standardize handoff communication practices (Australian Healthcare & Hospitals Association, 2009; Australian Medical Association, 2006; British Medical Association et al., 2005; Garling, 2008; Joint Commission, 2006a; World Health Organization & Joint Commission, 2007). In the US, a 2006 National Patient Safety Goal required hospitals to "*Implement a standardized approach to 'hand off' communications, including an opportunity to ask and respond to questions*" (Joint Commission, 2006a).

More recently in an effort to reduce the burden of its regulatory requirements (Joint Commission, 2009a, 2010c), the Joint Commission moved handoff communication from being a National Patient Safety Goal (NPSG) to being a Provision of Care (PC) standard with associated Elements of Performance (EPs).

Standard PC.02.02.01: The hospital coordinates the patient's care, treatment, and services based on the patient's needs.

EP 1. The hospital has a process to receive or share patient information when the patient is referred to other internal or external providers of care, treatment, and services.

EP 2. The hospital coordinates the patient's care, treatment, and services. Note: Coordination involves resolving scheduling conflicts and duplication of care, treatment, and services (Joint Commission, p. 13).

The new standard is quite general and may reflect what Joint Commission surveyors accepted as compliance with the earlier standardization requirement (i.e., NPSG 02.05.01 or

2E), when reported compliance levels reached as high as 99% in 2008 (Joint Commission, 2009b).

The resulting situation is that international attention has been called to handoffs as a potential point of vulnerability in hospital processes. Hospitals have been told to have a policy, but left to decide for themselves what its contents should be. The Joint Commission informally recommends the SBAR protocol (discussed below in the section on standardizing) as an acceptable approach (Joint Commission, 2010b; World Health Organization & Joint Commission, 2007); however, it provides no evidentiary basis for this recommendation. The problem remains: what are hospitals to do on behalf of the safety of their patients?

2.1.2 Organization Theory as a Lens

Wherever there is division of labor, whether by specialized skills and knowledge, by temporal arrangements, such as shift schedules, or by any other organizational differentiation, there will be a need to coordinate across the boundaries that emerge from these divisions (Crowston, 1997; Gittel, 2002; Weick, 1979). While such divisions of labor can improve the productivity and expand the capabilities of the organization (March & Simon, 1993), coordination “costs” place limits on the extent to which the organization can subdivide labor and continue to function effectively and efficiently (Becker & Murphy, 1992). Responsibility for, or control of, patients must be transitioned from one health care provider to another or from one hospital service to another because hospitals operate continuously and provide a wide variety of treatment and diagnostic services. As medicine becomes increasingly specialized and as new technologies, treatments and therapies become available, additional divisions of labor emerge within the hospital necessitating an increasing number of handoffs. Furthermore, this increasing specialization and subdividing of labor increases the already-complex nature of the health care system. Altering structures

or patterns of interaction in one part of a complex adaptive system will have consequences, often unanticipated, for other parts of the system (P. Anderson, 1999; Axelrod & Cohen, 1999; McDaniel & Driebe, 2001). Approaches to improvement that attempt to “reduce and resolve” problems, isolating a single part of the system without considering how it is interconnected to other parts, are often not appropriate for the multi-disciplinary, interdependent modern health care delivery system (Plsek & Greenhalgh, 2001). There is a need for research that examines how micro patterns of activity in handoff and the interventions to improve them are embedded in, shaped by, and ultimately produce effects on the larger system of hospital activities and outcomes.

Because they are action patterns frequently repeated in similar circumstances, handoffs become routines (Cohen et al., 1996; Smith & Mishra, 2010), grounded in human memory for habits (Fu & Anderson, 2006; Squire & Kandel, 1999). Routines are fundamental building blocks of activity that enable an organization to respond to recurring situations somewhat automatically, and in a coordinated and adaptable manner (Nelson & Winter, 1982). This capability is central to the efficiency and stability of an organization (March & Simon, 1993) and to its persistence over time in the face of changing personnel (Birnholtz et al., 2007). Likewise, routines are durable, stable and can be resistant to change (M. S. Feldman, 2003; Nelson & Winter, 1982). But recurring organizational activities can also be important sources of endogenous change (Feldman & Pentland, 2003), as organizations learn, flexibly adapt, and embed knowledge in routines (Argote, 1999; Levitt & March, 1988).

Routines are highly subject to context (Cohen et al., 1996; Feldman & Rafaeli, 2002; Orlikowski, 2002). As contexts and situations change, routines must frequently be adapted if efficient and effective functioning is to be maintained. In fact, the automatic quality of routine action that enables efficiency can at times produce sub-optimal results when

significantly novel circumstances are not detected and routines are triggered somewhat mindlessly (Cohen & Bacdayan, 1994; Egidio & Narduzzo, 1997). Often adaptation to the situation must happen during the performance of the routine as a variable mix of organizational actors with a varying mix of goals must communicate and interrelate (Feldman & Rafaeli, 2002; Howard-Grenville, 2005; Weick & Roberts, 1993). As a result, organizational routines may necessarily involve both mindful and less-mindful forms of action (Levinthal & Rerup, 2006).

The context-dependency of routines calls to mind the concept of “affordances,” which Gibson (1979) developed to refer to the possibilities which an environment offers an animal. For example flat, rigid, broad terrains afford standing, walking and running by certain species such as dogs and humans, but not by others, such as fish. Thus, affordances are not entirely fixed properties of the environment itself, but are relative to the particular animal. Others have applied the concept of affordances to technologies and manmade environments (Gaver, 1991; Norman, 1994). The concept can be extended further, noting that different situations afford particular kinds of actions and interactions while limiting or preventing others. Furthermore, because the capabilities, perceptions, and social positions of individuals vary, the actions a given situation affords one person may differ from the actions afforded to someone else. To some extent, we can understand the affordance of situations by considering the interplay of agency and structure. Structure enables and constrains agency; agency perpetuates or alters structure (Giddens, 1984). Each instantiation of a routine is a situated instance of this recursive, mutually constitutive interaction between agency and structure (Barley, 1986; Orlikowski, 1996, 2000). It is what people can do (or perceive they can do) in a given enactment of the routine.

Viewing handoffs as organizational routines, performed within dynamic situations that afford some actions while hindering others, provides new insights into these

coordination activities and reveals important lessons for those engaged in managing or studying them. For example, theory of organizational routines suggests that handoffs may serve many important functions beyond safety and quality and may contribute to long-term organizational outcomes. Likewise, theory of routines directs our attention to the role that context and situation play in handoff, and it suggests that a tension may exist between the automaticity that enables efficient responses to recurring events and the mindful interaction that is often required to adjust those responses to the distinct demands of situation.

With this organization theory perspective in mind, we begin our review by defining the scope of activities subsumed under the label 'handoff' and the methods we used to gather the literature. Next, the literature on admission handoffs between emergency department and inpatient staff is summarized. We then organize our discussion of the relevant research around two characteristics of patient handoffs which we believe to be highly important yet underemphasized in the literature: their multi-functionality and their situatedness. While other perspectives on handoff are possible and useful, we feel that our framework provides new insights and suggests important implications for hospital change initiatives and organizational research efforts. We discuss these implications in the latter half of this review.

2.2 Definition, Scope and Method

The transfers covered in the research reviewed here are known by many names, including 'handoff', 'handover', 'nursing report', and 'sign-out'. The differences among the names also carry some differences in connotation (Philibert & Leach, 2005). Some may emphasize the information content itself (e.g., 'report'), while others (e.g., 'handover') may suggest more strongly the change in control, as for example, when there is a change in the health professional who will be near the patient. Still other labels may connote the change

in responsibility (e.g., 'sign-out'). These distinctions can be consequential. For example, a patient can be handed off, in the sense that a move has occurred to a new location with new proximate personnel, without having been signed out, in the sense that no appropriate person at the new location has accepted formal responsibility for making decisions regarding the patient's care (Behara et al., 2005; Smith et al., 2008).

Our sense is that the exchange of information establishing the patient's state and context is the essential element in all these differently labeled interactions, even if there are variations in the accompanying events and purposes. We have therefore adopted a definition that is broad, and one that puts patient information exchange at its core. Handoffs, as discussed here, are exchanges in which there is a central goal of summarizing the patient's situation in order to significantly shape subsequent treatment and decision-making. We have defined handoff as *the exchange between health professionals of information about a patient accompanying either a transfer of control over, or of responsibility for, the patient* (Cohen & Hilligoss, 2010, p. 494). Where we don't qualify the term, we use 'handoff' in a generalized sense that also includes the range of its near-synonyms, such as 'sign-out' and 'report'.

While we believe that information exchange is a central aspect of handoff, we wish to caution against simplistic models of what is involved in information exchange. Viewing handoff as a primarily one-way transmission of information underestimates the complexity of the cognitive and social processes that are often involved, obscures the role of the receiving party in handoff, and may lead to process interventions that fail to improve transitions of care, perhaps even further complicating or jeopardizing them (Patterson & Wears, 2010; Perry et al., 2008). We take up these issues in greater detail below when we discuss the multi-functionality of handoff.

While it puts information exchange at its core, our definition is also tied to significant changes in responsibility, or control, or both. Without that important added element, 'handoff' would become a label including all forms of information exchange about patients. Case-conference reports (Montgomery Hunter, 1991), consultations (Lee et al., 2008), radiology reports (Pool & Goergen, 2010), and provider-patient communication (Heritage & Maynard, 2006) are all important instances of hospital communication; however they lie outside of the scope of handoff—and thus of this review—as they do not involve changes in the personnel who have responsibility for or control of the patient.

We would also like to introduce a convention that will simplify our text. Since we must frequently refer to the parties of a typical handoff and will often need to distinguish their roles, we will call the party giving up responsibility or control the *handing-off* physician, nurse or technician, and the one(s) assuming control or responsibility the *receiving* party (or parties). We wish to emphasize that by “receiving” party we do not intend to suggest this individual or service is merely the receiver of information about the patient, which would portray handoff as a one-way transfer of information. As we discuss in several places below, such a portrayal is often inaccurate and potentially problematic. Thus, by the term receiving party, we mean the party receiving responsibility for or control of the patient.

Discussions of handoff research and improvement efforts may also gain precision if we keep in mind that handoff, though associated with change in personnel, is nonetheless distinct from it. For example, handoffs usually occur when there are shift changes, but not all the differences in care provided by an oncoming health professional are properly attributed to the handoff that occurred. Other differences in the experience and status of the receiving personnel would play their role even if a handoff could somehow perfectly convey all relevant information about the patient. It is important to keep the logical distinction

clear because evidence about effects of handoffs on patient outcomes can often confound the communication effects of handoff with the effects of other differences: for example, with differences in expertise between the specific personnel involved before and after, or with the effects of the surrounding conditions that changed along with the handoff, such as transition from daytime to nighttime operating modes in a hospital.

The importance of the distinction can be illustrated by looking at the influential and carefully executed study by Petersen et al (1994), the most widely cited evidence on the importance of handoffs. The study showed that *cross-coverage* is associated with increased incidence of preventable adverse events. The authors do not isolate the effects of handoff, nor do they claim to. Nevertheless, the observed increase is often attributed directly to handoffs in the subsequent publications that cite the work. Petersen et al do make an extensive effort to control statistically for some possible alternative sources of the outcome differences, such as time of day, patient comorbidity, demographic characteristics, and severity of illness. The fact remains that they cannot distinguish between effects of cross-coverage and effects of other, unmeasured, differences between the original and cross-covering personnel, or between normal hospital conditions and the conditions, such as high admission load (M. Ong et al., 2007) that may have led to cross-coverage by a physician from outside the team.

There are, of course, other strongly suggestive grounds, including a later study by the same authors, (Petersen et al., 1998) to suppose that handoffs bear part of the responsibility for adverse events. For example, the aforementioned Joint Commission (2006b) report of sentinel events has shown that "communication problems" are implicated in a large majority of adverse events and near-misses. Since handoffs are a regular and major locus of information exchange, it is quite plausible that improving them will contribute to patient well-being, and many of the studies we discuss reference the Joint

Commission data and make this inference. We have undertaken this review because we too believe that handoffs are highly consequential. Nonetheless, our review has not identified any study done so far that can fully distinguish consequences of handoffs per se from consequences of associated factors such as changes in personnel and in surrounding conditions. We believe that improved handoffs should lead to improved results for patients, but they may not reduce other sources of difference in patient outcomes that stem from factors correlated with handoffs.

2.2.1 Methods

We have attempted to identify all research treatments of hospital handoffs involving medical personnel published in English through July 2010 and have also included a few select pieces published after this date. To locate the literature, we searched PubMed using the terms “handoff,” “handover,” “signout,” “sign-out,” “SBAR,” and “shift report.” We also used the reference lists of the papers we located as well as bibliographies compiled by other researchers (e.g., Philibert, 2007) to find additional literature.

We deliberately adopted broad criteria of inclusion. Some items are not systematic studies, but rather material with implications for handoff, such as editorials, interviews, or research on a related topic. The corpus⁶ we have gathered includes more than 640 published items pertaining to patient handoffs. We have produced an extensive summary of this body of research aimed at practitioners and providing extensive citations⁷. Given the organizational and management focus of this present review, we presume the reader will have less need for in-depth discussions of various practice details or to see all citations

⁶ The complete set of identified items, with accompanying short summaries, is available at <http://www.connotea.org/user/signout>. Each item is linked to a full text copy maintained by the authors. Under the fair use provisions of the copyright law, legitimate researchers have a right to access such material and may contact either author for permission to use the full text library.

⁷ See footnote 5.

pertaining to each particular detail. Readers wishing to learn more about a particular aspect of handoff or to locate additional relevant citations are, therefore, referred to the longer summary paper or online bibliography.

For the purposes of this review, we cite only those papers which have proven influential (as evidenced by frequent citations in the literature) or which present a distinct perspective or illustrative example. Our collection includes items dating as far back as 1969, although the overwhelming majority of papers have been published in the last decade—not surprisingly given the recent push for standardization and work hours reforms. We have attempted to cite the most current research and opinions, but have also referenced a few older pieces where these remain among the more influential or articulate on an important issue. Finally, because handoffs are performed by a variety of hospital professionals, we have endeavored to cite a mix of disciplinary perspectives, including a variety of specializations from within the nursing, physician, and other health professions.

From our analysis of the existing research and opinion published on patient handoff, as well as from our own formal and informal observations of practices, we have developed a framework that characterizes handoff as a multi-functional, situated organizational routine. This framework draws attention to aspects of handoff that are currently underemphasized in the research but which can suggest new ways of studying and improving care transitions. Ours is not the only way handoffs may be framed (Patterson & Wears, 2010), but we feel the characterization of handoff provided here is particularly important for organizational researchers and health organization policy makers because it highlights how handoff is enabled and constrained by organizational structure and demonstrates impacts handoff can have on the health care organization beyond the safety of and quality of care provided to individual patients.

2.3 Admission Handoffs

One of the most frequent hospital handoffs is the transfer that occurs when a patient is admitted from the Emergency Department (ED) to an inpatient service—hereafter referred to as the “admission handoff.” With almost 50% of all U.S. hospital admissions arriving through the ED (Jiang et al., 2000), the admission handoff is a critical, highly important mode of hospital entry. However, in spite of its pivotal role, the admission handoff has been the central subject of only a small number of studies (Abraham & Reddy, 2010; Apker et al., 2010; Apker et al., 2007; Benham-Hutchins & Effken, 2010; Horwitz, Meredith et al., 2009; Horwitz, Parwani et al., 2009; Matthews et al., 2002) and a secondary topic of a few others (Behara et al., 2005; Eisenberg et al., 2005). This section provides an overview of four broad challenges of admission handoff: uncertainties of patients, inter-professional differences, negotiations, and inter-relatedness with other organizational activities and concerns.

First, frequently there are uncertainties surrounding patients who pass through emergency departments (Apker et al., 2007; Behara et al., 2005; Christianson, 2009; Horwitz, Meredith et al., 2009). Such patients are often highly vulnerable, at early stages of an acute illness episode when it can be difficult to know the cause of their complaints or the likely future course of their illnesses. Additional uncertainties about patient conditions and ambiguities about responsibility can emerge as a result of pending lab and test results at the time of handoff and the practice of boarding—physically keeping a patient in the ED after handoff, awaiting an available bed (Apker et al., 2007; Horwitz, Meredith et al., 2009).

Second, because they cross organizational boundaries, admission handoffs are challenged by the fact that the parties involved usually have differing professional orientations and perspectives (Abraham & Reddy, 2010; Apker et al., 2007; Horwitz, Meredith et al., 2009). ED physicians tend to be focused on urgent conditions and efforts to

stabilize patients. Internal medicine physicians, on the other hand, tend to be focused on longer term treatment efforts. Sub-specialty internal medicine physicians are focused on single organs or bodily systems, while ED and general internal medicine doctors must attend to the whole body (Nugus & Braithwaite, 2010). These different orientations toward illness and treatment are compounded by some differences in terminology (Nugus et al., 2009) and communication expectations (Apker et al., 2007), and by inter-professional mistrust and stereotyping (Horwitz, Meredith et al., 2009).

Third, another consequence of the boundary-crossing nature of admission handoff is that it can involve negotiations. Whereas a shift sign-out is dictated by the temporal structure of a shift or rotation schedule, an admission handoff is triggered by a decision someone has made or is making regarding the care of the patient. Where a decision is made, there are alternative courses of action. Consequently, someone could take issue with the chosen course. Thus, admission handoffs can be the locus of negotiations over the decision to admit the patient and over the decision to place the patient on a particular service of the hospital (Apker et al., 2010; Apker et al., 2007; Eisenberg et al., 2005; Nugus & Braithwaite, 2010; Nugus et al., 2009). Furthermore, conflicts over placement decisions may be more common in cases of patients with multiple morbidities (Apker et al., 2007).

Finally, the admission handoff conversation is one step in a much larger admissions process (Matthews et al., 2002) and is therefore influenced by other organizational activities. For example, intra-departmental activities such as shift change can interact with and complicate admission handoff (Benham-Hutchins & Effken, 2010), as when incomplete information transfer during shift sign-out results in incomplete information transfer during the subsequent admission handoff. (Eisenberg et al., 2005; Matthews et al., 2002). In addition, the workloads, capacities, shift schedules, and temporal rhythms of different hospital units can differ significantly, and staff in one unit may be unaware of the current

state of another unit (Abraham & Reddy, 2010; Benham-Hutchins & Effken, 2010). And although an admission handoff typically involves the transfer of an individual patient, clinicians in both the ED and inpatient units must balance the needs of that individual with those of other patients on their respective services (Apker et al., 2007).

In sum, admission handoffs between ED and inpatient clinicians are understudied, despite being consequential for large portions of hospitalized patients. Because they happen early in the trajectory of an illness episode when patient diagnoses and prognoses may be unclear; because they involve communication and coordination across organizational boundaries; and because they are embedded in and influenced by a host of other organizational processes and concerns, admission handoffs face unique challenges and may have consequences for safety, quality and efficiency at the individual patient and larger organizational levels. A small number of studies have begun to provide insight, but more research is needed to deepen our understanding of admission handoff.

2.4 Multi-Functionality

As we have noted, attention to handoffs has increased remarkably in recent years largely due to the concern that care transitions threaten patient safety and quality of care. Communication breakdowns, including the failure to transfer accurate, essential information, are at the root of this potential hazard. Accurate information plays a vital role in the continuity of care during times of transition, and we have therefore defined handoff in terms of information exchange. Nevertheless, in our efforts to improve safety and quality, it is important that we also attend to the numerous additional functions that are accomplished during the course of handoff (Behara et al., 2005; Hays, 2003; Lally, 1999; Patterson, 2008b; Sherlock, 1995). However compelling the patient safety issues may be, interventions that fail to consider the full range of functions run the risk of unanticipated

resistance to change or of unanticipated (and perhaps very damaging) side effects as handoff practices are modified (Meltzer & Arora, 2007).

One of the advantages of an organization theory lens is that it broadens our perspective and alerts us to the many functions that handoffs can play. Organizational routines are often multi-functional, and may serve a variable and varying mix of goals simultaneously. For example, we know that beyond whatever immediate actions a routine may accomplish, that routine will likely also play a part in the organization's ability to learn and adapt (Argote, 1999; Feldman & Pentland, 2003), and to remember (Birnholtz et al., 2007; Nelson & Winter, 1982). Furthermore, recurring patterns of coordinated work establish connections across the structures that produce divisions of labor, creating complex, interdependent systems of action (Feldman & Rafaeli, 2002). Intervening in those systems can affect the ability of the organization to coordinate effectively. All of this suggests the need to identify and understand the multiple functions of handoff and to develop conceptual frameworks of handoff that account for multi-functionality. In this section we review the functions of handoff covered in the literature and identify connections to theory that may be useful for expanding our understanding of these functions.

2.4.1 Information Transfer

The transfer of accurate, essential information in the service of ensuring safety is the function of handoff that has received the most attention to date. In addition to finding "communication problems" as the most frequent root cause of sentinel events, the aforementioned Joint Commission (2006b) report also shows "availability of information" to be a root cause in 20% of all sentinel events. As we will argue, handoff frequently involves interactions that are more complex than "information transfer" may suggest.

Nevertheless, the correct transmission of essential information is a core function of handoff that must be achieved.

This function becomes sharply evident in cases where it is not fulfilled (McCann et al., 2007) (Schultz et al., 2007). Studies have implicated handoffs in analyses of near misses and adverse events (e.g., Ebright et al., 2004; Jagsi et al., 2005; O'Byrne et al., 2008) and malpractice claims (Singh et al., 2007). Communication problems at the handoff lead to loss of information or misunderstandings about: care plans (Hinami et al., 2009; Sutcliffe et al., 2004; Ye et al., 2007), medications (V. M. Arora et al., 2007; Institute for Safe Medication Practices, 2005; Wears et al., 2003), patient conditions (V. Arora et al., 2005; Ferran et al., 2008; M. S. Ong & Coiera, 2010), code status (Volpp & Grande, 2003; Wachter & Shojania, 2004), and test results (Beach, 2006; Hanna et al., 2005; Horwitz, Meredith et al., 2009), and can have serious consequences for caregivers as well, including the loss of licensure (Castledine, 2006).

As mentioned, concerns over threats to safety caused by failure to transfer information during handoff have motivated the recent move to standardize handoff communication. Typical solutions involve documents or conversation protocols that attempt to predefine the topics to be covered or the information to be exchanged during handoff. We take up these matters below in the section on standardizing. The overwhelming majority of the reported standardization efforts are based on a view of handoff as an information transfer activity; however as the following sections show, handoff frequently accomplishes many other important functions.

2.4.2 Responsibility and Control

Beyond the exchange of patient information, handoffs frequently signal that a transfer of *responsibility* or *control* has occurred. Even if little information changes hands, it is important to establish who is now responsible for making which decisions on a patient's

behalf. Unclear responsibility for patients can lead, at a minimum, to time-consuming searches for a clinician with requisite authority, and often to patient adverse consequences (Gandhi, 2005; Williams et al., 2007). The term 'sign-out' is sometimes used in transfer situations and strongly suggests that responsibility—often including legal responsibility—has passed to new clinicians. In fact, more than one new sign-out protocol includes the "co-signing" of a transfer document by both participating parties (Mathias, 2006; Propp, 2003), and we have often seen sign-out accompanied by a ceremonial transfer of a key communication device, such as a pager or cell phone assigned to the service rather than to a person. Beyond simple transfer, however, handoffs often require explicit discussions about which responsibilities are being transferred (Smith & Mishra, 2010). For example, discussing who will follow up on outstanding test results (Barbera et al., 1998; Horwitz, Meredith et al., 2009; Horwitz et al., 2008) or the amount of freedom a cross-covering intern will have to provide and select pain medication may help reduce ambiguities that would otherwise emerge where assumptions are not verbalized.

Similarly, handoffs function as transfers of control over a patient, for example, when a patient is moved from an Emergency Department (ED) to another service such as Cardiology or Pediatrics. Control and responsibility often are transferred together, but, as we have noted, that does not make them the same thing. We see this in occasional disjunctions, such as when patients must be boarded in the ED for some period following a handoff of responsibility to an inpatient service (Apker et al., 2007; Behara et al., 2005).

2.4.3 Resilience

While transitions of responsibility or control can pose threats to patient safety, it is important to recognize that handoffs can also provide organizational resilience. Where there are high consequences for failure, organizations enhance resilience by cultivating their abilities to identify potential problems and errors early and to recover quickly from

unexpected events (Weick & Sutcliffe, 2001). Research shows that handoffs can improve resilience through the identification and correction of errors and the rethinking of approaches to care (Behara et al., 2005; Cooper et al., 1982; Patterson et al., 2004; Smith et al., 2008; Wears et al., 2003; Wears et al., 2007).

At the simplest level, handoff is a time for correcting errors in what is – or is not – transmitted, including double-checking a medication dose or lab value. These mundane conversational turns exemplify the error-correcting capacity built into a simple handoff conversation, and they are largely what the Joint Commission (2008) and others (e.g., Pillow, 2007; World Health Organization & Joint Commission, 2007) intend to foster through recommendations that handoffs provide opportunity for staff to ask and respond to questions. However, some observations have shown that questions can be rare. Horwitz and colleagues (Horwitz, Moin et al., 2009) analyzed audiotape handoffs and found 59 percent of patients transferred with no questions at all.

Research on sensemaking (Weick, 1995), updating (Christianson, 2009), and creative problem solving (Brophy, 2006) reveal that interactive processes that coordinate action can go far beyond correcting data errors to afford new perspectives on existing problems. Parties handing off responsibility may discover problems simply as a result of renewed attention to a patient while preparing for handoff (Jones et al., 2005). Similarly, parties receiving responsibility may bring a “fresh perspective and a rested mind” (J. A. Feldman, 2003, p. 910) to clinical settings where over-worked health care professionals may be locked into a mistaken appraisal (Croskerry, 2003) or suffering from decision-making fatigue (J. A. Feldman, 2003). Research suggests this fresh perspective has effectively identified various kinds of errors post-surgery (Cooper et al., 1982) and corrected misdiagnoses in the ED (Wears et al., 2003).

Two additional levels beyond simple error correction might be labeled: *anticipatory correction* and *reframing*. An example of anticipatory error correction might be a handing off party, aware of a record-keeping delay, who might say "the chart looks like she'll need [a diuretic] but they gave it to her while she was over in nuclear medicine" (Wolf, 1988). An example of reframing might be a receiving party who says "I know we've been treating him as a case of congestive heart failure, but maybe it's actually pneumonia. That fits the picture just as well." By examining the assumptions underlying actions, a process Patterson and colleagues (Patterson et al., 2007) call "collaborative cross-checking," errors can be caught and their effects minimized.

It is important not to decrease such resilience capabilities when introducing more rigidly standardized handoff procedures. At least four studies (Ash et al., 2004; Han et al., 2005; Kim et al., 2007; Koppel et al., 2005) have indicated how computerized physician order entry (CPOE) systems and patient care information systems (PCIS) that tightly specified new procedures could nonetheless introduce new sources of error and eliminate established error-catching capabilities. Research that further illuminates the resilience functions of handoff can benefit practice and help avoid similar unintended side effects of improvement efforts.

2.4.4 Co-constructing Shared Mental Models

Information exchange is a central function of handoff, but focusing too narrowly on the transfer and reception of information runs the risk of obscuring the more complex work that is often entailed in assembling that information into a coherent *mental model* of the patient. In exchanging information about a patient, clinicians are often co-constructing an understanding of that patient, establishing a larger sense of what type of patient is being handed off and how events are unfolding (Behara et al., 2005; Bruce & Suserud, 2005; Bruni et al., 2007; Cheung et al., 2009; Engesmo & Tjora, 2006; Patterson & Wears, 2010; Perry et

al., 2008). Caring for an individual patient often requires an holistic understanding that is greater than the sum of its parts, what clinicians sometimes refer to as “the big picture”.

In order to engender an holistic understanding of the patient in the mind of the party receiving responsibility or control, various pieces of information about the patient must be connected meaningfully and coherently (Murphy & Wears, 2009). This is regularly accomplished in health care through the use of narrative (Montgomery Hunter, 1991), perhaps because storytelling facilitates understanding better than lists of data can (Fletcher et al., 2004; Patterson, 2008b). Furthermore, patient information must be connected in order to convey a sense of the trajectories of illness and care (Strauss et al., 1997). A static picture of the patient at one point in time may not properly prepare the receiving party to continue care safely and effectively. Rather, the handoff must often provide an understanding of how events are unfolding and might be anticipated to develop in the future.

Merely providing information is not sufficient to ensure that that information has been heard and understood (Brindley & Reynolds, 2010; Wears et al., 2003). Speaking and hearing are separate accomplishments; meaning and understanding must often be worked out through interactive communication. The recommendations to allow time for questions (Joint Commission, 2006a; World Health Organization & Joint Commission, 2007) and to use techniques such as read-back or repeat-back (Chu et al., 2009; Committee on Patient Safety and Quality Improvement, 2007; Greenberg et al., 2007) are no doubt efforts to ensure that intended information has been comprehended. However, a greater degree of interaction may be required in many cases to ensure that a shared mental model has been co-constructed (Perry et al., 2008). For example, approaches that mechanically tack questioning on to the end of the handoff (AORN; Runy, 2008; Sandlin, 2007) overlook the

need to negotiate meaning throughout the handoff conversation and imply a largely one-way transfer of information throughout much of the handoff.

As Patterson and Wears (2010) demonstrate, handoffs may be framed in a number of ways, but most studies either implicitly or explicitly frame handoff as an information transfer activity. This framing leads to improvement and evaluation efforts that focus on completeness of information included in handoff as measured against some gold standard set of essential content. However, such efforts do not consider whether the information transferred, even if complete, has engendered in the receiving party a mental model that is sufficient to assume responsibility and provide further care as appropriate. Focusing on the *transfer* of information overlooks the often-challenging task of *assembling* that information into a coherent picture that supports inferences and the understanding of subsequent events.

The amount of work involved or the kind of actions required to co-construct an appropriate shared mental model will surely vary from handoff to handoff. For example, if both parties have existing knowledge of the patient, a shared model may already exist and need only be updated. If not, a quite different handoff may be in order. Similarly, while patients can vary, there are also recognizable patterns in their illnesses and treatment trajectories that may afford the use of stereotypical narratives (Patterson & Wears, 2010). By invoking familiar, generic mental models and then highlighting deviations from them, clinicians' narratives draw upon shared knowledge and then situate the present patient with respect to it. The amount of discussion that may be required to customize a stereotypical narrative can vary depending upon the extent to which the patient's case deviates from the narrative and the participants involved. A matter we take up below in our discussion of situatedness.

Framing handoff as the co-construction of a shared mental model implies that standardization approaches that attempt to rigidly structure care transitions and significantly reduce variability may be undesirable and introduce new hazards (Patterson & Wears, 2010; Perry et al., 2008). More flexible approaches to standardization are needed (Patterson, 2008b; Turner et al., 2009), calling into question the appropriateness of national handoff standards (Showell et al., 2010). In addition, framing handoff as a co-construction activity suggests that greater attention should be paid to the role of the party receiving responsibility or control (Boynton, 2007; Cooper & Kamdar, 2010; Propp, 2003) and the nature of the interaction between both parties (Murphy & Wears, 2009).

2.4.5 Learning

The technology of health care, the underlying science base, the social, economic and regulatory environment of health institutions, and health problems themselves are all remarkably dynamic. Hospitals and the highly professional people working in them need to sustain impressive rates of continuous learning in order to adapt to these unrelenting changes. The vast transformations of health care services occurring in recent decades have been possible only because of correspondingly high levels of learning by both the individuals and the organizations involved. Some of this has been via explicit training, but a much larger part has occurred through accumulating the lessons embedded in day-to-day experience. Since handoffs are one of the more frequent and consequential moments of considering patient progress, they are the inherent locus of a large share of this vital learning at both the individual and organizational levels.

Every handoff interaction is an opportunity for the participants to learn, in the sense of altering the skills and assumptions that will shape their actions beyond their work with the patient at hand. We have identified three aspects to this learning at the individual level. First, handoff is a locus of learning how to hand off (Klaber & Macdougall, 2009; Liukkonen,

1993; Patterson, 2008b). Since the vast majority of hospital personnel receive little or no training in handing off as part of their formal education (Al-Benna et al., 2009; Horwitz et al., 2006; Sinha et al., 2007), handing off is most typically learned on the job. While formal training may increase now that handoffs are a focus of explicit attention (Sachdeva et al., 2007), it will still be true that the cycles of practice and correction that establish handoff routines will occur in work settings. Rotations of personnel will therefore create tensions between practices preferred in a current setting and the habits or preferences an individual has acquired in earlier training (R. Patel, 2008).

Second, because they often occur between parties who do not have identical experience and expertise, handoffs create an opportunity for individuals to acquire knowledge and best practices from one another. The most obvious cases of this are interaction among nurses or doctors who have clearly differentiated levels of experience, such as interns handing off to senior residents, experienced nurses handing off to novices, (Fassett et al., 2007; Klaber & Macdougall, 2009; Skaalvik et al., 2010; Wolf, 1989) or questions asked in group handoffs with mixed expertise (Bernau et al., 2006; Lally, 1999; Sanfey et al., 2008; Stiles et al., 2006). However, there can be significant asymmetries even when the parties are at similar levels, and more experienced clinicians may learn from novices. Handoff participants may differ in prior formal studies, in colleagues with whom they have earlier worked, in relevant cases they have earlier encountered, and in their awareness of cutting edge research results. All of these differences may lead to one member of the pair (or group) having knowledge from which the other(s) can learn.

Third, participants in handoffs learn about the competence of other handoff participants (Harvey et al., 2007; Stiles et al., 2006; Wolf, 1988), and more broadly they learn what to expect about the performance of the huge array of systems, people, and organizational units that make up a modern hospital (Atkinson, 2004; Behara et al., 2005).

For example, the immediate context of a conversation may be a patient at hand, but when a handing-off physician says, "I asked for the consult three hours ago, and they haven't come," the receiving physician not only hears that she should be sure to follow up, but also learns something about the performance of the unit that hasn't responded.

Each handoff provides an occasion for significant changes in knowledge and assumptions that become part of the health professional who hears them and that help produce better care for subsequent patients. This learning is crucial to the efforts of hospital staff to make the hospital's resources work effectively for patients. Despite all the efforts to regularize processes, the unique and shifting needs of individual patients guarantee that hospitals cannot perform as massive clockworks in which each process runs exactly according to a pre-specification (Ren et al., 2008). In fact, even sophisticated factories with the most productive assembly lines demonstrate surprisingly high levels of time spent talking about and adjusting processes rather than directly producing (Adler et al., 1999). Personnel must continually make judgments about who to involve in a patient's care and on what schedule. These kinds of adjustments may improve care, shorten hospital stays or increase patient safety, but they are impossible without the underlying learning of performance expectations that handoffs so naturally engender.

In addition to what individuals may learn as a result of handoff interactions, there is also learning at the organizational level, although little research has directly explored such learning. We identify three broad ways that organizational learning happens within or as a result of handoff. First, since handoffs occur with high frequency (Whitt et al., 2007), theory of organizational culture would suggest that handoffs may play an important role in diffusing knowledge or opinion widely so as to be part of what most members of the organization are presumed to know or believe (Ashkanasy et al., 2000). Some research appears to support this (e.g., Broekhuis & Veldkamp, 2007; Carroll et al., 2008; Coiera, 2000;

Foster et al., 2008). Second, exchanges during handoffs can spread, reinforce, or undermine informal norms, reinforcing or changing the way the group perceives its duties and obligations (Eisenberg et al., 2005; Hays & Weinert, 2006; Lally, 1999; Måseide, 2003; Philpin, 2006; Stiles et al., 2006). Third, wide diffusion of pieces of knowledge or opinion can lead to structural change that alters the organization's future capabilities (Argyris & Schön, 1978). For example, unit resources and services delays are frequent topics of handoff conversation (Apker et al., 2010; Nemeth et al., 2008). Over a series of handoff sessions it can become evident to the residents on a staff that requests to the pharmacy during the night have not arrived by the time of a shift change. This might lead to a suggestion from the attending physician in the unit that staffing policies in the pharmacy be examined. This could contribute, in turn, to a change in late night staffing, or a change in particular personnel. The overall performance of a hospital as a system is maintained and improved via many hundreds of such feedback loops, and a large number of those channels may be driven to a significant degree by information that is surfaced in, or diffused through, handoff interactions. New safety-oriented processes in hospitals, such as Patient Safety Rounds (D. A. Campbell, Jr. & Thompson, 2007) or “reflexive ethnography” (Carroll et al., 2008) are designed to capture the insights that emerge around handoffs and other informal conversations and convert them to systemic improvements (Foster et al., 2008). Analysis of data collected in computerized handoff records can also be productive (Raptis et al., 2009). The organizational learning processes around handoffs are far from perfect (e.g., Jordan, 1991; Keenan et al., 2006; Lyons et al., 2010; Tucker & Edmondson, 2003), but they are vital to continuous change in hospitals nonetheless.

2.4.6 Summary

We have demonstrated that handoffs are multi-functional. In so doing, we have tried to emphasize the importance of many functions beyond the transfer of information.

However, we do not wish to give the impression that sufficient research has explored these additional functions. In fact, as we stated above, the overwhelming majority of existing work on handoff is built on the assumption that handoff is a largely one-way exchange of information, and this body of work underestimates and under-examines the multi-functionality of handoff. Furthermore, it is important to recognize that our categories do not fully exhaust the observations in the literature. In particular, handoffs have also been observed to provide occasions for emotional support (A. M. Evans et al., 2008; Hopkinson, 2002; Kerr, 2002; O'Connell & Penney, 2001; Strange, 1996; Yonge, 2008), for workgroup scheduling (Kerr, 2002), for team building (Lally, 1999), and for informal evaluation of staff (Philpin, 2006). Once we observe the multi-functional nature of handoffs, it follows that it can be important to consider how these many functions may be affected by efforts at handoff improvement. It is quite possible that, without careful design, a protocol or associated training regime that could maximize the safety of the individual patient might do so at a substantial cost to the learning processes of health care professionals and their units, possibly undermining the acquisition and diffusion of knowledge that is vital to the safety and quality of care received by populations of patients in the longer run. Moreover, some cases of resistance to change in handoff processes may not be merely “blind” or “stubborn,” but may be rooted in appropriate concern about damage to non-safety functions.

2.5 Situatedness

Concerns regarding the perceived safety and quality hazards of handoffs stem in part from observations that handoff practices vary considerably (e.g., V. M. Arora & Johnson, 2006; Borowitz et al., 2008). Standardization, the mode of handoff improvement currently receiving the most attention, is in effect an attempt to reduce variation; however, assumptions that variation in handoff practice is undesirable overlook the fact that each handoff is, to some extent, situated. All human action is situated within some arrangement

of various social and material structures, which may enable or constrain that action in different ways (Strauss, 1993; Suchman, 1987). Extending the theory of affordances (Gibson, 1979), we would expect that because these arrangements of structure vary and actors have varying amounts of agency relative to those structures and to one another, different situations afford different kinds of interactions. Thus, some degree of interpretation of and adjustment to situation is always necessary (Strauss, 1993; Suchman, 1987; Weick, 1979). A better understanding of the situated nature of handoff should reveal new opportunities for improvement beyond those approaches currently being tried.

In this section we explore how organizational factors constrain and enable handoff occasions and practices, contributing to variety in performance. We have arranged our discussion of the situatedness of handoff around four categories of organizational structures that bear upon and influence communication and coordination during care transitions. Admittedly, our categories overlap, but we feel they are useful for conveying the many ways that handoff situations can vary and for demonstrating the complexity and variety with which handoff participants must deal. First, we discuss how divisions of labor create different types of handoffs with distinct kinds of challenges. We then cover other social, temporal, and technological and environmental structures that situate handoff.

2.5.1 Divisions of Labor

Divisions of labor, including shift schedules, hospital services, and the increasing sub-specialization of medicine increase the number of handoffs required to provide ongoing care. Improved treatment can occur more efficiently, but these divisions come with increased coordination costs (Becker & Murphy, 1992). Furthermore, organizations have their limits, beyond which effective coordination and communication break down, sometimes with disastrous consequences (Starbuck & Farjoun, 2005; Wohlstetter, 1962).

There is considerable variety among the different activities that are subsumed under the label “handoff” or similar terms. Distinguishing between different types of handoff is the first step toward understanding how handoffs are situated and why they may be observed to vary. We have identified two broad types of handoffs based on what organizational division of labor is being spanned. *Within-unit* handoffs usually cross temporal boundaries, as when sign-out or shift report transfers responsibility between clinicians within the same hospital unit at shift change. *Between-unit* handoffs usually cross departmental boundaries as when a patient is moved from a critical care unit to the floor or a patient is admitted from the emergency department to an orthopedic surgery service.

This distinction highlights two important situational differences. First, within-unit transfers are likely to occur among clinicians of similar background and training, who share terminology, practices and unit identifications. Between-unit transfers, on the other hand, are likely to occur among clinicians of differing background and training and with only partially shared terminology, practices and loyalties. Between-unit handoffs may be further hampered by attitudes among the different specializations toward one another (Apker et al., 2007; Horwitz, Meredith et al., 2009; Jenkin et al., 2007; Thakore & Morrison, 2001). Second, between-unit handoffs most commonly involve the transfer of a single patient, while within-unit handoffs frequently involve multiple patients, giving rise to what we call the portfolio problem: how is attention during and after the handoff to be allocated across the several patients being transferred (Alem et al., 2008; Staggers & Jennings, 2009). Knowing this can be crucial for good management of emergent issues (Patterson, 2008b; Rughani, 2010), but it is information about the composition of the group, not just about any individual patients.

With both types of handoffs, although more commonly within-unit, participants may also vary in terms of their familiarity with the patient(s) being handed off. This gives rise to

another distinction. Handoffs may involve a *known patient transfer*, where the patient is familiar to both parties, or a *new patient transfer*, where the party receiving responsibility or control has no previous knowledge of the patient. These conditions structure the handoff situation differently, affecting what details must be covered and in what way. A known patient transfer may require less time than a new patient transfer and may be confined to efforts to update on any recent changes or events since the parties will already have mental models of the patient. In the most typical case, where they have handed off the patient previously, they will have a model that is shared to some degree. A new patient transfer, on the other hand, suggests a scenario where the receiving party has no established understanding of the patient and more work may be required to co-construct a shared mental model. With known patient handoffs, shortcuts, such as describing the patient as “the same,” may be meaningful and efficient (Parker et al., 1992), while those same shortcuts might be ambiguous and problematic (Brindley & Reynolds, 2010; Copp, 1972) with new patient transfers.

Similar distinctions among handoff types are offered in several reports (V. M. Arora et al., 2009; Behara et al., 2005; Coiera, 2000; Nemeth et al., 2008). All of these, like ours, turn on the notion of the varying difficulty of aligning the understandings of the participants.

Shift schedules provide a useful case for examining how organizational structure can situate handoffs in particular ways. Consider how different temporal divisions of labor produce different handoff patterns over time. What we call *closed handoff loops* result from staffing schedules in which party B (a physician or nurse) who earlier received a patient from party A (another physician or nurse), later hands the patient back to party A. In a system based on 12-hour shifts, this tight-loop ($A \rightarrow B \rightarrow A$) interaction will be a very common pattern, with the second handoff being for a known patient. In a different system

involving 8-hour shifts, the pattern will instead be $A \rightarrow B \rightarrow C \rightarrow A$. If the number of consecutive days on call is reduced, then even with 12 hour shifts, B may more often be making a new patient handoff to C, and the mental models of the patient held by C and A will also be less well-aligned. These *loose-loop* arrangements are much less conducive to continuous improvement (or "tuning") of the communication process. For example, in loose loops there will less often be feedback of the form "You forgot to tell me X." In addition, with shorter shifts, a physician or nurse present when the patient arrives, and therefore well-informed, will be with the patient for a smaller fraction of the patient's total stay. This is just one illustration of the possibility that even if individual handoffs are standardized, other factors may remain that are associated with decreased patient outcomes, requiring additional innovative solutions (Lundberg et al., 2006).

2.5.2 Social Structures

In addition to the large factors of similar backgrounds and patient novelty, there are many more variations in who participates that can also shape the dynamics of the handoff situation, including existing personal relationships (Smith & Mishra, 2010); differing levels of experience, even when participants are in the same specialty (Hoban, 2003); and relative statuses of the parties involved. Formal power structures and authority hierarchies have numerous effects on health care (Shojania et al., 2006), including influencing an individual's willingness to exchange information, ask questions, and seek clarification or help (Blatt et al., 2006; Mukherjee, 2004; Solet et al., 2005; Sutcliffe et al., 2004; Webster, 1999; Williams et al., 2007). The steep hierarchies of health care cultures can make individuals at all levels reluctant to seek help when they need it most (Shojania et al., 2006). Informal power relationships are also influential, as when adversarial attitudes between day and night teams hinder handoff communication (Bernau et al., 2006). Similarly, the increased use of teams in medical care can complicate the handoff situation, diffusing responsibility (Gandhi,

2005) across multiple clinicians, making it easier to neglect individual responsibility (Astion, 2004; Patterson, 2008a; Williams et al., 2007).

The variable mix of handoff participants helps to create one of the central challenges of handoff: selecting and conveying the appropriate content (Apker et al., 2007; V. Arora et al., 2005; Behara et al., 2005). Many handoff standardization efforts are in large part an effort to simplify this challenge by predetermining what content should be included. Nevertheless, the challenge will to some extent persist given that—even for the same patient—determining appropriate content must always be a somewhat situated activity. The experience and knowledge of the receiving party must be judged relative to both the situation and the patient’s needs in order to determine what information should be conveyed explicitly, what should be emphasized, and what is already understood or no longer important and, therefore, may be omitted (Engesmo & Tjora, 2006; Sutcliffe et al., 2004). To some extent this may be accomplished by identifying what is unique about the patient relative to stereotypical narratives (Patterson & Wears, 2010) or what is non-routine about the handoff situation. Mindfulness (M. S. Feldman, 2003; Levinthal & Rerup, 2006; Vogus & Sutcliffe, 2007a; Weick & Sutcliffe, 2006) and heedful interrelating (Weick & Roberts, 1993) are approaches to combating the suboptimal outcomes of dead routine through improving the quality of attention and adjusting action in the moment to meet the demands of unfolding situation. Perspective-taking, the active consideration of experience from another individual’s vantage point, has been shown to aid in the formation of social bonds by reducing generic conceptions of others and increasing affinity with them (Chartrand & Bargh, 1999; Galinsky et al., 2005; Galinsky & Moskowitz, 2000). The process of selecting and conveying content in handoff may benefit when handing-off parties actively take the perspective of the receiving parties and organize their actions and communications accordingly. There may be significant opportunities to improve handoffs by examining

practices such as perspective-taking and mindfulness where they currently appear in handoffs or by structuring handoff training or protocols to engender more heedful interrelating.

2.5.3 Temporal Structures

The handoff is also situated by temporal factors. We have already mentioned that the temporal structures that divide labor across shifts necessitate handoffs, but other temporal rhythms of the hospital also impact how and when work can be accomplished (Reddy et al., 2006). Particular hospital services (e.g., medical procedures, radiographic imaging, etc.) may be more readily available at certain times than at others, affecting what work can be accomplished prior to handoff, which may in turn have consequences for efforts to present the patient coherently and to co-construct a shared mental model during handoff. Examination of hospital work rhythms also provides insight into how between-unit and within-unit handoffs can interact, potentially further complicating care (Barbera et al., 1998; Benham-Hutchins & Effken, 2010; Patterson, 2008a). When hospitals operate at or near capacity, the practice of boarding admitted patients in the Emergency Department after a between-unit handoff has occurred can result in subsequent within-unit handoffs in the Emergency Department, exacerbating the dangers associated with what Apker and colleagues (2007) call the “grey zone.” Our own observations reveal that between-unit transfers are sometimes expedited, with varying results, in order to reduce patient portfolios for impending within-unit handoffs. While some have identified added complexities and hazards introduced by overlaps of these different types of handoffs, we are not aware of any research that has carefully examined interactions of within-unit and between-unit handoffs. The effect of temporal factors on the handoff may also be seen in pressures to compress handoff conversations efficiently so that a multitude of other clinical work may be completed (Forrester, 2005). Experimenting with overlapping shift schedules

is one approach that seems promising but as yet has shown limited results (Jeanmonod et al., 2010).

Furthermore, there are temporal aspects to illness and treatment that bear upon the handoff situation. Both illness and treatment trajectories span some period of time—progressing, regressing or otherwise evolving through interconnected events and resulting outcomes (Reddy et al., 2006; Strauss et al., 1997). Actions taken at one point in time may need to be informed and shaped by actions taken previously, and previous actions may entail important follow-up activities. Although the handoff occurs at one point in time, its effectiveness may be dependent on the degree to which the trajectory of the patient's illness and associated care efforts are communicated to the receiving party. Part of communicating in handoff, therefore, is to help the receiving party achieve an understanding of the patient's temporal trajectory. This includes identifying where in that trajectory the patient currently is, and guiding expectations regarding the actions that may be required to manage the trajectory in the future, particularly, but not exclusively, under the watch of the receiving party.

Temporal structures such as shift schedules are artificial and somewhat arbitrary. More importantly, they do not directly align with flows of patients into the hospital. That is, patients may arrive or be admitted at any point during the day—at any point during a given shift. A clinician's ability to identify relevant information and to convey that information concisely will be affected by the extent to which she herself understands the patient's case (Nemeth et al., 2008). Our discussion of known and new patient transfers above focused on the receiving party's knowledge of the patient, but the extent of knowledge of the patient that the handing-off party has can also vary. For example, a physician who has cared for a patient for several days would likely know more and have sorted through more concerns

about the patient than will a physician who just received a newly admitted patient a few hours prior to shift handoff.

2.5.4 Technological and Environmental Structures

The tools available to aid handoff and the location and communication media used when sharing information all play a part in situating the handoff interaction, shaping what can be accomplished, what participants perceive *should* be accomplished, and how. The user interfaces of designed things and the physical spaces in which work is accomplished shape cognition to some extent and afford particular kinds of activity (Gibson, 1979; Norman, 1994; Woods, 1998). Tools used in handoff range from paper documents (Alem et al., 2008; Ferran et al., 2008; Salerno et al., 2009) to computerized systems (Moller-Jensen et al., 2006; Thompson et al., 2010; Van Eaton et al., 2010). Discussions of the various merits of different handoff locations, including bedside, team room, or ward office, are plenteous (e.g., V. M. Arora et al., 2009; Caruso, 2007; McMahon, 1994; Singer & Dean, 2006). There is wide agreement on the need to reduce unnecessary interruptions (Coiera et al., 2002; Hedberg & Larsson, 2004; Laxmisan et al., 2007), although interruptions from other staff who have relevant information to share can facilitate the planning and coordination of care (Beach, 2006; Kelly, 2005; Lawrence et al., 2008). A wide variety of communication media are in use, from face-to-face encounters (Liukkonen, 1993; Solet et al., 2005) to telephone conversations (Bomba & Prakash, 2005) to printed documents, including, informal notes (V. Arora et al., 2005; Hardey et al., 2000), audio recordings (Horwitz, Parwani et al., 2009; O'Connell & Penney, 2001), formal sign-out documents (V. M. Arora & Johnson, 2006; Philpin, 2006), official entries in patient medical records and computerized handoff systems (Quan & Tsai, 2007; Sidlow & Katz-Sidlow, 2006; Stetson et al., 2002), including those generated from handheld devices (Luo et al., 2001; Wilcox & La Tella, 2001; Young et al.,

2000). Each medium has its own advantages and disadvantages, making it impossible to identify a single ideal medium (Friesen et al., 2008; O'Connell & Penney, 2001).

Extensive discussion of these details is beyond the scope of this review. For our purposes the important point is that the tools, physical environment, and modes of communication all shape the handoff by affecting access to and retention of information and affording certain kinds of interaction while preventing or making more difficult other kinds of interaction.

2.5.5 Summary

An abstract or ostensive conception of an organizational routine can obscure the reality that each performance of that routine happens within a particular situation (M. S. Feldman, 2003; Feldman & Pentland, 2003). The patient handoff is a highly situated coordination activity that is enabled and constrained by a variety of social factors and organizational structures. Furthermore, the assortment of structures and agentic forces at play and the influence they exert will – and frequently *should* – vary with each instantiation of handoff. Different situations afford different kinds of actions and interactions. We have shown that the necessary participation of particular parties in particular handoffs is a natural byproduct of the policies and organizational structures created by hospital leadership. Hierarchies, formal divisions of labor within and between units, asset location choices, privacy rules, team arrangements, and shift schedules are examples of structures which often have the effect, intentional or not, of determining when handoffs are necessary and who will be involved (Horwitz, Moin et al., 2009; Kellogg et al., 2006; Reddy et al., 2006; Williams et al., 2007). Many of the policies that create these structures are set in place for purposes other than the effects they have on handoffs or in an effort to improve one aspect of handoffs that produces consequences for other aspects. Efforts to improve handoffs will often be entangled with the rethinking of various organizational policies and structures that

determine who hands off to whom (Hendrich et al., 2004; Hendrich & Lee, 2005; Lundberg et al., 2006; Wakefield et al., 1994). To achieve the full potential of improvement, research and interventions will need to give more consideration to the situated nature of handoff, to look for ways to restructure that reduce the challenges of adjusting to situation where they can appropriately be reduced, and to enable and empower handoff participants to adapt better where the dynamic nature of situation cannot be controlled.

2.6 Standardizing: The Main Approach to Handoff Improvement

Multi-functionality, structural and physical situatedness, and the need to convey the unusual or salient features of specific patients are strong grounds to expect that a naive effort to standardize handoff would be difficult – and perhaps even damaging – to implement. Nevertheless, standardization is the path to handoff improvement most often attempted and the one on which regulators and professional associations have placed especially strong emphasis (Australian Healthcare & Hospitals Association, 2009; British Medical Association et al., 2005; Garling, 2008; Joint Commission, 2006a; World Health Organization & Joint Commission, 2007). As the literature would lead an organization theorist to expect, simple-minded standardization of handoff implies serious problems (Cohen & Hilligoss, 2010; Patterson, 2008b), and some regulators appear to be qualifying their insistence on it (Joint Commission, 2009a, 2010a, 2010c).

The literature abounds with a variety of suggested approaches to standardizing handoffs, with some reports of how these approaches may have brought about improvements. Computerized handoff systems (Kochendorfer et al., 2010; Van Eaton et al., 2005), documents (Bernstein et al., 2010; Block et al., 2010), and nearly thirty different protocols to structure the content of handoff conversations have been proposed, implemented and reported. In nearly all of these approaches, the function of information transfer receives priority, and rarely are other functions explicitly considered.

Most of the protocols—reviewed elsewhere by Riesenberg and colleagues (2010; 2009)—use mnemonic devices to ensure that broad topics are covered. The most common one is SBAR (Situation, Background, Assessment, and Recommendation), which has been endorsed by The Joint Commission and the World Health Organization (World Health Organization & Joint Commission, 2007), among many others (e.g., Amato-Vealey et al., 2008; Haig et al., 2006). SBAR structures the content of the report made by the party handing off. It provides no direction for the receiving party and overlooks the sometimes complicated negotiations required to co-construct shared mental models of patients. While some have tried to enhance SBAR and other such protocols by creating opportunities for questions from receiving parties (AORN; Runy, 2008; Sandlin, 2007) or instituting techniques such as read-back or repeat-back to signal that information has been transferred (Chu et al., 2009; Greenberg et al., 2007; World Health Organization & Joint Commission, 2007), these protocols nonetheless are built on an assumption, intended or not, that handoff is a largely one-way transfer of information.

There does not appear to be any direct research evidence that standardization per se results in improved handoffs and increased patient safety (Cohen & Hilligoss, 2010; Patterson & Wears, 2010; Talbot & Bleetman, 2007), although there is some evidence standardization efforts can improve information accuracy and completeness as measured by participant perceptions (e.g., Kochendorfer et al., 2010; Wayne et al., 2008). The Joint Commission, like the literature in general, relies on observations made in other high performance organizational settings, along with plausible arguments that standardization should improve safety, reduce costs, and increase teamwork, informal education, staff emotional support, error identification, and care continuity (Patton, 2006).

Where studies have measured the effects of standardization efforts, they have typically used questionnaire-based instruments. These approaches to evaluation measure

perceptions of handoff improvement and, therefore, engender uncertainty as to whether reported improvements have come as a result of the interventions or are rather a byproduct of more mindful enactment of routine. The frequently repeated nature of organizational activities can produce mindless actions over time as organizational actors respond automatically without recognizing and adapting to the demands of the present situation (Cohen & Bacdayan, 1994; Egidi & Narduzzo, 1997). Simply instituting a new protocol, computer system, handoff document, training program or other such initiative may yield some amount of improvement just by raising collective consciousness about handoff and signaling that such transitions are important to the organization. That is, as a result of having their attention directed to the importance of handoff, clinicians may give more heed to their actions and structure their own communication more carefully. Thus, some of the improvements observed may be attributable to increased mindfulness rather than to the new protocol or other intervention. Research designs, such as longitudinal or comparative treatment studies, that explicitly account for this Hawthorne-like effect are needed. Longitudinal studies can also help establish whether or not improvements are lasting. Connecting handoff to non-perceptual measures would be beneficial, and a few studies are moving in this direction (e.g., Hyman et al., 2010; Mazzocco et al., 2009; Petersen et al., 1994; Petersen et al., 1998). So far, however, efforts to associate handoff with gold standard outcomes such as adverse event rates remain largely elusive (Cohen & Hilligoss, 2010).

The literature on handoffs has been influenced substantially by efforts to analyze and borrow from knowledge of effective handoffs in other high performance settings, such as aircraft piloting, nuclear power plant operations, or racing car pit stops (Brindley & Reynolds, 2010; Catchpole et al., 2007; Catchpole et al., 2010; Dunn & Murphy, 2008; Harris et al., 2006; Parke & Mishkin, 2005). However, the irreducible variability at the patient level raises questions about the limits on such conceptual borrowing (Cooper, 2010; Lyndon,

2006; Tamuz & Thomas, 2006; Wachter & Shojania, 2004). Although the very label 'handoff' might suggest otherwise, a patient is far less standardized than a relay baton. For example, checklists are essential for pilots and have provided important reductions in infections during line insertions (Gawande, 2007b), but how far can the checklist idea be extended into the handoff domain (Patterson, 2008b; Powell, 2007)? While some medical specialties such as anesthesiology or pharmacy may be appropriate analogs (Coutsouvelis et al., 2009; Reason, 2005), an average patient in, say, a Neurology service or a Pediatrics ICU is not as near to being prototypical as is an average Boeing 737 preparing for takeoff. In the latter case the list of dimensions to be visited may be long, but it is quite well understood and extremely similar across all instances of that type of airplane. In the hospital case, the set of complicating factors that can arise is huge, full of novelty, and continually changing. Under such conditions, the design of a handoff standard will have to determine what parts of the handoff are well-understood and essential, and could be incorporated in a relatively rigid device such as a checklist, and which parts should be included only on the judgment of the physicians and nurses involved, the judgment that selects the information likely to be pertinent for the person assuming responsibility or control.

The multi-functional, situated nature of handoff implies that while standardization efforts may yield some improvements, other approaches are needed to achieve greater improvements, to ensure that the many beneficial functions of handoff are enhanced and not undermined and that clinicians are enabled and empowered to coordinate care in ways that adapt to the demands of the present situation.

2.7 Implications

If simple standardization is problematic and may introduce new complications to coordinated care, what other approaches are promising and what new research will advance them? Our framework and perspective suggest our responses. We organize our

discussion of implications first around the two characteristics of handoffs we have highlighted, their multi-functionality and situatedness. We then discuss some implications that emerge from interactions between these two characteristics. Finally, we conclude with implications for research and management based on the view of handoff as recurring pattern of organizational action.

2.7.1 Multi-Functionality

We surely do not know everything we should about the functions of handoffs and design challenges they must meet. There is a need for increased research focused on uncovering and characterizing the additional functions of handoff beyond information exchange. When and how do these additional functions get accomplished? What helps or hinders them? How are they intertwined or in tension with patient safety aspects of handoff? How do they enter into resistance to new handoff procedures? How might handoff practice, tools and training approaches be designed to better facilitate the multiple functions of handoff? What organizational outcomes do these additional functions produce and how might we measure such outcomes? We have suggested that handoffs, as frequently repeated routines, serve an important role in diffusing knowledge through the hospital, thereby enabling the organization to learn and adapt. As we have mentioned, we have found very little research within the handoff literature that explores this function. Learning and many of the other functions of handoff, such as socialization, informal evaluation of staff, and resilience, are all matters of concern to organizational and management researchers. Handoffs represent an opportunity for such scholars to examine issues of importance to organization theory, and such scholars have skills and perspectives that the field of handoff improvement very much requires.

If a good handoff is one that engenders a shared mental model of the patient's case, in part by delivering the most important information in the currently unfolding context,

then it can be valuable to closely examine how this happens in practice, including where it breaks down. Similarly, examining what clinicians believe is likely to be important, how they form their impressions of those most important aspects of patients, and how they might form more accurate expectations (Groopman, 2007; Montgomery, 2006) may suggest new ways of structuring handoffs and fostering more beneficial interactions. The literature already contains examples of studies that have moved in this direction. The study by Arora et al. (2005) used a “critical incident” questionnaire to get at the kinds of problems a unit was encountering with sign-outs during the previous shift and over the preceding year. Horwitz et al. (2009) made a similar examination of problems occurring between an Emergency Department and internal medicine services, and used group discussion as well, in developing a sign-out curriculum (Horwitz et al., 2007). Wesorick et al (2006) and Lurie et al (1989) shadowed cross-covering physicians and catalogued the most common problems of their patients, and others (J. K. Anderson & Kaboli, 2007; Borowitz et al., 2008; Ramratnam et al., 1996) have collected similar data at the conclusion of resident shifts. Such approaches acknowledge the emergent and on-going aspects of constructing understandings of patients and planning appropriate care and can lead to analyses that suggest how understandings can best be shared and reexamined to enhance resilience during handoff.

The multi-functionality of handoff has implications for hospital policy makers as well. Change initiatives are likely to produce better results, and introduce fewer new problems over the long term if they explicitly acknowledge that handoffs can serve multiple functions that are vital to the continued effective functioning of the organization. There is no question that handoffs need to involve the transfer of patient information to ensure safe, high quality care, and some amount of effort to structure the content of handoff is sensible (Patterson, 2008b). But efforts to improve handoffs may provide the greatest gains if they

acknowledge that many handoffs are more than simple information exchanges that can be made safe simply by introducing a checklist, document or protocol. Without careful consideration of the multiple functions handoffs serve, standardization efforts that maximize the safety of the individual patient might inadvertently undermine other processes at play in handoff processes that are central to the learning and the effective functioning of the hospital. Put positively, by fostering improvement efforts that respect the multi-functionality of handoff, administrators may enhance the capabilities of their organizations to catch and recover from errors; to collaborate more effectively in the planning of care; to diffuse knowledge widely; and to adapt more flexibly to changing contexts.

2.7.2 Situatedness

If handoff is a complex, highly situated organizational routine, enabled and constrained by many different organizational structures and social dynamics, then there is need for research to better characterize this situatedness and to examine the effects of various situational factors on handoff and subsequent care. That handoffs are situated implies research is needed that better explains or measures the effects of structural factors on handoff, including establishing who participates, which resources are available to which parties, and what kinds of interactions various situational arrangements either do or do not afford. Handoff is affected by shift schedules, by the degree to which interfaces of electronic records or paper documents are usable, by the spatial and material aspects of physical environments, by auditing or publicizing procedural compliance, by the power and relational dynamics between the parties involved, and by a myriad of other factors, many of which may be altered by decisions at the organizational level, rather than being left to individual participants or informal local groupings.

The situatedness of handoff implies the activity is more complex and varies for a wider set of reasons than much of the existing research recognizes. Efforts to standardize handoff by narrowly focusing on identifying the content or topics to be discussed in handoff overlook many additional social and organizational factors that complicate handoff communication. Organization theory would suggest that there are additional improvements that may be attained by addressing the complexity and constraints imposed by organizational structures. A variety of research foci are needed, including examining how multiple situational factors interact, as well as studying the detailed effects of particular factors that structure the handoff situation. Researchers can also help by identifying what improvements might be attained by altering structural arrangements and analyzing the impacts of change efforts.

Research is needed to identify and evaluate new approaches to handoff that will reduce unnecessary variations in practice by minimizing the challenges imposed by organizational structure and enhance the organization's ability to adapt flexibly where situational factors cannot be controlled and some degree of variation is necessary or desirable. Situatedness can produce considerable complexity for organizational actors who must adjust their performances of routines to dynamic circumstances. Research might examine how this complexity could be reduced beyond structuring the content of handoff. How, for example, might the role of the party receiving responsibility be enhanced, even in the face of status differences that might discourage questions or alternative interpretations? How might the party handing off be induced to take the perspective of the receiving party so that the patient's case is presented in a way that naturally and effectively orients the receiving party? How can mindfulness and heedful interrelating be facilitated despite high rates of repetition? What effects result from different approaches to addressing the portfolio problem? How might the cultural context be adjusted to reduce the complications

caused by social factors such as formal hierarchies and the differences among health professions and medical specialties? Many other questions that address situatedness in handoff can benefit improvement efforts and extend organization theory in the process.

The situatedness of handoff holds implications for administrators as well. Change initiatives will have the greatest chance of producing improvements if they acknowledge that handoffs are complex, social interactions embedded in dynamic physical and socio-cultural contexts, enabled and constrained by various organizational structures. The problems and challenges of handoff are not merely the result of health professionals “forgetting” or “neglecting” to share information, but are often the consequences of training, norms, temporal and departmental divisions of labor, power distributions, and other structures over which administrators have some influence. Rethinking shift schedules, the rotation of personnel, the physical environment of work areas, the implicit cultural values of the organization, and other such organizational factors may be needed in order to realize desired improvements.

2.7.3 Interaction of Multi-Functionality and Situatedness

Most of our discussion has separated the multi-functionality and situatedness of handoffs. While this serves purposes of clarity, it hides the fact that these two characteristics of handoffs interact and influence one another. Understanding these interactions is important for research and improvement efforts.

First, multi-functionality has consequences for how handoffs become situated. The functions at play in any given instance of a handoff, whether simply pursued by the parties involved or emphasized by the larger organization, will mobilize different resources and shape the use of those resources, thereby influencing the situatedness of handoff. For example, emphasizing the information transfer function in the pursuit of the safety of individual patients often leads to the implementation of tools or protocols based on a

largely one-way information transfer model. The interventions frequently structure the content to be provided by the party handing off, while mostly overlooking the role of the party receiving responsibility or control. Intentionally or not, this may result in the emergence of new norms that dictate that the receiving party's role is simply to ask questions at the end of the presentation. Alternatively, acknowledging that handoff can serve as the co-construction of shared mental models might lead to differences in training and other interventions that favor conversation and the active involvement of both parties throughout the handoff. This, in turn, structures the handoff situation around different norms of behavior than did the first example.

Second, the way a handoff is situated has consequences for what functions may be accomplished. Structural arrangements affect what resources are available during handoff shaping what actions the handoff situation affords, thereby influencing what functions are – or are not – likely to be accomplished. For example, the advent of electronic medical records demonstrates that a new resource can reshape between-unit handoffs by distributing information to receiving parties in advance of handoff, enabling those parties to enter the conversation more informed and better able to participate actively, making handoffs more resilient (Hilligoss, 2010). Likewise, financial pressures to control time spent on handoff, in a hospital that emphasizes the information transfer function, may favor self-completing electronic forms to structure and populate handoff information, potentially resulting in less resilience as errors in such systems may propagate more widely, and be less subject to doubt (V. M. Arora et al., 2007; E. M. Campbell et al., 2006; Koppel et al., 2005).

The link connecting multi-functionality and situatedness is not always linear. There are many ways that these characteristics of handoff can interact and produce complications for the delivery of health care services. For example, emphasizing the individual learning

function of handoff may conflict with efforts to conduct bedside handoffs where clinicians may be unwilling to discuss details about a patient that are educational for less experienced clinicians but are potentially embarrassing to the patient or would compromise privacy. Tensions between efforts to restructure situations and efforts to enhance certain functions may arise if these various efforts are not carefully aligned. Therefore, practical change efforts and research studies will need to keep attentive to both aspects of the complex nature of handoff.

2.7.4 Handoffs as Recurring Patterns of Organizational Action

We have argued that the recurring character of handoffs means that they are to some extent routine activities, governed by habits of individuals and cultures of groups. This means that practices are unlikely to be changed simply by introducing new incentives for changed behavior, such as threatening to punish leaving the hospital before handoff or financially rewarding completion of an online form. Change may not be quite as difficult as hand-washing (Gawande, 2007a), but handoff practices appear deep-seated in some similar ways. Training in hospitals or professional schools or both will likely be required, but may not suffice unless aligned with organizational norms and the affordances of the practical situations. Our view of the literature on routines suggests that well-established habits of individuals and routines of groups change by introducing readily reproducible new patterns with definite short-term advantages over old ones, and in situ practice that establishes the new action pattern in place of the old. And there will always be a danger of routinized handoff activity drifting into mindless repetition that loses track of the important aspects of the situation. As we mentioned previously, longitudinal studies that explore the impacts of interventions over an extended period of time are needed.

2.7.5 Approaches and Methods

Handoffs pose significant opportunities for researchers, and a variety of methods and approaches is appropriate. Intensive field observations, including ethnographic methods, have already made useful contributions, especially in revealing the flexible adaptation of handoff activity to the variations in patients and situations (Behara et al., 2005; Christian et al., 2006; Ren et al., 2008). Such approaches can sometimes uncover patterns that questionnaires and interviews may not (Gosbee, 2010) and are particularly well suited to examining the relationship between phenomena and their context. Analyses of audio (e.g., Apker et al., 2010; Horwitz, Moin et al., 2009; Nemeth et al., 2008; Nemeth et al., 2005; Sledd et al., 2006; Staggers & Jennings, 2009) and video recordings (Carroll et al., 2008; Hays & Weinert, 2006; Iedema et al., 2009) of handoffs are additional promising approaches for uncovering how handoff participants accomplish or trade off multiple functions during handoff or how they do or do not appropriately adjust their interaction and communication to the distinct demands of the situation. On the down side, field research and analysis of recorded handoffs are expensive in skilled investigator time and therefore do not readily scale up to studying populations of organizations.

Questionnaires have been a workhorse of handoff research, especially on the studies related to defining good handoffs. But the possibilities for innovations in questionnaire instruments are nowhere near exhausted. This remaining potential is demonstrated by two recent examples: the previously mentioned use of critical incident recall questions (V. Arora et al., 2005), and the scale of nursing communication developed by Vogus and Sutcliffe (2007a, 2007b) which proved sensitive enough to predict differences in patient fall rates and medication errors measured six months later. Questionnaire data has also been used to perform social network analyses of handoff communication patterns (Benham-Hutchins & Effken, 2010).

Simulation offers great potential for evaluating both handoff practices and training approaches (Buckley & Gordon, 2010; Farnan et al., 2010), and simulated patients have already been used in handoff studies (Berkenstadt et al., 2008; Hamman et al., 2010; Zimmer et al., 2010). This technology is rapidly increasing in realism and offers striking possibilities for controlled experiments with the advantage that the experimenters know the correct diagnosis and treatment exactly (Christianson, 2009; Rudolph et al., 2009). The drawback of lab-based simulation is that it removes the phenomenon from the larger context and work processes in which it is embedded, making it difficult to examine some dimensions of the situated character of handoff.

Data from computerized handoff systems may be useful for understanding handoff practices and evaluating change efforts. A few studies have begun to analyze such data (Campion et al., 2007; Petersen et al., 1998; Stein et al., 2007; Van Eaton et al., 2004). As the amount of handoff information moving through hospital computers increases, there will be interesting opportunities to match such usage data to other records, and it may be possible also to analyze the content of the computerized portion of handoff reports (e.g., E. M. Campbell et al., 2006). Hospitals now routinely catalog sentinel events (adverse events and near misses) – though there still are under-reporting problems (Henneman, 2007). As these files grow they will offer opportunities for matching with other computerized hospital records (Meltzer & Arora, 2007; Velji et al., 2008). This approach was first demonstrated by Petersen et al (1994), but the rapid growth of such collections should soon support innovative extensions.

2.8 Conclusion

We have proposed a framework of patient handoff that suggests the activity is much more complex, that its effective accomplishment is frequently more nuanced, and that its impacts are farther reaching than prevailing discussions would indicate. Highlighting the

situated, multi-functional, and routine character of handoff reveals that the current focus on standardizing the content of handoff communication overlooks significant improvement opportunities and runs the risk of introducing unintended side-effects with potentially significant organizational consequences. Improvements may not be simple or easily achieved. While this will not be pleasant news to clinicians and policy makers who have so many responsibilities in addition to improving handoffs, we strongly believe that this multi-functional, situated view of handoff holds promise not only for greater improvements in terms of the safety and of the quality of care for individual patients, but also for improving and enhancing many important organizational processes, such as learning and resilience, that have significant consequences for the long-term health of the organization.

Chapter 3

Research Design and Methods

In this chapter I describe the research design and methods I used to address my research questions. I begin with a rationale for my research design, including an overview of the epistemology and theoretical perspective that provide a philosophical foundation for my research, and a discussion of how I used the methodology of Grounded Theory to guide my methods. Next I describe my research sample in two parts: an overview of the study site, and a description of the study participants. I then provide a detailed description of my data collection methods, which include semi-structured interviews, observations, recorded and transcribed handoff conversations, and clinical documentation. I conclude with an overview of my data analysis methods: immersion, coding, and memo writing.

3.1 Rationale for Research Design

The purpose of this ethnographic study is to provide insights into handoff practice variety by developing grounded theory of admission handoffs between Emergency Department and General Medicine physicians. My research questions, restated from Chapter 1, are:

1. How might variations in the practice of admission handoff between Emergency Department and General Medicine physicians be explained by the multi-functional, situated nature of handoff?
2. How do physicians come to have particular understandings of their patients, and of what are these understandings comprised?
3. How are admission handoff negotiations accomplished?

4. How do organizational boundaries figure in the interactions of admission handoff?

My purpose statement and research questions place emphasis on understanding and characterizing. The practice focus implies a need to study action and process. The concern about situatedness implies that context matters. Finally, the purpose statement identifies the goal of developing a theoretical understanding. All of this indicates that a research design that approaches the phenomenon open-ended and inductively, one that favors context-sensitive qualitative data would be most appropriate. I therefore designed this study to gather a variety of qualitative data using ethnographic approaches guided by the methodology of Grounded Theory. In the following sub-sections, I provide an overview of the epistemology and theoretical perspectives that provide a philosophical foundation for my work and then describe important aspects of the Grounded Theory methodology.

3.1.1 Epistemology and Theoretical Perspective

The epistemological assumptions of the researcher and the theoretical perspective from which he or she studies the world have implications for the collection and analysis of data and for the knowledge claims that can be made. In the interest of making these assumptions and perspective explicit, I briefly discuss social constructionism and symbolic interactionism and the implications they have for my study.

Social constructionism is a sociological theory of knowledge with a rich tradition (Berger & Luckmann, 1966; Crotty, 1998; Lincoln & Guba, 1985). Social constructionism posits that all meaningful reality “is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context” (Crotty, 1998, p. 42). Meaning and reality are not purely objective, in this tradition. That is, the meaning of a thing or event is not a fixed property of that thing or event, but is rather a social construction. It has been

constructed—and often reproduced—through human interactions within particular socio-cultural contexts. This is not a subjectivist view of knowledge. Humans are not positioned as *creating* knowledge from nothing or completely independently of others. Rather humans are positioned as *constructing* knowledge through interactions with one another and with the physical world and by using the norms and values of their cultures. This, in turn, suggests that where interactions, norms, and values are different, people may construct different knowledge and arrive at different understandings of reality.

This social constructionist epistemology had at least three implications for my research. First, I needed methods that would allow me to understand the processes by which meaningful reality is constructed and reproduced in admissions work. Second, those methods had to respect the role that context and culture play in constructing knowledge. Third, in gathering data, I needed to be alert to and respectful of multiple understandings of reality. My intent then was not to decide which understanding was “correct” but rather to understand how it is that multiple understandings could emerge and to craft my theoretical explanations to respect the complexity of a world where differing realities could exist.

Given the goal of understanding how meaning is constructed through interactions and within specific situations and contexts, I chose symbolic interactionism (Blumer, 1969) as my theoretical perspective. Symbolic interactionism holds that humans interpret actions (their own and those of others) dynamically and in context, and that these interpretations shape subsequent actions. An important point of this perspective is that actions do not directly produce responses. Rather, responses are made with respect to interpretations of actions. The use of the term “interpretation”, however, should not be taken to mean that all actions are consciously interpreted through a rational process of deliberation. Symbolic interactionism is derived from American Pragmatism which emphasized not only the role of

conscious thought in guiding action, but also the roles of emotion and habit (Dewey, 1922; W. James, 1961).

Symbolic interactionism drew my attention to two important components of social action: symbols and interaction. First, there is an emphasis on symbols, the referents by which meaning, thought, intentions, and emotions are communicated. Language is perhaps the most common symbol used by humans to communicate, but gestures, postures, sounds, artifacts, physical spaces, and any other objects may be used as symbols to communicate or to be interpreted. This suggested that I needed to examine how language, bodily gestures, and physical spaces and objects were used in the work of admitting patients.

Second, symbolic interactionism emphasizes interaction. Human action is inherently social. Unless a person has spent his entire life apart from all other human beings, even actions accomplished in solitude may exhibit traces of interaction. We are ever influenced by the norms and expectations of our cultures and by the thoughts and beliefs others have expressed, even when they are not co-present with us (Blumer, 1969; Weick, 1995). According to George H. Mead, an American Pragmatist sociologist, even one's notion of self arises through interaction as one interacts with oneself and as one learns to view oneself from the perspective of others (Mead, 1934). All of this suggested a need to focus on interactions in and around handoff. Further, it meant that any given actions observed or reported could not be properly understood in isolation. Actions had to be seen as responses to interpretations of previous actions (of the self or others) and as material for future interpretations and further interactions.

In sum, a social constructionist symbolic interactionist approach entails focusing on the contextually-embedded, interactional processes by which meaning is constructed. The approach emphasizes language and other symbolic means of communication. Thus, required are a methodological approach and particular methods which respect the role of

context in shaping human interactions and that allow the researcher to examine symbolic social interactions closely. I turn now to a discussion of Grounded Theory, the methodology that guided my data collection and analysis efforts.

3.1.2 Methodology

As noted, my intent was to examine the interactional, interpretive, situated processes of admission handoff. Arguably, such processes involve a range of actions from conscious reflection to unconscious automaticity; from rational thinking to affective response; from deliberate action to habitual reaction. As such I required methods that could provide data on both conscious and unconscious actions as well as the role situational elements play in shaping interaction. I therefore chose to use field-based, ethnographic methods, including interviews and context-sensitive observations, in order to understand and richly characterize the situated, multifunctional nature of admission handoffs.

To draw these multiple methods together and provide guidance for the use of methods, I selected a Constructionist Grounded Theory methodology (Charmaz, 2006). The goal of this methodology is to develop theory, including conceptual frameworks and substantive theory that explain activity within a specific domain (Glaser & Strauss, 1967). The strength of Grounded Theory is that it enables the researcher to construct theoretical explanations of closely observed phenomena—that is, to produce theoretical explanations *grounded* in data.

Studies using Grounded Theory progress by alternating between data collection and analysis iteratively: as data is collected, it is analyzed. Themes emerge, the researcher develops abductive inferences (Richardson & Kramer, 2006), potential explanations which are used to revise and focus data collection efforts and to guide sampling. Each additional collection of data is then analyzed and used to refine the emerging theoretical

understanding. Although data collection and analysis happened iteratively over the entire course of this project, I discuss them separately below for the sake of simplicity.

During each iteration of data collection, I used theoretical sampling to guide the recruitment of participants and the selection of observation opportunities. Theoretical sampling is a purposive method of selecting additional data collection opportunities based on their likelihood to provide insight into the themes emerging from the analysis of the existing data (Charmaz, 2006; Glaser & Strauss, 1967). It is a dynamic, emergent approach to sampling that enables the researcher to adjust sampling flexibly during the process of the study to pursue the most promising aspects of the developing analysis. Furthermore, since the goal of this research was not to produce statistically-valid generalizations, random sampling was deemed inappropriate. Rather my goal was to develop a rich characterization and conceptual understanding of the phenomenon of interest; therefore, sampling that would ensure exposure to a considerable variety of data was needed. And since it was impossible to know at the outset what dimensions of the data would be most important, theoretical sampling was particularly appropriate and useful.

3.2 Research Sample

The discussion of my research sample is organized in two parts. First I describe the site where I collected my data, providing a rationale for why it was appropriate for my purposes. Second, I describe my participant population.

3.2.1 The Study Site

Ethnographic data collection methods are time-intensive in terms of the demands they place on the researcher. Developing a nuanced appreciation of the context and culture of work at a particular institution necessitates spending considerable time embedded in that location. As a result, such methods are most appropriate for studying single sites.

Because my intent was to examine the challenges of admission handoffs, and to understand the complexity of adapting routine practice to variable situations, it was necessary to select a study site that would allow maximum exposure to such complexity and situatedness. For these reasons, I selected a large, highly-specialized teaching hospital as my research study site.

The research site is a part of a large health system located in the Midwestern United States. The health system includes three hospitals with more than 900 licensed beds and more than 43,000 admissions annually, excluding newborns. In addition, there are several specialty centers and more than thirty outpatient clinics affiliated with the health system. All data were collected from the main adult care hospital, a 550-bed, highly specialized tertiary teaching and research facility and trauma center. Throughout this dissertation, I refer to this adult hospital as “Memorial Hospital.” In this section I provide an overview of the hospital’s services and include a brief section on its clinical information systems.

3.2.1.1 Emergency Department

The Emergency Department reports more than 80,000 visits annually, roughly half of which result in an admission. Nearly 45% of all admissions to Memorial Hospital come through the Emergency Department (ED). Located in the basement of the hospital, the ED is divided into several sections, each focusing on different kinds of care. The “main ED” has twenty-two semi-private patient rooms that form a ring around a central work area that is divided into a physicians’ work station and a nursing and clerical work station. The “east end” is separated from the main ED by a hallway and features nine additional semi-private patient rooms. Often patients who are being admitted are moved out of the main ED and into the east end while waiting for an available bed “upstairs.” The “protocol” section is also physically separated from the main ED by a hallway. It includes sixteen fully private patient rooms which are primarily used for less-acute patients for whom admission is unlikely.

There are nine additional hallway beds throughout the main ED that are frequently used in overflow situations. There are also three resuscitation bays used for serious trauma cases. Finally, during the course of this study, the hospital opened an 18-bed adult medical observation unit (i.e., “Obs Unit”) to handle patients from the ED who do not require admission but who need to be observed for some period less than 24 hours. The Obs Unit operates as a semi-autonomous division.

The Emergency Department has 56 resident physicians (“residents”) and 41 attending physicians (“attendings”). The ED residency is a four-year program. Residents are designated as fourth year (4Y), third year (3Y), and second year (2Y), while first year residents throughout the hospital, regardless of specialty, are referred to as interns. Residents from other specialties, including various surgical and internal medicine services, rotate through the ED, as well. In addition, medical students from an affiliated university medical school complete a portion of their clinical training in the Emergency Department.

Physicians in the Emergency Department at Memorial Hospital generally work 8-hour shifts, and then “sign out”⁸ to a colleague of the same or closely related rank. Attendings sign out at the end of their shift to incoming attendings. Interns sign out to incoming interns; second year residents sign out to incoming second years, and so forth. However, because generally less staff are needed at night, afternoon or evening resident signouts may involve coordination across ranks. Attending signouts happen three times each day: 7:00AM, 3:00PM, and 11:00PM. Signouts among residents happen at similar times, although the exact times vary for different ranks.

ED attendings may work in one of two capacities during a shift. They may serve as a supervisor of residents, in which case much of the work involved with caring for patients is

⁸ For the sake of clarity, I use the term “sign-out” and its variants to refer to a handoff between parties within the same service and reserve the term “handoff” for between-unit transfers.

directly accomplished by residents and the attending oversees this work serving as an advisor and giving the final approval on treatment and disposition. Alternatively, ED attendings also may work an “attending only” shift, in which case they have no residents working under them, and the attendings therefore handle all patient care activities directly. Residents work largely in teams, so that interns and second years are supervised by more experienced residents as well as by attendings.

The protocol unit of the ED has one attending overseeing all patients in that unit during the day. Physician assistants (PAs) do much of the work in the protocol unit. The Obs Unit is staffed by ED and Internal Medicine physicians and PAs. Generally, residents do not work in the protocol unit or the Obs Unit.

All sections of the ED have multiple nurses and one or more clerks on duty at all times. In addition, there are always multiple emergency technicians (i.e., “techs”) working in the ED, assisting nurses and physicians in a variety of ways, including registering incoming patients and moving patients around.

3.2.1.2 Internal Medicine Services

The Memorial Hospital Department of Internal Medicine is divided into multiple divisions that focus on different specializations. Among these are several which directly admit patients, including Cardiovascular Medicine, Gastroenterology, Hematology and Oncology, Pulmonary and Critical Care, and General Medicine. Other divisions provide care, but do not admit patients onto their services, including Infectious Disease; Metabolism, Endocrinology and Diabetes; Nephrology; and Rheumatology.

The Department of Internal Medicine consists of more than 120 residents and 42 attending physicians. General Medicine, a division of Internal Medicine, includes four resident services and a hospitalist service.

The resident services are comprised of teams of residents—usually two interns and one second-year resident—supervised by an attending. Frequently a third or fourth year medical student is also included on the team. Patients are divided among the interns, with the second-year (also called the “senior resident”) overseeing all patients. As is typical for teaching hospitals, residents rotate monthly.

Admission responsibilities rotate among the four General Medicine services so that each resident service is “on call” every fourth day. A total of eight new patients may be admitted to a single resident service on any given “on call” day.

The hospitalist service consists only of attending physicians, known as “hospitalists.” At the start of my study there were eight hospitalist “teams,” and patients were divided among these teams. During the study, a ninth team was added. The hospitalist service employed PAs when the study began, but phased these staff members out over the course of my observations.

The hospitalist service employs roughly thirty physicians. Each day from 7:00AM to 7:00PM there are nine hospitalists working, one on each team. Typically hospitalists are assigned to the same team for several days or a week at a time to ensure continuity of care. Each night from 7:00PM to 7:00AM, three hospitalists oversee all patients on the service. Each of these night physicians oversee three of the nine teams. Finally, there is a “swing shift” from 2:00PM to 7:00PM each weekday, during which one hospitalist will take over the responsibilities of admitting patients in order to free up the other nine doctors to concentrate on finishing up daily care activities for their existing patients.

General Medicine patients can be housed on any of a number of different wards scattered across several floors of the hospital. Included in these wards are some that provide specialized services, such as telemetry beds for patients whose heart functioning must be closely monitored. Patients assigned to the resident service are placed in the same

wards as those patients assigned to the hospitalist service. Likewise, nurses that oversee patients for one service also oversee patients for other services.

3.2.1.3 Surgical Services

Although the research reported here does not include observations on surgery services or an analysis of admission handoffs between the ED and Surgery, a brief overview of Surgery is provided for context. The Memorial Hospital Department of Surgery is divided into a number of adult surgical services, including Cardiac Surgery, Maxillofacial Surgery, Plastic Surgery, Thoracic Surgery, Vascular Surgery, and General Surgery. There are more than 100 surgical residents on staff each year. While the makeup of each service may vary, in general the surgical services consist of attending staff surgeons, a chief resident, a senior resident, a second-year and two first-year residents, and several medical students.

3.2.1.4 Clinical Information Systems

The hospital and associated health care system uses three web-enabled electronic clinical information systems. “MedRec”⁹ is the main electronic health record (EHR), containing clinician notes, lab and test results, radiographic images, and other basic patient information. “EDCentral” contains records pertaining to a patient’s ED stay, such as nurse triage notes, admission requests, and a “flowsheet” of time-stamped activities undertaken in the ED. “OrderCentral” is a computerized provider order entry (CPOE) system through which physicians issue orders for the administering of medications and therapies for the care of patients. The three systems are essentially separate and have limited interconnectivity.

⁹ Aliases have been used for the clinical information systems.

3.2.2 Participants

Clinicians participated in this study by any of three methods: interviews, observations of their work, and recordings of handoff conversations. A detailed discussion of these methods follows in Section 3.3. Here, I provide a description of my sample.

Table 3.1 Participants

Unit	Emergency Department			Internal Medicine			Surgery		Other	Total Participants
Participant Position	Attendings	Residents	Physician Assistants	Attendings	Residents	Fellows	Attendings	Residents	Administrators	
Total Unique Participants	13	27	4	17	10	1	1	4	9	86
	44			28			5		9	

A total of 86 clinicians, including several in administrative positions, participated in this study. Table 3.1 provides a summary of these participants. In some respects these numbers under-represent my observations. In the course of observing, I naturally saw and spoke with many other clinicians moving about the hospital in a variety of roles. Often these individuals would engage me about my work and offer stories from their own experiences. Furthermore, in shadowing one physician, I naturally observed the many other clinicians with whom that participant interacted in the course of his or her work. These additional conversations and observations contributed to my familiarity with the setting and my understanding of the work I studied. However, because I was neither interviewing nor shadowing these individuals in a formal capacity, I have not included their numbers in the tally of participants.

In choosing participants, my intent was to include a mix of physicians (residents and attendings) in the two units (ED and General Medicine) in which I was primarily interested. However, the totals for unique participants may appear less evenly distributed. For

instance, a total of 44 ED physicians participated, but only 28 General Medicine physicians did. This can be explained by two factors: differences in the distribution of admission work in the two settings, and my data collection methods. First, during any given shift, there may be a dozen or more residents in the ED who are admitting patients; however there is only one General Medicine resident and one hospitalist receiving new admissions for their respective services at any given time. Second, given the limitations of the equipment I was using to record handoff conversations, I could only record from the inpatient side. Therefore, during any given observation, I would typically record multiple handoffs received by a single General Medicine physician, but each handoff would be made by a different ED clinician. Together these factors contributed to a greater number of ED physicians participating than General Medicine physicians.

My sample includes a fairly diverse mix of individuals: interns through fourth-year residents and first-year attendings through seasoned veterans, some with more than 20 years of experience. A total of forty females and forty-four males participated. This balance was roughly preserved across the various units represented: ED = 21 females and 23 males; Internal Medicine = 11 females and 17 males; Surgery = 2 females and 3 males; Administrators = 6 females and 3 males.

Participants were recruited by multiple means. Initially, a contact within the hospital introduced me through email to physicians with administrative responsibilities in the ED and General Medicine services. These administrators then helped me identify a few physicians for an initial round of interviews and observations. These initial contacts were made via email exchanges. Additional emails were sent out several different months to the residents working in the ED and the General Medicine services inviting them to participate. Finally, several residents and attending physicians that I met while observing other physicians volunteered to participate as well.

3.3 Data Collection

I collected a variety of qualitative data using multiple methods. Each method provides access to different aspects of the phenomena of interest. Together, they enable me to assemble a more complex understanding of the communication and coordination work involved in admission handoffs. My data collection methods include: semi-structured interviewing, observations, and recorded handoff conversations. I also briefly examined the hospital’s clinical information systems.

Table 3.2 Data Collection Efforts by Participation¹⁰

Data Collection Method	Emergency Department			Internal Medicine		Surgery		Other	Total Participants
	Attendings	Residents	Physician Assistants	Attendings	Residents	Attendings	Residents	Administrators	
Interviews [total] ¹¹	9 [11]	5	0	10 [11]	7	1	4	9	45 [48]
Observations	4	18	0	14	8	0	0	0	44
Recorded Handoffs	6	28	4	12	5	0	0	0	55

Table 3.2 provides an overview of my data collection efforts, showing the number of participants involved in each collection method. Clinical documentation is not listed in the table because no additional participation was involved.

¹⁰ Several clinicians participated in more than one method of data collection, therefore, column totals are omitted to avoid confusion. For complete totals of participants by rank and service, see Table 3.1.

¹¹ Forty-five clinicians and clinician-administrators participated in a total of 48 interviews. Three individuals (one Internal Medicine attending and two ED attendings) participated in two interviews each. Bracketed numbers indicate the total number of interviews in categories where some participants were interviewed twice.

3.3.1 Semi-structured Interviews

Interviews are a useful method for gathering data about the meanings people ascribe to events and the sense they make of their world. Interviewing also helps the researcher tap into the concerns participants have and the challenges and problems of which they are aware. I relied heavily on semi-structured interviewing early on in my study as a means to begin understanding the issues that my participants felt were important to admission handoffs. Initial themes that emerged from these interviews provided direction for subsequent observations. In the spirit of theoretical sampling (Charmaz, 2006; Glaser & Strauss, 1967), however, I continued to conduct interviews throughout the duration of the study as needed to provide additional details or further insights into what I was learning. Interviews proved particularly useful again near the completion of my analysis when I used them to get feedback from participants regarding my interpretations. The first interview was conducted in January 2009; the last interview was conducted in March 2011.

At the beginning of the study, I developed protocols of questions to ask of interview participants. I prepared different protocols for ED and General Medicine participants, and included some different questions for residents and attending physicians. These protocols were helpful for the development of my initial analysis, but the particular questions asked from one interview to the next began to vary as that analysis developed and was refined. Thus, following the logic of theoretical sampling, after an initial round of interviews, questions for subsequent interviews were selected based on the themes I was exploring at that point and the aspect of my analysis I was attempting to refine.

This has important implications for the reporting of my findings. Namely, since all participants were not asked the same questions, and the topics of concern varied over the course of the study as the analysis proceeded, it would be inaccurate or misleading to report findings in terms of numbers or percentages. I cannot, for example, report findings in the

form of “32 out of 47 physicians said ‘X.’” To be clear, my intent in this study is not to make claims based primarily on frequencies. Rather, my intent is to capture a diversity of perspectives and concerns relevant to the phenomena of interest to enrich our understanding. I have attempted to keep my use of vague quantifiers (e.g., “some,” “few,” and “many”) to a minimum when reporting my findings, since some suggest these can create ambiguity for readers (Sandelowski, 2001).

During the interviews, I took brief notes, mostly of key phrases or words that participants used. In general, I attempted not to interrupt participants but used the notes as reminders for follow-up purposes. I employed various prompting techniques to encourage participants to provide further details on issues of interest (e.g., “Tell me more about [topic]”, and “What do you mean by [term]?”). In an attempt to gather rich data, I also prompted participants to provide specific examples where possible to illuminate topics they were discussing and to ground their perspectives in concrete examples.

Table 3.3 Interview Participation

Unit	Participant Position	Number
ED	Attendings	11
	Residents	5
Internal Medicine	Attendings	11
	Residents	6
	Fellows	1
Surgery	Attendings	1
	Residents	4
Other	Administrators	9
Total		48

I conducted 48 interviews with a total of 45 participants. Three attendings (2 in the ED and 1 hospitalist) were interviewed twice. Table 3.3 provides a breakdown of interview participation.

Interviews with ED and Internal Medicine physicians were used to understand the admissions process from the perspectives of those two specialties. Interviews with

surgeons offered insight into surgical consultations in the ED and how the surgery services operate. Interviews with hospital administrators provided additional information about and perspectives on nursing work, hospital bed coordination, residency programs, and hospital policies.

Interviews lasted about one hour on average. I conducted these interviews in a variety of locations, depending on the participant. Typically, interviews were conducted in the participant's office, a small conference room, or some other private location, usually within the hospital. My intent was to find a quiet location where the participant would feel comfortable talking without concerns of interruptions or of being overheard.

I used a small digital recorder to record the interviews. Informed consent was first obtained from each participant, including consent to participate in the study and to be recorded. As part of the informed consent, I promised to de-identify all data so that participants would not be directly identifiable.

All interviews were subsequently transcribed verbatim. I personally transcribed six of the interviews and then employed two different professional transcriptionists to transcribe the rest of the interviews. I subsequently edited all interview transcripts while listening to the interview recordings to double-check the transcription.

3.3.2 Observations

In order to understand the work of physicians and the physical, social, and organizational contexts in which that work is accomplished, I conducted observations of resident and attending physicians in the Emergency Department and in the General Medicine hospitalist and residency services. During these observations I shadowed and interacted with physicians but did not directly participate in clinical activities. The duration of each observation varied. When possible, I observed for all or a significant portion of an entire shift. My goal was not just to observe handoffs, but rather to develop a broader sense

of the work of physicians and to understand how admission work is embedded in many other processes and how admission work is shaped by other kinds of work. I obtained informed consent from the clinician I was observing at the start of the observation.

I attempted to split my time roughly equally between the ED and the General Medicine services in the interest of gathering deep understandings of both settings and their unique perspectives on the admission process. I conducted a total of 349 hours of observations between January 2009 and June 2010. I intentionally selected observation opportunities during different shifts, on different days, and during different months throughout the year in order to maximize my exposure to a variety of experiences and challenges facing physicians engaged in admission handoffs.

I observed a total of 46 different physicians. Eleven of these I shadowed on more than one occasion, largely because they were especially open about their thinking and practices. The distribution of the eleven is as follows: 5 hospitalists, 3 General Medicine residents, 1 ED attending, and 2 ED residents. Of these eleven participants, I observed eight on two separate occasions each. The other three participants—all hospitalists—I observed on three separate occasions each. The total numbers of participants involved in observations are presented in Table 3.4.

Table 3.4 Observations Participation

Unit	Participant Position	Number of Participants	Hours
ED	Attendings	6	57
	Residents	16	89
General Internal Medicine	Attendings (Hospitalists)	14	108
	Residents	10	95
Totals		46	349

There are a few benefits from observing the same participant on more than one occasion. First, the rapport established between researcher and participant during the first

observation is carried over to subsequent observations. The relationship picks up where it left off and less time is needed to “break the ice.” Second, subsequent observations provide an opportunity to follow up on any unresolved patient cases encountered during the previous observation. Third, gathering a larger amount of data on a single participant provides more insight into intra-participant practice variation and allows certain action patterns to be made more apparent than if less data were available.

When observing I carried a small notebook with me in which I briefly recorded salient cues that would help me recall details later when writing more extensive field notes. In my notebook I generally would record both events and the time that they happened. In a number of cases I also wrote down quotes verbatim. Since I did not follow clinicians into patient rooms, I took advantage of these and other brief breaks to record additional details in my notebook.

My field observations also afforded me many opportunities for informal interviews with the physicians I was following or other clinicians working nearby. At times these were brief exchanges in which I asked a question about something I had observed. At other times, when the pace of work was a bit slower, these exchanges were longer and would cover topics beyond what I had immediately observed. I made notes about these informal interviews in my notebook as well. I also carried my digital recorder with me, and on a few occasions I was able to use it to capture these informal interviews. I would later transcribe these recordings into my field notes.

Although my observations involved following one clinician at a time, other staff, including physicians, nurses, clerks, ED technicians, and Physician Assistants, often asked me about my study and volunteered information or their perspectives, typically without any prompting on my part. These exchanges I also recorded in my notebook.

At the conclusion of each observation, I used the notes recorded in my notebook to type up more detailed field notes, drawing from my own memory. In order to ensure that important details were not lost, I wrote up field notes immediately after leaving the field or the next morning. These single-spaced typed field notes total more than 220 pages. In my various note taking, I did not use individual's names or personal identifiers, but used participant ID numbers that I assigned. I use these same ID numbers when quoting participants in this dissertation.

What I recorded in my notebook and field notes varied from observation to observation, depending in large part to what aspect of my analysis I was developing at that point in time. Of course, anything that struck me as surprising I recorded, as well as anything that my participants appeared to have a strong reaction to. Thus, if an event elicited a noticeable affective response, I took that as a cue that I should gather more details about it. As I continued to gather data and develop my understanding of the actions entailed in admitting patients, it became easier for me to notice actions that were out-of-the-ordinary, such as steps I had not observed other physicians taking, obstacles I had not seen others face, or actions omitted that I had previously seen happen almost routinely. I made note of such actions, and when possible, followed up later with questions to gain a deeper insight into what I had observed.

3.3.3 Recorded Handoff Conversations

Admission handoffs at Memorial Hospital happen over the telephone. Thus, when observing in either the ED or in one of the General Medicine services, I only had access to one side of the handoff conversation. To better understand the interactive and negotiation aspects of such conversations, I wanted to be able to analyze the handoff conversations themselves. After my observations were underway, I obtained permission from the

Institutional Review Board and the ED and the Internal Medicine Department to record admission handoff telephone conversations.

I used a portable telephone tap¹² to connect my digital recorder to standard handset telephones used in the offices of the General Medicine services. I carried this equipment with me and recorded a total of 48 handoff conversations between ED physicians and General Medicine hospitalists and residents between November 2009 and June 2010. I only recorded handoff conversations that happened while I was conducting observations in the General Medicine services because the phone tap equipment was not compatible with the cordless phones which ED physicians at Memorial Hospital regularly use.

Verbal informed consent of both handoff parties was solicited at the start of the handoff conversations. I provided a brief IRB-approved statement to the General Medicine physician whom I was shadowing. That individual then read the statement to his or her ED counterpart at the start of the handoff conversation. If the ED physician consented, the call was recorded. On only two instances did parties—both ED physicians—refuse to allow their conversations to be recorded.

All recorded handoff conversations were transcribed by a trained medical transcriptionist. I then reviewed these transcriptions while listening to the recordings, editing as necessary and removing any details that would make the patient, the handoff participants, or other parties identifiable.

3.3.4 Clinical Documentation

Developing a rich understanding of information work, usually entails gathering some insight into the tools and documentation used in that work. Throughout my observations, I watched as physicians both created and used documentation, including in paper-based and electronic forms. My participants often showed this documentation to me

¹² JK Audio QuickTap Telephone Handset Tap (<http://www.jkaudio.com/quicktap.htm>).

in the course of explaining their work, and I made notes about such documentation in my field notebook.

In particular, I gained approval from the hospital to access the various EHRs. While I was able to witness the use of these systems during field observations, being able to explore the systems myself provided me a better understanding of their functionality and of the kinds of information and data they contain. My goal in accessing these systems was not to study the systems themselves, nor to analyze the data they contain. Rather, my examination of clinical documentation systems was intended to offer context for understanding the interactions I was observing between physicians and such systems.

3.4 Data Analysis

Qualitative studies such as this one produce voluminous amounts of textual data. As noted above, my typed single-spaced field notes totaled more than 220 pages. The interviews resulted in more than 400 pages of transcription. The recorded handoff conversations produced another 50 pages of transcribed conversations. Beginning data analysis early in the research process and continuing to analyze data as it is collected is a useful way of dealing with such a large amount of qualitative data. Specific processes were needed, however, to ensure data were carefully analyzed for valuable insights. In this section I talk about how I analyzed my data and developed a conceptual understanding of the situated, multi-functional nature of admission handoffs. I organize this discussion around three practices that were central to my analytical work: immersion, coding, and memo writing. I discuss these three practices one at a time, but this should not be taken to mean that they were sequential steps. Rather, they were overlapping and, at times, iterative. I conclude the section with a sub-section on considerations of how the emerging theoretical analysis might be evaluated.

3.4.1 Immersion

Immersion is my process of carefully reading and re-reading through my data, allowing myself to better absorb it, process it, and retain it. I read over my field notes and the transcripts of the interviews and recorded handoff conversations multiple times. On occasion, I also listened again to the recordings of the interviews and handoffs while reading in order to consider how meanings might be communicated through sounds such as inflections and tone of voice. I also returned to various notes and transcripts to reread them weeks or months after I first produced them. Since my analysis was emerging and evolving, I would sometimes see the data in a new light or notice details I had not appreciated in prior readings.

This practice helps in several ways. First, immersion generates familiarity. Although I conducted all interviews and observations myself, reading over the notes and transcripts multiple times had the effect of decreasing the likelihood that some small details would be missed altogether. If overlooked on one reading, they might be noticed on another reading on a different day when my mind was focused differently.

Second, immersion aids recall. Having read over notes and transcripts multiple times, I would often be able to recall a particular phrase or example as needed and usually remember which interview or observation it came from.

Third—and building on the second point—immersion helps in the identification of patterns within the data, an important part of theorizing and other conceptual work. Because immersion aids recall, details from previously collected data which seemed of minor importance at the time, can more easily be remembered and reinterpreted in light of newer data.

3.4.2 Coding

Simultaneously with immersing myself in the data, I also engaged in coding: naming segments of data with a label that both categorizes and captures some essence of that segment (Charmaz, 2006; Saldaña, 2009). Coding enabled me to make note of interesting phrasing and thought-provoking passages. It allowed me to sort and resort my data and to retrieve data from across different interviews and observations to compare similarly coded instances side-by-side. Two phases of coding were important for my analytical work: initial coding and focused coding.

3.4.2.1 Initial Coding

Initial coding is an open-ended process used to generate many concepts and topics that on first pass through the data appear to be important. I coded all interview transcripts and field notes initially using in vivo and process coding. In vivo codes are developed from the terms or phrases used by participants (Saldaña, 2009). By using the words of participants, I kept myself grounded in their terminology rather than imposing the language—and by extension the logic—of existing theory on the phenomena I was studying. Grounded Theory proponents encourage the use of this approach (Charmaz, 2006; Corbin & Strauss, 2008). Both social constructionism and symbolic interactionism stress understanding how people interact with and make sense of their worlds, so using in vivo terms is in keeping with these perspectives. Some examples of in vivo codes that proved useful were “reputation,” which I used to code passages where clinicians talked about how reputations may enter into or be affected by negotiations, and “chart biopsy,” a practice described in Chapter 4.

Similarly, process coding is appropriate for a social constructionist and symbolic interactionist approach where the emphasis is on understanding *how* actions are interpreted and *how* knowledge and reality are constructed. Process coding favors the use

of gerunds when coding, focusing on identifying the actions that participants are taking (Charmaz, 2006; Saldaña, 2009). Some examples of process codes I developed and used were “selling” and “blocking”, each of which were used in the analysis presented in Chapter 5.

The length of each passage coded varied. In some cases, only a phrase was coded, in other cases an entire paragraph or more. Some passages I coded with a single code; others with multiple codes.

I used HyperResearch (v.2.8.3), a qualitative data analysis software application, for coding and storing my coded text documents. I did not use any automatic coding function. Rather I performed all coding manually myself. I did use the reporting tools in the software which allowed me to pull all coded material associated with a particular code or set of codes. I printed out a number of these reports on particular codes and read this material over. This approach was useful for analyzing patterns across interviews and observations.

3.4.2.2 Focused Coding

Initial coding produced well over 200 different codes; however, some of these proved to be used infrequently, while others were very closely related or overlapping. As my data began to accumulate, my sense of what was most interesting or important began to emerge through the processes of immersion and initial coding. Focused coding is the process of folding similar or related codes into slightly more general or abstract codes (Charmaz, 2006). It is, therefore, an important step away from the descriptive toward the theoretical.

Focused coding relies on constant comparison, a hallmark method of grounded theory (Glaser & Strauss, 1967). I compared codes with codes, and developed categories that subsumed codes. This comparative work helped me define more clearly what I was seeing and to construct relationships between concepts that I had initially treated as

independent. For example, in Chapter 4 I argue that understandings of patients are constructed. This conceptualization comes from a category I labeled “Constructing an Understanding,” which emerged from focused coding. Several other codes (e.g., “getting a sense of the illness trajectory,” “baseline,” and “developing a differential”) were subsumed into this central category.

3.4.3 Memo Writing

While there certainly are elements of interpretation and inspiration in coding, there is also much about it that is mechanical (Schatzman & Strauss, 1973). To develop a grounded theory of what those codes and coded materials mean, the researcher writes memos (Charmaz, 2006; Corbin & Strauss, 2008). For me, memo writing is analyzing *through* writing. It is a way of asking questions of one’s data (Lempert, 2007) and serves as an intermediate step between early coding and drafts of papers (Charmaz, 2006). Memos helped me flesh out the skeleton of ideas contained in a code or set of related codes.

I wrote memos throughout much of the research process, but the focus and length of the memos changed as my analysis developed. Early memos were less than a page in length and simply captured some question that required follow-up or some connection I made between different statements participants had uttered. Some memos explored particular passages of data in more depth than codes alone could express. I also wrote memos that helped me think about my more intriguing codes—to identify what I knew about them and what gaps or questions remained to be explored in further data collection. Later memos drew together multiple codes into categories and provided what ultimately became initial drafts of sections of this dissertation.

Memo writing is an ongoing process, one that utilizes freewriting techniques (Charmaz, 2006). I wrote memos quickly, not deliberating over word choice, phrasing, grammar, and spelling, not worrying if I what I was writing was “right.” My goal was to

capture my thoughts at that particular moment on whatever particular topic I was addressing. I never rewrote memos. When my thinking developed further or changed, I simply wrote a new memo or made an amendment to an existing one. Later memos were often compiled in part from ideas contained in earlier ones.

Memo writing is important for developing theoretical insights. I found memos to be useful for constant comparison—working out the relationships between two or more pieces of data and between two or more codes (Glaser & Strauss, 1967). This in turn helped me get beyond merely describing my data, to think a bit more abstractly about what was going on.

3.5 Evaluation Considerations

Criteria for evaluating qualitative research differ from those used in quantitative studies. Two useful considerations for evaluating grounded theory are the credibility and resonance of the work (Charmaz, 2006).

First, considerations of credibility speak to the relative credibility, authenticity or trustworthiness of the work. As is characteristic of interpretivist work (Crotty, 1998), I do not claim objectivity. My analysis is *my* interpretation, constructed on what I have come to understand of my participants' perceptions of their worlds. My intention, however, has been to represent their multiple perspectives as authentically and as accurately as I could while simultaneously bringing my own insights.

I took several steps to ensure the credibility of this work. I triangulated different sources of data (e.g., interviews, observations, recorded handoff conversations) to capitalize on the strengths of each method while minimizing their deficiencies (Flick, 2007). I also intentionally sampled from a diverse set of participants (e.g., attendings and residents in both the ED and inpatient services). This allowed me to capture a variety of perspectives on a given issue. When writing memos, I intentionally sought out conflicting data, with the goal of presenting the natural variation that exists in a complex, socially-constructed world

(Corbin & Strauss, 2008). Finally I conducted this study over the course of more than two years. Prolonged engagement (Flick, 2007) allowed time for my own understanding of the field to mature and gave me opportunity to write and reflect on what I was learning.

Second, considerations of resonance speak to the degree to which the work makes sense to others who inhabit or study the world examined. I used in vivo coding in part because it helped to ground my initial thinking about phenomena in the language of the people I was studying and freed me from the preconceived categories of extant theory, which had to “earn their way” into my analysis (Charmaz, 2006). The iterative nature of my data collection and analysis methods, where one informed the other continually, meant that as I was developing my analysis, I was returning to the field to refine it by holding it up against the ongoing experiences of my participants. In addition to gathering additional data, however, this approach also allowed me to do member checking, in the sense of sharing my conceptual insights and getting reactions and feedback from participants (Flick, 2007). Interviews conducted in the final months of my work, while writing this dissertation, were particularly useful for this effort.

3.6 Conventions Used in Presenting Data

I have chosen to present many quotes and excerpts from my various data sources throughout the three findings chapters that follow. By providing longer passages of data, I hope to enable readers to see clearly the connections between my data and my interpretations of those data. I hope, too, that the inclusion of such data will allow readers to analyze the data themselves, to achieve their own insights, and to draw their own conclusions.

To make the included data more easily understandable to readers, I have used a few conventions, which I explain here.

Quotation marks. Double quotation marks (i.e., “”) indicate a direct quote. Some participant actually said the words quoted.

Emphasis. In some quotes, I use italics to indicate words that participants emphasized audibly when speaking if that emphasis is relevant to understanding their meanings. Any other use of italics or boldface type within quotations is noted with the following: [emphasis added].

Ellipses. Where I omit a word, phrase, or small portion of a sentence in a quote, I indicate this with an ellipsis. Longer omitted passages are indicated by an ellipsis enclosed in square brackets (e.g., [...]). In all cases I have endeavored to retain the original meaning of the quote.

Square brackets. In addition to their use with ellipses, I also use square brackets around words I have added to a quote to clarify meaning or to replace identifying information.

Block quotes. Block quotations are provided from all three sources of data: interviews, field notes, and handoff conversations. At the end of each block quote, I provide the ID number of the participant, his or her position and service, and the source of the data if it is not from an interview. For example: (P201, ED Attending, Field notes).

Participant ID numbers. To preserve the anonymity of my participants, I assigned them ID numbers which I used in all transcripts and field notes. All ID numbers begin with the letter “P” for participant. This is followed by a three digit number, the first digit of which indicates the hospital unit of the participant. A “1” represents General Medicine, including both hospitalists and residents. A “2” indicates the ED. A “3” indicates an administration position. A “4” indicated a surgical service. A “5” indicates the Pulmonary and Critical Care service. There is no significance to the last two digits.

Chapter 4

Constructing Understandings of Patients: Beyond Information Transfer

I feel like there's a lot more [to handoff] than just strict information flow. Because information flow—in general, if the Emergency Room's done something, you can find it. It's on [sic] EDCentral. You can find it and look at it. You can look at all the lab tests. You can see what tests they've done. You can look at them yourself if you want. I mean, *that's* not the issue. The issue is often why is this person coming to us? Is there a sufficient and corroborative enough story to tell me that? (P101, hospitalist)

4.1 Introduction

There is an important distinction to be made between pieces of information and a coherent, holistic understanding. While the latter is arguably composed from the former, it is at the same time something more: the whole is greater than the sum of its parts. This distinction between whole and parts is embedded in the hospitalist's words above. Clinical data points and other pieces of information about patients are readily available in the hospital's electronic health record (EHR). The holistic understanding, however, is harder to come by, but it is crucial to the ongoing work of diagnosing and treating patients. In this chapter, I explore the complexity of understandings of patients and how these understandings are formed in the work of physicians in and around the admission handoff.

The understanding a physician has of a particular patient is consequential for the subsequent care of that patient, as well as for the use of organizational resources. Diagnostic and treatment efforts are ordered based on what the physician knows or suspects regarding the patient's health. Different understandings may, therefore, lead to different actions. For

example, if a physician understands a patient to be in the early stages of a heart attack, the appropriate actions will likely involve hospitalization among other specific diagnostic and therapeutic efforts. On the other hand, if the physician understands the patient merely to be suffering from indigestion, an entirely different, less aggressive approach to care will be indicated. The two illnesses can have similar symptoms but require very different treatment. What is needed is a richer explanation of how such understandings are formed and what shapes them.

Investigating how physicians develop understandings of their patients is relevant to a study of handoffs because, arguably, handoffs are intended to play a key part the formation of such understandings. Admission handoffs, particularly in a large tertiary referral, teaching hospital, provide an ideal opportunity to study the formation of understandings of patients since the overwhelming majority of patients being admitted are handed off to physicians who have no prior knowledge of them. Thus, the physicians must begin “from scratch.”

Most reports of handoff research and improvement efforts characterize handoff as an information transfer activity. I will illustrate this by briefly discussing two lines of work: handoff standardization efforts and handoff measurement efforts. First, attempts to standardize include the development of handoff documents (Alem et al., 2008; Salerno et al., 2009), communication protocols (Haig et al., 2006; Talbot & Bleetman, 2007), and information systems (J. Anderson et al., 2010; Ferran et al., 2008; V. P. Patel et al., 2009). In addition, researchers have demonstrated the ability of information technology to automatically extract patient data from EHRs, thereby improving the accuracy and completeness of information transfer (Flanagan et al., 2009; Raptis et al., 2009). What these various efforts have in common is an attempt to structure the content of the handoff to ensure that essential information and important details are transmitted during handoff. In

other words, they conceive handoff as an information transfer activity that can be improved by reducing the likelihood that the party handing off might forget or neglect to pass information to the party receiving responsibility or control.

Second, although handoff measurement is a difficult task that has, as yet, largely eluded researchers (Cohen & Hilligoss, 2010; Jeffcott et al., 2009; Patterson & Wears, 2010), some have made initial strides in this direction. What they have measured is instructive: the completeness of information transferred (S. M. Evans et al., 2009; Maughan et al., 2010; Nagpal et al., 2010; Raptis et al., 2009; Salerno et al., 2009; Wayne et al., 2008), the accuracy of information transferred (Frank et al., 2005; Maughan et al., 2010; Wayne et al., 2008), and the retention of information by the receiving party (Bhabra et al., 2007; Pickering et al., 2009; Talbot & Bleetman, 2007). As with standardization efforts, these various measurement efforts all share a common conception of handoff as an information transfer activity in which the primary objective is to transmit and receive specific information items.

Figure 4.1 Information Transfer Model of Handoff

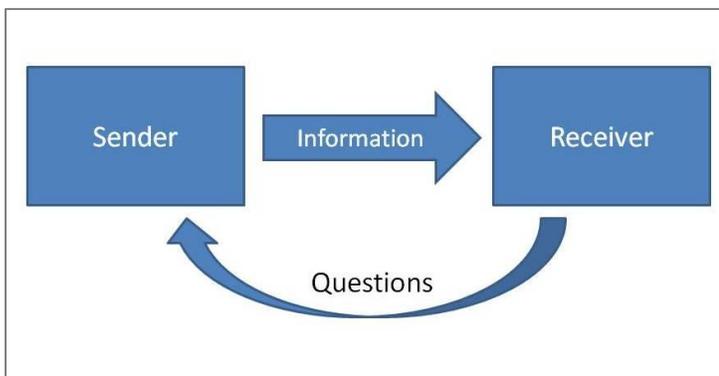


Figure 4.1 represents the conceptual model of handoff as an information transfer activity—the model implied by much of the reported research and improvement efforts. It is implicitly derived from Shannon’s (1948) model of a general communication system. There is a sender, the party handing off responsibility, who transfers information to a

receiver, the party receiving responsibility for the patient. The model suggests a largely one-way transmission of information; however, it includes an arrow looping back from receiver to sender, capturing the common advice that handoffs should include an opportunity for questions (Joint Commission, 2006a; Pillow, 2007; World Health Organization & Joint Commission, 2007).

Certainly the transfer of information is an essential component of handoff, and the various works cited in the preceding paragraphs have made valuable contributions to our knowledge. Nevertheless, conceiving of handoff solely as an information transfer overlooks the complex, multifaceted nature of the activity. As a result, we may miss further opportunities for improvement, and efforts based on such a conception may inadvertently produce unintended consequences. Toward the end of better understanding the complexity of handoff, we must first examine the deficiencies of the dominant model.

First, the information transfer model of handoff assumes information asymmetry—that is, that the party handing off holds most or all of the information about the patient. In settings where paper-based medical record systems are in use, admission handoffs often *do* entail considerable information asymmetry. Paper-based systems provide the party handing off a near monopoly on information. But how might EHRs be changing this? Because EHRs gather information about a patient across multiple episodes of care and increase accessibility of that information, EHRs have the potential to make admission handoffs more of a two-way conversation by making more information available to the receiving party before and during handoff.

Second, the information transfer model overlooks the relationship between pieces of information and coherent, holistic understandings comprised of that information—the whole versus parts tension mentioned earlier. To conceive of handoff as a largely one-way transmission of information is to make one or more assumptions: that the pieces

themselves constitute understanding; that the flow of pieces of information will naturally accumulate into an understanding; or that holistic understandings can be relatively easily conveyed from one individual to another. In short, the model neglects to consider the *work* involved in putting the pieces together to form an understanding.

Third, the information transfer model implicitly emphasizes the role of the party handing off responsibility while obscuring the role of the receiving party. In fact, it assumes or implies the receiving party is a passive recipient of information whose primary responsibility is to retain information (Bhabra et al., 2007; Pickering et al., 2009; Talbot & Bleetman, 2007). But health professionals are trained, knowledgeable individuals with some amount of experience on which to draw and actively contribute to handoff interactions. Furthermore, as the party assuming responsibility for the care of the patient, they have a high stake in the handoff. Most research, however, has overlooked the role of the receiving party.

Fourth, characterizing handoff as an information transfer activity overlooks the influence of situational and organizational factors. Handoffs are interactions embedded in particular organizational contexts, carried out within dynamic situations that may involve clinicians of variable experience and expertise communicating about patients which are also variable. Shannon's (1948) model accounted for a noisy channel through which information is transmitted, thus allowing for degradation or loss of information. Within the literature on handoffs, acknowledgment of this noisy channel can be seen in studies that warn of complications caused by interruptions and other distractions in the surrounding physical environment (Coiera et al., 2002; Laxmisan et al., 2007; Lyons et al., 2010). Typically, the advice is to conduct handoff in a quiet location (British Medical Association et al., 2005; Solet et al., 2005). But there are many situational and organizational factors that may bear upon handoff communication beyond ambient noise. A few have noted that the hierarchies

of medicine and differences among handoff participants can impact effective communication (e.g., Solet et al., 2005; Williams et al., 2007).

We need a conceptualization of handoff that acknowledges the situated, multi-functional nature of the activity. We need to account for the fact that the distribution of information among the parties engaged in handoff can vary considerably, particularly given the growing use of EHRs. We need greater insight into the work of understanding patients, into how pieces of information become assembled into a holistic understanding and the factors that influence this assembling. We need a conceptualization of handoff that better accounts for the role of the party receiving responsibility in transferring and assembling information. Finally, we need a model of handoff that acknowledges the role of situational and organizational influences. Social constructionism suggests a potentially useful new way of conceiving of handoff and, more broadly, of the work and nature of understanding patients.

Social constructionism is a sociological theory of knowledge which asserts that humans construct meaning and reality through their social interactions in the world (Berger & Luckmann, 1966). It has its roots in phenomenology (Husserl, 1963), but can be seen in the works of the American Pragmatists (Dewey, 1922; W. James, 1961; Mead, 1934), symbolic interactionists (Blumer, 1969; Strauss et al., 1963), and various contemporary theories, including structuration (Giddens, 1984), and sensemaking (Weick, 1979, 1995).

Social constructionism offers an alternative to objectivist theories of knowledge in that it holds that meaning does not exist in “things,” independent of the thinker. From the constructionist perspective, then, meaning is not discovered but constructed. To construct is “to make or form by fitting the parts together” (Oxford English Dictionary, 2nd ed., online). There are four aspects to which we should attend when trying to understand construction. First, missing from the definition but important for our analysis, is the actor who takes

action—the constructor. Here we must consider both the individual and the social collective. Second there are the actions involved in “fitting” the parts into a whole. Third, there are the “parts” used in the construction. Finally, there is the thing constructed—that which is formed.

Actor must be conceptualized as both the individual and the social collective. The individual plays a key role in the constructing¹³, but the resulting construction is not fully subjective. All such constructing occurs through various kinds of interactions and within specific social contexts, where particular cultural norms and resources are influential in shaping the constructing. The individual mind emerges within and cannot be seen apart from social processes (Mead, 1934). Even our solitary thoughts display evidence of social interaction (Blumer, 1969; Weick, 1995), and individual habits are shaped by collective custom (Dewey, 1922). Furthermore, individuals act not only as individuals but also as representatives of their collectives, embodying the norms, values, assumptions, customs and perspectives of those collectives (Chatman et al., 1986). For our purposes, the takeaway is that if we are to gain insight into the processes by which understandings of patients are constructed, we must be attentive both to the agency of the individual clinician and the social collective that informs and contributes to the constructing.

Pragmatism, symbolic interactionism and sensemaking all share an emphasis on action and process. What people know and what they take as reality are tightly intertwined with the actions and interactions in which they engage in the world (Blumer, 1969; Dewey, 1922; Weick, 1979). Actions enact worlds people only retrospectively understand (Weick, 1979). Therefore, if we are to appreciate the understandings clinicians hold of their patients, we must examine the actions that led to those understandings.

¹³ I should acknowledge that some use the term “social constructivism” when addressing the actions of individuals with respect to the construction of social realities. See Crotty (1998) for a discussion of these two related terms.

An understanding is constructed from parts. In sensemaking those parts are cues: action is focused on and by extracted cues (Weick, 1995). The environment presents a continuous flow of stimuli from which the actor notices, extracts, and embellishes cues. The question then is why are particular cues noticed while others are not? Context appears to play an important part in this noticing (Weick, 1995) as do the specific goals actors are pursuing (W. James, 1961). Cues that are taken to be relevant are extracted for use in making sense. Finally, cues are embellished, that is, particular, concrete observations are conceptually linked to more general, abstract ideas or knowledge structures in the interest of constructing sense. The concept of abduction developed by American Pragmatist Charles Sanders Peirce provides a way of thinking about the action of embellishing cues. Abduction is proposed as a means of reasoning by which a person infers an explanation for an observation. It is devising a theory to explain facts. Peirce expressed abduction this way:

The surprising fact, C, is observed;
But if A were true, C would be a matter of course,
Hence, there is reason to suspect that A is true. (CP 5.189, 1903, as cited in Houser, 1998)

Cues are noticed and abstracted in part because something about them caught the sensemaker's attention (Weick, 1995). Abduction is the inferential process by which a person produces a hypothesis, hunch, guess—various terms have been used—to explain the surprising observation, the extracted cue “C.” In Peirce's example, the sensemaker works backwards to abduce that “A” may be true since it would explain the cue. While certainly not infallible, the capacity of humans to “guess” effectively appears to be far better than what pure chance would produce, giving rise to questions about the roles of instinct and habit in abductive inference (Paavola, 2005).

A final component of construction to consider is the thing constructed. Here we are concerned with the understanding a physician constructs of a patient. Two important points with respect to constructions follow from a social constructionist perspective. First, because

parts may be assembled in different ways to create different wholes, multiple, competing meanings and realities may be constructed. As resources, norms, interactions, and individual characteristics vary, the understandings constructed will also vary (Berger & Luckmann, 1966). Second, the emphasis on process and the view of reality as an ongoing, continuously enacted accomplishment (Weick, 1995) implies that constructions will look different depending on when in the process we see them, as well as depending on when various cues are encountered and embellished.

A small group of scholars have argued that handoffs involve the co-construction of understanding and shared mental models (Behara et al., 2005; Bruce & Suserud, 2005; Eisenberg et al., 2005; I. James et al., 2010; Perry et al., 2008). Some empirical evidence backs up these arguments. For example, one study of sign-outs in five hospital emergency departments found that handoffs were joint constructions and never “data dumps” (Behara et al., 2005). Constructing understandings of patients has been shown to draw on multiple activities (I. James et al., 2010) and become more difficult when patients are more medically complicated or ambiguously diagnosed (Bruce & Suserud, 2005). Furthermore, although the development of a holistic understanding often relies on stories (Montgomery Hunter, 1991), Eisenberg and colleagues (2005) found that narrative rationality is often subjugated to communicating actionable lists. These various studies have taken important first steps to demonstrate that the construction of understandings is a valuable alternative to the information transfer model when thinking about handoffs. Nevertheless, there remains much that we do not yet know about the processes involved in constructing understandings, the components from which such understandings are built, and the roles that various situational and organizational elements play in these processes. The study I report here is intended to help address that gap.

In this chapter I provide findings and discussion that address all of my research questions outlined in Chapter 1. The central question with which I am concerned here, however, is: *How do physicians come to have particular understandings of their patients, and of what are these understandings comprised?* Additionally, I explore how EHRs are used in the processes of understanding patients and in preparation for handoff. I also give considerable attention to the role of the party on the receiving end of handoff since it is often this individual who has the most constructing to do during an admission handoff. In addressing these various issues, I provide insight into handoff practice variety and deepen our knowledge of the situated, multifunctional nature of handoff.

The remainder of this chapter is divided into four main sections. First, I provide an analysis of four important building blocks used in constructing understandings of patients. Second, as noted, electronic health records appear to be having an important impact on the process of constructing understandings of patients, particularly with consequences for admission handoff interactions. Thus, I explore the role of EHRs and the emerging practice of pre-handoff *chart biopsy*, the selective examining of a patient's medical record prior to taking handoff. Third, I examine constructing as a process, highlighting the actions involved in assembling information, over time, into an understanding. Fourth, I discuss the contributions and implications of this chapter.

4.2 Building Blocks of an Understanding

To conceive of understandings of patients as constructions begs the question of what are these constructions built? What are the parts or elements used to form understandings? Certainly pieces of information and clinical data points are useful elements, but the specific pieces of information needed to understand a particular patient will likely be different than those needed to understand a patient suffering from a different illness. Creatinine level is an important data point when constructing an understanding of a

patient who has kidney failure, but that measurement may be less informative when constructing an understanding of a patient who is suffering from a gunshot wound in the arm. Slightly more abstract concepts are needed.

Much of this section is devoted to four building blocks used in constructing understandings of patients. Before turning to these four, however, I should note that a crucial starting point for understanding a patient is some action that identifies the patient. Some identifier or set of identifiers—name, age, EHR ID number, bed or room number, chief complaint, etc.—provides a starting place for organizing the construction of understanding. In the ED, this may come to the physician on the triage sheet provided by the nursing staff or from a fellow physician who signed out the patient at start of shift. In General Medicine, this information may also come at sign-out or be contained in the text of the admission page sent by the ED physician, among other possibilities. Handoffs typically begin with such orienting identifiers: “Mr. [patient name] is a 55-year-old. He has a history of alcohol abuse with alcohol withdrawal and DTs in the past.” Identifiers are useful in the ongoing work of constructing an understanding for assessing whether or not additional information encountered pertains to the patient in question.

In this section I identify and discuss four building blocks that appear to be crucial to understanding patients, at least within the context of hospital admission handoffs. The four building blocks are: illness trajectory, baseline, care trajectory, and rationale. Drawing examples from my observations in both the ED and the General Medicine services and from recorded handoff conversations, I demonstrate how these building blocks figure into constructed understandings.

4.2.1 Illness Trajectory

Illness trajectory is a concept that comes from Anselm Strauss and his colleagues (Strauss et al., 1997). It acknowledges the temporal aspect of illness. That is, over time a

patient's experience of an illness may change. Patients may get better. They may get worse. They may stabilize—their conditions continuing relatively unchanged for a time. Furthermore, the trajectory concept captures the ongoing, flow of experiences, acknowledging that illnesses involve sequences of interrelated and influencing events, actions and emotions. Strauss and colleagues include the organization of work to manage illness in their concept of trajectory; however, I find analytical value in separating out the diagnostic and treatment efforts intended to monitor and control the illness. This work I discuss below in the sub-section on Care Trajectories.

Physicians maintain an extensive knowledge of a variety of diseases and have access to resources for information about an even wider array of disorders and illnesses. Thus, to be clear, the physician is not primarily constructing an understanding of the illness, although the physician may learn something new about the illness in the process—something that will serve in future encounters with other patients suffering from the illness. Rather the physician is constructing an understanding of the patient and that patient's own particular experience of the illness.

While there are often common patterns characterizing a given illness, by no means do all patients suffering from a particular illness have the same experience of that illness. Neither do they all require the same treatment efforts. The relative severity of symptoms can vary from one patient to the next as can the speed with which the illness worsens or responds to treatment. The presence or absence of various co-morbidities—other illnesses occurring simultaneously but not necessarily directly related to the present complaint—also influences the trajectory of the patient's illness. Thus, an understanding of each patient's particular experience of illness must be constructed. In understanding a given patient's illness trajectory, physicians do, of course, draw from knowledge of common

patterns; however, the unique aspects of the particular patient's experience, circumstance, and history must be factored in.

Temporality typically calls to mind three general phases: past, present, and future. Getting a sense of a patient's illness trajectory, therefore, involves getting a sense of 1) what has happened with respect to the patient's experience of the illness so far; 2) where in the progression of the illness the patient is currently; and 3) what might be expected for the patient in the future. A patient's illness trajectory, then, cannot be easily conveyed by a single datum or measurement. Usually some narration work is required to piece together data or information into a coherent story, as demonstrated in the following handoff conversation excerpt.

ED Resident: [patient is] a 62 year old woman with metastatic lung cancer... She received chemo three weeks ago. It didn't seem to work, and right now she's not actively into going into any other treatments. They're kind of considering hospice versus like experimental therapies at this time. [...the patient] has some decreased appetite, so she's been only eating like soft like eggs for the past six months—

Gen Med Resident: Okay.

ED Resident: —and over the past week, she's noticed that it's taking her much longer to eat eggs. Like before she was able to eat two eggs, now it's like taking her an hour and a half to eat one egg—

Gen Med Resident: Okay.

ED Resident: —and then for the past two days, she's only taking in liquids. So yesterday and today, she, or for two days, she's taking half a protein shake per day. And this morning, she drank milk to take down her pills. [...] Basically, she's being admitted because she can't take ... sufficient [food]. (H48, P122, Gen Med Resident; P244, ED resident)

The ED resident attempts to convey her understanding of the patient's illness trajectory by providing a brief account of the long term trajectory of the patient's cancer as well as an account of particular recent events that directly led to the patient coming to the hospital. First, when the ED resident describes the lack of success of the recent chemotherapy and the patient's consideration of hospice, the resident is describing an illness trajectory of a terminal illness that is possibly entering its final stages. Second, by describing the changes in the patient's ability to take in food, the ED resident further conveys the patient's illness

trajectory, specifically that the illness is getting worse. Importantly, this negative trajectory is used as justification for the admission.

Getting a sense of the illness trajectory is itself a kind of construction process. This usually involves assembling data and information from different points in time to look for trends, as one General Medicine resident explained.

Anytime you look at a lab, like if I want to look at somebody's creatinine—that's a measure of kidney function—I can look at the one that they just got in the ED, but then you can click on it and they can show you every test that they've had in the system, and so you can look at their trend over time. That's helpful. If somebody's coming in with liver disease, you can look at their liver enzymes, but then it will also show you all of their previous numbers so you can know, 'is this worse than usual, same, better?' (P110, General Medicine resident)

Physicians sometimes complain that a handoff may provide a static picture, emphasizing the patient's current state, but having a sense of the trajectory of the illness over time provides a richer picture and better insight into the patient's case. In the example, the resident constructs his sense of the illness trajectory by drawing together lab data gathered at different points in time and looking for any trends that would suggest whether the patient is "worse than usual, same, better." There is a retrospective aspect to this constructing (Weick, 1995); the present is put into perspective in relation to what is known and perceived about the past. A single lab value or vital sign, gathered at one point in time can be difficult to interpret. It can take on greater significance when compared with similar data from another episode of care.

How long a patient has been experiencing an illness provides clues that are helpful for diagnosing and planning care.

Usually if somebody has something for 6 or 8 months, it changes your differential on what that might be. So, if they've been having pain for that long, it's unlikely to be something really scary. And so, like, if they have angina or heart disease, it probably hasn't been causing this much trouble for 8 months or they would've had a bigger problem by now. Or aortic dissection or something really scary, and so it's probably something very bothersome to the patient, because they obviously have had pain for this long, but it's probably not something that's so dangerous to them that it's going to kill them today. And so I think in our minds, it's kind of like, Okay, this has been

going on for 8 months; it's probably not anything dangerous to you. Why doesn't this get worked up with a Primary Care physician or something less acute than [in a hospital]? (P107, hospitalist)

The duration of the patient's symptoms provides insight into the relative acuity of illness and the likelihood that particular diseases may be causing the patient's problems. Thus, knowing details about the patient's illness trajectory is important for diagnosing and for deciding whether the patient should be hospitalized or could be safely treated in an outpatient setting. One term used by the hospitalist is worth clarifying here since it appears throughout the chapter. A differential diagnosis—or differential, for short—is a list of all possible diagnoses that might explain the symptoms a patient is experiencing. When attempting to diagnose a patient, doctors form a differential first, in part to avoid prematurely closing in on a single explanation. The work of developing a differential diagnosis is discussed in more detail in a later section of this chapter (see 4.4.1 Developing a Differential Diagnosis).

Illness trajectory is an important building block in the constructing of an understanding because knowing where a patient is in the trajectory has implications for what diagnostic and treatment efforts should be tried and is useful for predicting the future trajectory of the illness. In the context of admissions work, then, illness trajectory is useful in planning appropriate disposition: deciding whether or not the patient requires hospitalization, and if so, which service is best positioned to provide care.

4.2.2 Baseline

Constructing an understanding of a patient, including getting a sense of a patient's illness trajectory, often involves determining that patient's baseline condition. Baseline information provides insight into what is normal for the patient. As objective as some patient data might be, the meaning of that data is still, in some cases, relative. Often, a patient's information has to be put into perspective relative to that patient's own medical

history before the full significance of the information becomes evident. Patients with certain chronic conditions may regularly have vital signs or lab values that appear abnormal in the abstract, but which are fairly normal for those patients. Therefore, physicians need to know what is “normal” for *this* patient.

Baseline data is used to put current data in perspective, as in the following handoff excerpt.

Normally she’s on 4 liters [of oxygen] at home, and her baseline sats are 89 to 92. Um, she came in at 88 to 90 on 4 liters here. [...] Um, her creatinine’s 1.5 and we don’t have a baseline for it. (H42; P225, ED resident; P202, hospitalist)

Here, the ED resident has baseline data on the amount of oxygen the patient normally receives (e.g., “4 liters”) and her normal blood oxygen saturation (i.e., “sats”) levels. This information provides context for interpreting the patient’s current data, revealing that her current blood oxygen situation is normal. On the other hand, because no baseline data on the patient’s creatinine level is available, the ED resident is not able to put into context the patient’s current level of 1.5, which in the abstract would appear to be on the high end of normal, particularly for a woman. Having baseline information can be useful for reducing uncertainty.

Baseline data—and a patient’s past medical history information in general—is useful for identifying whether or not there has been a change in the patient’s condition; therefore, baseline data may be used to identify where attention should be focused. In the following handoff conversation, a 79-year-old woman experiencing shortness of breath is being admitted with congestive heart failure. The excerpt begins with the ED resident noting that the patient’s BNP¹⁴ is well above the patient’s baseline. This information triggers a conversation about what might have incited this change in the patient’s condition.

ED Resident: Her BNP’s 1100.

¹⁴ B-type natriuretic peptide (BNP) is a compound produced by the heart. Elevated levels may indicate heart failure.

Hospitalist: Yeah, I saw that. For her it's high, right?

ED Resident: Right, yeah, she's usually like 400 or 500.

Hospitalist: Was there any obvious inciting factor?

ED Resident: I can't—it doesn't seem like there's any clear indiscretion. Sounds like she's been compliant with her meds, you know. Her daughter was here. It sounds like she's pretty on top of her history. So, you know, her dig level's low too. I'm just seeing on the labs. Probably could be bolstered a little bit to .3.

Hospitalist: Let's see.

ED Resident: But I did rectalize her with a history of GI bleed, and it's negative. And her hemoglobin's 8.7, which is pretty much right at her baseline, so it doesn't look like that's the precipitating cause.

Hospitalist: Right. (H44; P234, ED resident; P104, hospitalist)

Together the two physicians engage in co-construction. The hospitalist asks a question (i.e., “Was there any obvious inciting factor?”), triggering abduction, that is, prompting the ED resident to work backwards in search of a plausible explanation for the significant increase in the patient's BNP level¹⁵. Irregular use of medications would be one explanation, but the resident has information to provide that appears to make such an explanation unlikely in this patient's case. The ED resident does note that the patient's digoxin (i.e., “dig”) level is low, indicating that the patient may be low on a particular steroid used to treat certain heart conditions. Apparently, the resident is just noticing this low digoxin level as he relays the information (i.e., “I'm just seeing on the labs”). This provides an example of co-construction, of the socially interactive nature of making sense of patients. The ED resident has been prompted to look more closely at the lab results in an effort to answer the hospitalist's question about an obvious inciting incident. The hospitalist likewise communicates that he is actively engaged in fitting the pieces of information together, looking at the lab results himself, when he responds, saying, “Let's see.”

Continuing to search for an answer—something to explain the abnormal BNP level—the ED resident provides two additional pieces of information. The rectal exam (i.e.,

¹⁵ The ED resident may, in fact, simply be re-telling his own earlier attempts to infer an inciting incident; however, he may also be actively trying again during the conversation to come up with a plausible explanation, going back over previous reasoning in search of an explanation that previously evaded him.

“I did rectalize her”), potentially important given that the patient has a history of gastrointestinal (GI) bleeding, was negative. Likewise, the patient’s hemoglobin at 8.7 is a bit low in the abstract, but apparently normal for the patient. In other words, she does not appear to be bleeding now; therefore, the resident is suggesting a GI bleed is perhaps not the cause of her elevated BNP. This illustrates that the activity of “ruling out” potential diagnoses is part of the work of arriving at a plausible explanation.

The previous examples portray baseline data as quantitative data, but information about a patient’s baseline can also be presented in qualitative form, sometimes using subjective measures as the following illustrates.

So a 76 year old gentleman with a history of COPD.... He developed a fever today of 104 and was more shorter [sic] of breath than usual. [...] His chest x-ray shows a worsening right lower lobe infiltrate with effusion. He’s had frequent bouts of pneumonia in the past, and it’s usually the same findings on chest x-ray, but this is worse than previous x-rays have been. (H47; P235, ED attending; P104, hospitalist)

Two different aspects of the patient’s baseline are presented in this handoff excerpt. First, the ED attending notes that the patient is more short of breath than usual. Being short of breath is normal for this patient, and for patients with chronic obstructive pulmonary disease (COPD) in general; however, the attending indicates that the patient’s recent breathing problems are qualitatively worse than what he normally experiences. Second, the attending also states that the patient’s current x-ray “is worse than previous x-rays have been,” suggesting that there has been a change for the worse in the condition of patient’s lungs. In both cases, the baseline data is vague, but they are nevertheless useful in painting a picture of a patient whose normal state of health includes some symptoms and indicators of illness and whose present state of health suggests a worsening of those symptoms and indicators.

Clearly there is a connection between baseline and illness trajectory. Baseline data are historical data that are used to contextualize more recent data. Baseline data provide

reference points in the past that are useful in constructing a story about the progression of the patient's illness trajectory.

Determining a patient's baseline and evaluating how the current condition compares with that baseline is part of what some doctors refer to as the "sick versus not sick" designation. Of course, nearly all of the patients who come through the ED have some genuine complaint, but some are not "sick" enough to warrant an admission while others are so "sick" as to need a level of care such as can only be provided in a critical care unit or by a sub-specialist. One ED attending explained this in an interview.

And in emergency medicine, a big part of what we do is, 'are you sick or are you not.' And by sick I mean big sick. I'm not talking about strep throat sick. Are you *really* sick? Do you need to come into the hospital or not? That's a big part of our day to day activities is sorting that out. (P204, ED attending)

There is a kind of sickness continuum and where a patient falls on that continuum at any point in time has implications for care and dispositioning. What constitutes "sick"—or sick enough to be admitted, or sick enough to need the services of an intensive care unit or sub-specialist—is at least in some cases relative to the individual patient. Knowing something about the patient's baseline provides information useful for making the sick versus not sick designation, and thus is important for making disposition and treatment decisions.

4.2.3 Care Trajectory

Understanding a patient's illness trajectory often involves also understanding the care that has been directed toward that illness and other comorbidities from which the patient may suffer. Care trajectories are the diagnostic and treatment efforts provided to the patient over time, including both within the ED and other hospital units and in various other healthcare settings. Diagnostic and treatment efforts undertaken in the past and their outcomes provide insight into the patient's present condition, including clues as to what the patient may be experiencing currently and what future developments may be expected.

Because all patients do not respond equally well to a given treatment, knowing about past care trajectories is useful for understanding the patient's current illness and what treatments should be attempted, as one hospitalist explains.

If you know that they were tried on certain medications in the past, you know it didn't work or you know they didn't tolerate it, that's helpful to know if you're thinking about trying them on something similar now. (P107, hospitalist)

Admission handoffs often include exchanges about medications administered in the ED and the reactions these produced. In the following, taken from a handoff conversation, a resident working in the ED explains what pain medications have and have not worked for a patient suffering "intractable right finger pain" following an industrial accident.

We've got absolutely nowhere with morphine, so we did give him a milligram of Dilaudid which helps. He knows that um, that uh, you know, I've kind of talked with him that that's probably not going to continue much as an inpatient, that we'd try to transition to a more appropriate regimen for home, and he's, he's agreeable with that. (H45; P120, General Medicine resident working in the ED; P117, hospitalist)

This excerpt also involves information about how expectations surrounding treatment were communicated to the patient, including what the patient might expect once he transitioned out of the ED to the inpatient setting. The information clinicians have provided to patients and the expectations they have set are part of the past care trajectory. Knowing such details helps the clinician receiving responsibility for the patient to understand what the patient may expect in terms of future care.

When accepting responsibility for a new patient, physicians want to know what diagnostic efforts have been tried and what these efforts have revealed about the illness. Such knowledge of care trajectories provides insight into the present illness condition and trajectory of the patient and is useful for planning additional diagnostic and treatment efforts. As one ED attending explained, learning about previous care trajectories is most important when the illness is a chronic one.

If it's something that's been going on for a long time, and they're here again because whatever reason, then it does become more important [to know about previous

diagnostic results] because you sort of don't want to repeat things that ... have already been done. (P243, ED attending)

There are several reasons why physicians might not want to repeat certain diagnostic efforts that have already been tried, including concerns about costs, invasiveness of procedure, and side effects and other risks to the patient. Information about previous care trajectories and outcomes helps clinicians understand the patient's illness and plan appropriate care while balancing these various concerns. One hospitalist explained, using the example of cardiac catheterization, a procedure performed by a cardiologist to diagnose certain heart-related illnesses.

If [the patient] just had one a month ago, the likelihood that we're going to repeat that is like next to none. It's an invasive study. It's got some associated risks. It's pretty good at telling you what you need to know. It's not a test like, 'Well 50-50,' you know, it's pretty darn good. It's a gold standard, and if somebody comes in for the same complaints that they had a month ago, you know, we're not going to reinvent the wheel there ... because things are very unlikely—with that particular disease process, in a month, it's almost impossible [that something has changed], well, nothing's ever impossible. (P116, hospitalist)

As this hospitalist explains, decisions to perform certain diagnostic efforts in the present are often partly influenced by knowledge of whether or not such efforts have already been tried. However, an important point that comes out subtly in the quote is that the how "old" the prior diagnostic results must be before a new one is indicated depends upon the particular illness. In this particular example, a cardiac catheterization performed within the preceding month is recent enough to provide what may be taken as current information on the patient's heart.

Memorial Hospital, like most hospitals, is designed for acute care; however many patients who present at Memorial suffer from chronic conditions. Typically, the physicians who care for patients while they are hospitalized at Memorial do not have long-term relationships with those patients. In other words, Memorial Hospital physicians typically care for chronically ill patients whom they do not know and have not treated prior to

hospitalization. Thus, they rarely can call upon their own personal experience with the patient to settle their concerns about the acuity of symptoms the patient is experiencing. This can lead to what some consider unnecessary ordering of diagnostic tests. While inpatient physicians accuse the ED of sometimes “overreacting” and treating chronic conditions as acute illnesses that demand immediate, aggressive responses, inpatient physicians themselves sometimes demonstrate similar actions. One hospitalist told me about the case of a patient who had been admitted to the Psychiatric (“Psych”) ward. The patient was complaining of extreme abdominal pain, and the physician on the Psych ward called this hospitalist to “work up” the patient’s abdominal pain, that is to order a variety of diagnostic tests to be certain that the patient was not suffering from a serious abdominal illness. The hospitalist explained that when she looked in the patient’s record she found that the patient had complained of abdominal pain for four years.

...and when I looked back, she’d been followed in our clinics for years, and they’d done extensive workups. She’d even had surgery to have her gallbladder out. Everything had been negative. And so I think being able to see that, knowing that, it’s a lot more helpful to be able to go up and say, “Listen, this has been worked up extensively. Everything’s been negative. It’s much more likely that this is psychiatric. You should treat that and see if it gets better rather than trying to work it all up again.” (P107, hospitalist)

The value of the electronic health record (EHR) in this work of constructing an understanding of past care trajectories is worth mentioning here and a point to which I will return in a later section of this chapter. In this example, the patient had been “worked up extensively” in outpatient clinics. The results of these care efforts were readily available to the hospitalist via the EHR. In one sitting, she could review these past diagnostic efforts and assure herself that further testing was not necessary at this time. In turn, then, she could advise the physician on the Psychiatric ward to focus on treating the patient’s psychiatric illness and to see if that would also improve the abdominal symptoms. In short, the hospitalist used information about past care efforts and data on the outcomes of those

efforts to help her construct an understanding of the patient's present condition and to suggest how care should be moved forward.

4.2.4 Rationale

In many cases it is not sufficient to know that particular diagnostic or treatment efforts have been undertaken. Physicians also want to know the rationale behind those actions. Knowing why a test has been ordered or a particular therapy tried provides insight into what sense other clinicians are making or have made of the patient's illness. This can be particularly important in cases where there remains considerable uncertainty about the patient's diagnosis. Many diagnostic tests can be used to diagnose more than one disease; therefore seeing that a particular test has been ordered is not always sufficient to know for certain what another clinician is thinking about the patient. Rationale often must be explicitly stated.

Rationale is often embedded in the presentation of a patient during handoff. In the following handoff excerpt, a 75 year-old male patient is being admitted for shortness of breath and hypertension. In the excerpt, the ED resident provides rationale for his actions at two points. These are emphasized here to make them easier to spot.

ED Resident: So, he hadn't gotten any of his meds [today]. So, I'll tell you—he has a whole list which is actually somewhat accurate from his recent discharge summary. But the important stuff—so, he's on Felodipine 10mgs daily. He's on Hydralazine 50mgs BID. He's on Labetalol 200mgs BID. He's on Lisinopril 40mgs daily...and then Minoxidil 2.5 BID. So pretty extensive regimen of which he only got the Minoxidil this morning. So all I did is—*looking at the old notes, all they had mostly done is start him back on his orals, and he got better. So, I didn't give him all of them because I didn't want to shank him. So ... I gave him his Hydralazine and his Felodipine doses—*

Gen Med Resident: Okay.

ED Resident: —and his pressure's are now like 160's over 80's.

Gen Med Resident: Okay.

ED Resident: I didn't give him any of the other ones, and *now that his pressure is down, I started—I'm going to give him a liter of fluid now just to hydrate him. He looks pretty dry, but I couldn't justify it with his hypertension and stuff.*

Gen Med Resident: Right.

ED Resident: So, and now that that's better, I'll give him fluids. [emphases added]
(H07; P113, General Medicine Resident; P228, ED resident)

Many medications produce side effects such that in patients with multiple morbidities, the treatment of one symptom may aggravate another. Here the ED resident explains not only what care he provided to the patient, but why. He first explains that he gave the patient only one of his medications “because I didn’t want to shank him,” apparently meaning—based on an interpretation provided to me by another participant—that he was concerned that giving the patient his other medications might cause the patient’s blood pressure to drop dangerously low, potentially risking a stroke. Notice too how he uses information about the patient’s previous care trajectory as part of his rationale: “looking at the old notes, all they had mostly done is start him back on his orals, and he got better.” Beyond providing his rationale, the ED resident may be attempting to justify actions taken. As I discuss in Chapter 5, the admission handoff is often marked by negotiations in which ED physicians feel compelled to sell admissions.

Then, the ED resident notes that the patient “looks pretty dry,” but he explains that he did not give the patient fluids out of concern that these would complicate the hypertension. He further explains that, having gotten the patient’s blood pressure under control, he will now give the patient fluids. So we see that rationale may be provided to explain completed, as well as planned actions, and the communicating of rationale is often entwined with conveying illness and care trajectories.

Discussion of the role of rationale in handoff leads into questions about diagnosing and the extent to which the ED is responsible for diagnosing patients. In the following, a hospitalist explains why he wants to know the rationale for ordering diagnostic tests and connects this to the work of forming a differential diagnosis.

Well, I’d like to have at least—I’d like to see a working diagnosis. I mean, I don’t expect the ER to diagnose everybody, but I want them to have a differential, and a, you know, a reason. Instead of just ordering a bunch of shotgun tests, and they don’t

know *why* they're ordering them. That makes me a lot more nervous, because something could be going on that, you know, because we always—whenever we're hearing symptoms, we're forming differential diagnoses in our head, and based on that, we're either including tests or excluding tests, or including exam findings or excluding them. And if they just do kind of a shotgun approach seldom gets you the information you want, and usually gets you a lot of information that you don't want or is potentially confusing or false positive or negative and leads you down the primrose path. (P104, hospitalist)

The hospitalist characterizes two broad approaches to ordering tests: one that is logically driven by diagnosing and one that is almost haphazard, which he calls "ordering a bunch of shotgun tests." The former he implicitly positions as a preferred approach to medicine, when he says, "whenever we're hearing symptoms, we're forming differential diagnoses in our head, and based on that, we're either including tests or excluding tests." The implication is that there is always a logical thought process behind diagnostic work when it is done appropriately. But he also suggests that such logic may be lacking in some instances. Whether or not it is lacking is not the point. From his perspective there are cases where the actions of the ED staff do not appear to be clearly directed by logical reasoning, but haphazardness. This approach is problematic, he asserts, because it can lead to confusion and distractions.

He went on to explain:

So, while I don't need them to have all of the tests done, or the diagnosis hammered out, if they just say, 'Well, they have some chest pain, and we're admitting them,' that's not good enough. You know? 'Why are they having chest pains? What's the top three things? Why do you think it's not a heart attack? Why shouldn't they be going to Cardiology?' I don't say that in an antagonizing way, but just, uh, I need to make sure what's been evaluated. So that makes it—that's—that—hearing that thought process almost certainly ensures a good handoff. The absence of it ensures a questionable, or bad handoff. (P104, hospitalist)

This excerpt shows that rationale pertains not only to actions taken, but also to sense made. In constructing an understanding of a patient being admitted to his service, the hospitalist, like many of his colleagues, says he wants to know *why* the patient is being admitted. What understanding of the patient has the ED physician constructed that leads him or her to

believe that the patient requires hospitalization and that this particular service is the best one to care for the patient? I take up these matters in greater detail in Chapters 5 and 6.

Note that the hospitalist connects “hearing that thought process” with the quality of the handoff. On one level, knowing the rationale for care decisions helps in the constructing of an understanding because it reveals what sense other clinicians have made of the patient. On another level, however, rationale provides insight into the competence of the clinician. Hearing the thought process of another clinician can be used to make an assessment of that clinician and to determine the extent to which one might trust his or her judgment. Where physicians on the receiving end of a handoff perceive that a rationale is missing or flawed, that perception can be used in constructing an understanding of the patient—namely suggesting that the patient’s case is not well-understood and may require immediate attention. This same hospitalist also told me that when he does not sense a clear rationale behind the actions undertaken in the ED, his concern about the patient is elevated and he usually tries to see that patient right away to assess the patient for himself.

4.2.5 Summary

Understandings of patients are constructed from at least four building blocks. Illness trajectories provide insight into the progression of the illness. Baseline data indicate what the patient’s normal condition is. Care trajectories reveal what diagnostic and treatment efforts have been provided thus far and what results these have produced. Rationale provides insight into the thought processes that motivate clinician and patient actions. These building blocks are closely interrelated. For example, care trajectories provide insight into illness trajectories. That is, knowing what care efforts have been tried and what outcomes they have produced gives some understanding of how the illness is or is not progressing. Similarly, rationale often makes connections between illness trajectory and care trajectory by providing explanation of how the latter is a response to the former.

Likewise, baseline data is often useful for interpreting current illness indicators, putting them into perspective relative to what is normal for the patient. While the particular pieces of information that are needed will vary depending on the illness(es) from which this patient is suffering, these four building blocks appear to be fairly consistently useful across a wide variety of illnesses.

4.3 Electronic Health Records and Chart Biopsies

There is a variety of ways physicians gather information when constructing an understanding of a patient. They talk to patients and family members and physically examine patients. Physicians order and interpret the results of various diagnostic tests, including radiographic imaging and laboratory tests (i.e., “labs”). They receive formal consultations from specialists and informal advice from available colleagues. And, of course, they engage in handoff conversations. They also consult the patient’s chart, the official record of care provided to the patient. In this section I explore how inpatient physicians use the electronic health record (EHR) to aid in the construction of an understanding prior to taking the admission handoff.

At Memorial Hospital, once an ED physician has decided to admit a particular patient, the ED physician must send an alphanumeric page to the inpatient physician who is accepting admissions for the service to which the patient is to be admitted. The inpatient physician then calls the ED physician and takes the handoff over the telephone. What my data reveal is that as a result of the advent of the EHR, there is now a new step possible in this process, often taken between the time the ED physician sends the page and the time that the inpatient physician calls back to take the handoff. This step is the pre-handoff chart biopsy, and it is performed by the inpatient physician.

Chart biopsy is an informal term used by some clinicians (at Memorial Hospital and other institutions) to label the activity of selectively examining portions of a patient’s health

record to gather specific data or information about that patient or to get a broader sense of the patient and the care that patient has received. The chart biopsy is an activity in which a clinician may engage multiple times while caring for a patient; however, of concern here are those chart biopsies performed by inpatient physicians prior to assuming responsibility for the care of newly admitted patients. Throughout the chapter, my concern is with pre-handoff chart biopsies, whether or not the term *pre-handoff* is used. To my knowledge, chart biopsy has not been previously studied or documented.

The pre-handoff chart biopsy is conducted prior to actually seeing the patient or “taking the story” via handoff from another health care provider who has been responsible for the patient. Just as the medical procedure known as biopsy involves the targeted selection, retrieval and examination of bodily tissue to aid the process of diagnosis, so a chart biopsy involves the targeted selection of patient-related information from the health record to aid clinicians in the process of constructing an understanding of a patient.

The pre-handoff chart biopsy is a relatively brief and variable information seeking activity that fits into the larger admissions process and can play a part in physicians’ efforts to construct an understanding of the patient. The understandings that physicians develop from doing a chart biopsy can shape their impressions of patients and of the care provided by other clinicians and may have consequences for the handoff interaction and subsequent care of the patient.

An EHR makes a pre-handoff chart biopsy possible. Without an EHR the documents containing patient information would likely be scattered in various outpatient clinics and the ED, inaccessible to the General Medicine physician prior to taking the handoff. Drawing from their experiences at other hospitals where no EHR was in place, several participants spoke favorably about Memorial Hospital’s EHR, in particular, its affordance of pre-handoff chart biopsies. In the words of one hospitalist, handoffs at the institution where he formerly

practiced would “bumble down the road” because the General Medicine physician would enter the handoff conversation without the benefit of an understanding gleaned from a chart biopsy.

Pre-handoff chart biopsies typically happen amid numerous other unrelated tasks in the busy context of a hospital where various concerns compete for the physician’s time and attention. Extensive reading of a patient’s record was almost never observed. Rather than gathering a complete understanding of the patient, the function of a chart biopsy is to provide an overview of the patient and, in some instances, to answer specific questions. In the words of one resident, the pre-handoff chart biopsy “just gives you kind of like an overall gist of the patient.” This gist in turn helps the physician “get a very rough overview of what I’m expecting here,” as another resident put it. In this respect the pre-handoff chart biopsy provides additional information beyond what may be contained in the alphanumeric admission page to enable the receiving physician to begin forming an impression of the patient and disposition plan.

The remainder of this section is organized as follows. First, I discuss the general role of the Memorial Hospital EHR in chart biopsy and some of the ways it affords constructing an understanding. Next I examine two broad groups of questions that drive much of the information seeking that happens during a chart biopsy. This is followed by a discussion that demonstrates how information that is encountered—although not specifically sought—during chart biopsy further contributes to the ongoing construction of understanding. I then describe some of the variations in the practice of chart biopsy which I observed and suggest several factors that may contribute to such variations. I conclude with a brief discussion of some of the consequences which physicians perceive to result from chart biopsies.

4.3.1 The EHR

Memorial Hospital and its larger associated health care system use three web-enabled electronic health records. Two are relevant to the present discussion. “MedRec”¹⁶ is the main EHR, containing clinician notes, lab and test results, radiographic images, and other basic patient information. “EDCentral” contains records pertaining to a patient’s ED stay, such as nurse triage notes, admission requests, and a “flowsheet” of time-stamped activities undertaken in the ED. Both MedRec and EDCentral are routinely accessed during chart biopsies; however these two systems are essentially separate and have limited interconnectivity. The hospital also has a computerized provider order entry (CPOE) system through which physicians issue orders for the care of patients; however, this system was never used during any observed chart biopsy.

Physicians may examine any number of different parts of the patient’s record during a chart biopsy. Labs results, vital signs and radiographic images provide what some refer to as “objective data” about the patient. Provider notes contain narrative accounts and interpretations of the patient’s illness, the diagnostic and therapeutic efforts undertaken, and the results of those efforts. As we shall see, what physicians look at depends in part on what questions or concerns they have about the patient and the disposition decision based on the text of the admission page they received.

Certain portions of the record provide salient cues for making inferences about the patient and disposition plan. For example, in the MedRec system, the provider notes table of contents page only lists the date, provider name, department, and service for each note. The contents of the note, including details about the visit, diagnostics and treatment efforts, are available on a separate page via hyperlink. Scanning the table of contents, however, and simply seeing a note listed from a particular service can contribute to expectations about a

¹⁶ Aliases have been used for the clinical information systems.

patient. For example, seeing a note from a facility he recognized, one hospitalist made this predication about a patient, “She’s gonna be sick: she’s in the nursing home.”

One General Medicine resident explained that physicians can sometimes get an overall gist of the patient without reading any details in the record.

Some patients have ten pages of notes, and some patients have a totally blank screen. So for the patients who have ten pages of notes, it’s either because they’ve been really sick and been in and out of the hospital for a long time, or because they’ve perceived themselves to be very sick and so you know some—depending on—even without opening any notes you can go and see who wrote all the notes.... And it gives you an impression of the patient, even without reading all the notes. (P111, General Medicine resident)

Physicians can develop expectations of patients simply by seeing how many entries have been made in the patient’s record or by seeing what kind of physician(s) have cared for the patient in the past. However, as the resident indicates, the exact meaning of such cues is not unambiguous. As she explains, a large number of entries in a patient’s record may indicate that the patient is “really sick” or it may indicate that the patient “*perceive[s]* themselves to be very sick [emphasis added].” The entertaining of such ambiguity is an important feature of constructing an understanding of a patient and one that will reappear in the discussions below.

The resident went on to talk about inferences that can be made from a quick overview of the patient’s electronic health record.

A lot of people have one primary care visit after another, after another, after another. And you open one of those notes, and it’s, like, “patient presents with recurrent headaches.” It’s like those patients who are at their doctor’s all the time for the same thing.... I’m guessing, if they have seen their doctor a hundred times for the same problem that somewhere along the way a thorough work up has been done and whatever they’re coming in for is some variation of what they’ve always been dealing with and not something brand new. It just gives you kind of like an overall gist of the patient of how likely—I guess it just helps puts them on the continuum of sick versus not sick, which is kind of what you first like develop or your reaction. (P111, General Medicine resident)

The resident’s comments speak to constructing an understanding by getting a sense of the illness trajectory. The distinction being made is between a long-standing chronic illness and

a newer illness that may or may not be chronic. At the pre-handoff stage of understanding construction, the EHR can play a useful role in recognizing that a particular patient's illness is a long-standing, chronic one. In those instances, the physician may expect to find more information, including findings from extensive work-up of the illness performed in the past. Such information can be very useful in getting a sense of the illness trajectory and knowing what further work up is required and what future developments are to be expected. Of course, even when the record contains no indication that a given illness is long-standing, it may nevertheless be long-standing. EHRs are not complete records of past medical histories. Some patients who come to Memorial Hospital have never been cared for within the health care system affiliated with the Hospital. Thus, they have no existing records in the EHR.

Note the role of inference and abduction in the preceding quote. The resident says "I'm guessing," thereby acknowledging she is forming a hypothesis about the care trajectory. She also speaks of getting an "overall gist" of "how likely" it is that the patient is "sick." These comments remind us of the tentative and potentially changeable nature of understandings as they are being constructed.

As the previous quotes illustrate, chart biopsy can be useful for getting a sense of a patient's illness trajectory. Chart biopsy can also be an opportunity to gather any of the other building blocks as well. For instance, inpatient physicians often use the EDCentral system to learn about care trajectories in the ED. In one example, while doing a chart biopsy on a 67-year-old female being admitted for acute renal failure, one hospitalist scanned the flowsheet, the time-stamped list of activities undertaken while the patient had been in the ED. The following excerpt from my field notes shows how this hospitalist used the timestamps to build his understanding of the ED care trajectory.

He looks at the ED flowsheet for [patient #3] and laughs. He points out that at 13:04 the "resident sees her" and 13:46 he is "admitting her. He's done nothing for her.

Probably hasn't even gotten labs yet." He laughs. He notes aloud that he did not see an EKG ordered. He uses the browser's search function to search for the term "EKG" on the page, but the term is not found. (P101, hospitalist, Field notes)¹⁷

Knowing something about how long it takes to accomplish various diagnostic tests in the ED, this hospitalist is able to form an impression of the ED's care of this patient merely by seeing that the patient has been in the ED for less than 45 minutes. His initial inclination is to think the ED physician may be acting prematurely in admitting the patient so quickly. He assumes that the ED resident "probably hasn't even gotten labs yet." A few seconds later, considering the patient's age and what he has already learned from glancing at some provider notes from previous hospitalizations, he revises this impression, mumbling that the admission is "probably reasonable." The important point is that pre-handoff chart biopsies play a part in shaping the inpatient physician's impression of the care provided by the ED staff and the competence of that staff. Such impressions may be carried into the subsequent handoff conversations and can influence the degree to which an inpatient physician may trust the information provided in handoff. Where concerns about the competence or appropriate actions of ED staff are raised during pre-handoff chart biopsy, inpatient physicians may find their own level of concern about the patient and disposition plan heightened. Impressions of competence and variable levels of trust play a part in shaping the negotiations of handoff, discussed in Chapter 5.

Note too that the hospitalist uses his web browser's search function to see if an EKG has been ordered. If the ED has ordered a test or lab, it will be listed in the flowsheet, although the actual results of such tests would be located in the MedRec system. The hospitalist looks for the EKG here because he is trying to get a sense of the completeness of the ED care trajectory, particularly in light of his initial concern that the ED may be acting a bit prematurely in admitting the patient. That the hospitalist must resort to using his

¹⁷ I provide an analysis of other aspects of this chart biopsy later in Section 4.4 Constructing as Action.

browser's search function to look for this information, suggests a potential usability problem with the system. My interest here is not with the design features and usability of this particular EHR. Rather, my point is that the design of the EHR will afford some kinds of actions better than others and this may have consequences for the resulting constructed understanding.

Chart biopsies may also be used to get a sense of a patient's baseline, such as by reading notes entered by other providers during previous clinic visits. Similarly, knowing what medications the patient takes on a regular basis and what comorbidities he or she suffers from provides some insight into the patient's baseline. MedRec includes a Problem Summary List (PSL) that lists the patient's existing diagnoses and medications. Looking at this list during a chart biopsy can provide a sense of how "sick" the patient is. This is yet another indication of the role of inference in the process of constructing an understanding. A long list of many different medications is taken as a cue and used to infer that the patient is "sick at baseline," meaning the patient's "normal" health is much poorer than would be expected of the general population.

Rationale is often explicitly contained in the EHR in the narrative notes written by clinicians. However, as one ED attending explained to me, the ED physician's rationale is typically not available during pre-handoff chart biopsy.

The problem is—is our charts are dictated. So, they're not usually dictated by the time you have the [handoff] conversation. [...] There's no thought process. You know, you can't see why—why did we do this? Or what did we consider, or rule out and whatever. (P201, ED attending)

While the flowsheet provides a fairly comprehensive listing of care provided in the ED, it contains little if any information about the thought processes and concerns that motivated ED clinicians to undertake those actions. Consequently, while chart biopsy may allow inpatient physicians to construct an understanding of some or much of the work undertaken in the ED, it may not provide much insight into the rationale that motivated that

work. In other words, chart biopsy may provide only a partial understanding of the patient and even contribute to ambiguities going into the handoff.

The lack of access to the ED physician's rationale during pre-handoff chart biopsy may be seen as both problematic and beneficial. It is problematic, as this ED attending was suggesting, because without access to that information, inpatient physicians may enter the handoff thinking the ED staff has not considered certain diagnoses or possible complications when in fact the ED staff did. As a result, the handoff may involve what some ED staff perceive as unnecessary, confrontational questioning contributing to the need for negotiations, which I discuss in the next chapter. On the other hand, lacking access to the ED physician's rationale during chart biopsy may reduce the likelihood that inpatient staff become trapped into the ED physician's thinking about the patient and treatment. Thus, it may increase resilience by helping the inpatient physician to avoid biases and develop their own reasoning about the case.

EHRs greatly improve access to patient information and thereby support efforts to construct understandings of patients during chart biopsy; however, for all their benefits, EHRs also pose problems for the work of constructing understandings. Three sources of problems are: the functionality of the system, the incompleteness of accounts, and the inaccuracy of information.

The functionality and usability of the EHR can effect a clinician's ability to construct an understanding. One hospitalist I observed complained because MedRec offered him no simple way to view a patient's current labs side-by-side with those obtained during prior visits. "I have to switch back and forth between screens," he explained. As the previous section demonstrated, getting a sense of a patient's illness trajectory often involves making connections between data obtained at different points in time and looking for trends. The

degree to which an EHR's design makes this action simple or difficult will have some bearing on the understanding that a clinician constructs.

Furthermore, chart biopsies can contribute to misconceptions and inaccurate understandings of patients and care trajectories because EHRs do not provide complete accounts. I observed a General Medicine resident as she reviewed the records of a 21 year-old female being admitted from the ED for pneumonia, hypoxia, and a suspected case of the H1N1 flu. Finding no record of a chest x-ray or evidence that such a test had been ordered yet in the ED, the resident expressed to me that while she suspected the patient did need to be admitted, the ED was probably acting prematurely. Specifically, she felt that the ED should have ordered an x-ray first, given that the patient was being admitted for pneumonia. However, during the handoff conversation, the General Medicine resident learned that the patient had been seen earlier that day in an outpatient clinic where an x-ray had been ordered. The clinic had referred the patient to the ED and sent physical copies of the x-ray films with her. So, in fact, the ED had examined current x-rays of the patient's lungs prior to making the disposition decision. But because the x-rays had been obtained in a clinic whose records system that was not interoperable with the hospital's EHR, that information was not available to the General Medicine resident during chart biopsy. Thus, EHRs do not provide complete accounts of patients and their illness and care trajectories; rather EHRs provide evolving accounts. Depending in part on *when* the EHR is accessed, a different understanding of the patient may be constructed.

Finally, EHRs can make constructing understandings difficult as a result of inaccuracies in the information contained in the record. One common example has to do with medication lists. Obtaining an accurate listing of all medications the patient is currently taking is important to ensure the patient is properly cared for while hospitalized. When patients are being treated with many different medications, it is not uncommon for

one or two to be inadvertently omitted from any listing. During chart biopsies, inpatient physicians often looked at the medication lists contained in the Problem Summary List or in the last discharge summary—the note from when the patient was last discharged from the hospital—when seeking to understand patients and their illnesses. But some physicians treat such lists with suspicion, pointing to instances in the past when they have found such lists to be inaccurate. Some physicians regularly printed out these lists and took them with them when they went to see the patient. These physicians used the information in these lists to prompt patients to provide more complete, accurate lists. It is likely that EHRs will always contain some inaccurate information¹⁸, but the pairing of EHR usage with certain practices may preserve the usefulness of the EHR while ensuring greater resilience.

Before moving on to explore the information seeking and encountering of chart biopsy, there is one point I wish to make more explicitly. I have deliberately used the phrase “get a sense” when talking about how physicians use various aspects of the EHR in constructing their understandings. As the above discussions have demonstrated, looking over a patient’s record does not typically provide a definitive understanding of the patient. Rather, chart biopsies are used to develop initial, tentative understandings built on provisional hypotheses which will be further explored and tested during the handoff conversation, in subsequent encounters with the patient, and through additional diagnostic and therapeutic work.

The ongoing work of construction is crucial, as understandings of patients in changeable illness trajectories typically require updating (Christianson, 2009). There is a considerable literature on the many cognitive biases to which physicians are prone (Croskerry, 2002, 2003; Groopman, 2007), biases that are generally common in non-

¹⁸ I should note that obtaining accurate medication information is a challenge that is not unique to EHRs. Physicians tell me that they sometimes find it difficult to get this information from their colleagues at handoff or even directly from the patient.

medical settings as well (Tversky & Kahneman, 1974, 1981). Chart biopsy has the potential to serve as a safeguard against biases, but may also contribute to them. One hospitalist suggested that a motivating factor for conducting a chart biopsy is to protect against inherited biases from the ED that might be passed on during handoff. But, of course, physicians may also conduct their chart biopsies in such a manner that anchors thinking about patients in certain ways and creates cognitive biases. The important point is that chart biopsy has the potential both to improve clinical reasoning and also to complicate and hinder it.

4.3.2 Information Seeking during Chart Biopsy

Pre-handoff chart biopsies are not casual browsing sessions. The demands of other work tasks and the pressures of time constraints make casual browsing impractical. Rather, chart biopsies are frequently driven by questions that emerge from generic overarching concerns about disposition plans and specific concerns about the patient arising from the description provided in the admission page.

4.3.2.1 Generic Overarching Concerns.

Generic overarching concerns about disposition plans address two issues: 1) the appropriateness of admitting as opposed to discharging the patient, and 2) the appropriateness of placing the patient on the particular service. The ED physician develops the disposition plan—that is, decides whether or not to admit the patient and if so, which service to admit the patient to. Nevertheless, the disposition plan devised by the ED physician is not automatically accepted as appropriate by General Medicine physicians. Instead, General Medicine physicians frequently use the chart biopsy as a means to evaluate the appropriateness of the plan.

First, physicians sometimes differ in their opinions regarding whether or not a particular patient's case warrants an admission. Established guidelines offer answers for certain conditions, but there are many symptoms and complaints that are as yet beyond the reach of clear guidelines. This leaves the door open for some differences of opinion. Some ED and General Medicine physicians in this study acknowledged that ED staff are not always aware of what treatments and diagnostics are readily available in outpatient settings. As the following quote demonstrates, General Medicine physicians may conduct a chart biopsy to assess the decision to admit and then use the information they gather to argue for an alternative disposition plan during the subsequent handoff.

When the ER calls up that they want to admit somebody, we'll review the record [...] and I will look at their outpatient provider notes to see if it's a chronic issue or to see if it could be otherwise managed. And you call back, and you talk to the ER physician, and sometimes they just haven't thought of another option. And you can say, "Well, you could do this or this and that would—and it doesn't look like they necessarily meet inpatient criteria, but blah, blah, blah," and you know they'll reconsider it. (P106, hospitalist)

Handoffs can be moments of resilience when the party receiving responsibility brings a fresh perspective to the patient's case (Behara, et al., 2005). As the quote above demonstrates, a pre-handoff chart biopsy can play an important role in preparing the receiving party to effectively bring this fresh perspective.

Second, even when there is little question that the patient needs to be admitted to the hospital, General Medicine physicians may question the appropriateness of the placement decision. This concern involves two parts, as one hospitalist explained: "The first is, should it come to a medicine service, and if yes, should it come to our service specifically." The first part arises from the subdivision of the hospital into medical services and surgical services. Disagreements can arise over whether a patient belongs on a medical or surgical service. The second part arises from the subdivisions within Internal Medicine, which, in addition to General Medicine, includes a number of subspecialty services with

admitting privileges. Among these are Cardiovascular Medicine (Cardiology), Pulmonary, Hematology and Oncology, and Gastroenterology, as well as critical care services. Given the complexity and co-morbidities of many patients admitted at Memorial Hospital, arguments can often be made that a given patient belongs on more than one Internal Medicine service. Knowing that these disagreements arise during handoffs, General Medicine physicians often use the chart biopsy to gather information to evaluate the placement decision before taking the handoff. I explore the disagreements that arise over placement and the negotiations that settle these disagreements in Chapters 5 and 6.

While the appropriateness of some placement decisions is debatable given the challenge of matching complex patients to “the right” service within a highly specialized and subdivided organizational structure, other placement decisions are clearly spelled out in hospital policy. Still, the patient details that indicate a particular policy applies to a given placement are sometimes overlooked in the ED. Thus, the generic overarching concerns that guide many chart biopsies include looking for evidence whether or not particular placement policies apply to the present case. For example, hospital policy also states that patients who have a Family Practice physician should be admitted to that service, but General Medicine physicians complained that ED staff frequently miss this designation. Consequently, checking whether or not a patient belongs to Family Medicine was one of the most common tasks observed during pre-handoff chart biopsies. In some cases, it was the only detail physicians checked during the chart biopsy. One resident explained why this is important:

...because otherwise you admit them and you give [the patient] to [Family Practice] the next day, and it just doesn't make sense. It should be in the same hand [sic] from the first minute. It's mainly to prevent extra work and to ensure patient continuity, patient safety. That's, for me, the main reason what I'm looking for rather than actual diagnosis or anything. (P109, General Medicine resident)

The resident, like others who participated in this study, describes the act of checking such details before taking the handoff in terms of efficiency, quality of care, and safety. In this

sense, the pre-handoff chart biopsy is positioned as a means of influencing organizational workflows and as a resource for enabling organizational resilience.

4.3.2.2 Patient-specific Concerns.

Frequently the description of the patient provided in the admission page gives rise to certain specific questions which in turn direct the information seeking during the chart biopsy. A field note example from an observation of a hospitalist provides an illustration.

He reads part of the page aloud: “‘history of lung cancer. Got chemo and radiation. Here for further treatment. Worsening dyspnea.’ So, why is she coming to us?” He reviews the patient’s record and mumbles, “This sounds—not good.” (P104, hospitalist)

The hospitalist in this example is perplexed by the decision to admit this patient to General Medicine, since patients undergoing active chemotherapy are normally admitted to the Oncology service. The information provided in the text of the page gives rise to a question in his mind: “So, why is she coming to us?” The important information he is missing is rationale. A sensemaking process is triggered, directing the physician’s information seeking in the patient’s record. He looks for some explanation as to why the patient would be admitted to General Medicine. Dyspnea, or shortness of breath, is a symptom of many different illnesses, some of which are more severe than a General Medicine service might be equipped to handle. Thus, the mention of this symptom does not provide sufficient information for the hospitalist to assess the appropriateness of placing the patient on his service.

Rather than casually browsing the record, physicians look at particular parts of the record for specific pieces of information, based on how the patient’s complaint is framed in the admission page. A different hospitalist explained:

If it’s a patient with heart failure, I’ll look for their last echocardiogram to see what their heart function is like, or someone coming in with chest pain, I’ll see if they’ve ever had a stress test or something like that. (P105, hospitalist)

Chest pain, to take one of the examples from this quote, is a symptom of multiple illnesses, representing a considerable range of severity, which in turn might suggest that different levels of care or types of sub-specialty expertise are needed. The physician looks into the patient's record for particular tests and examines the results to evaluate the severity, form a differential diagnosis, and assess the disposition plan. As a result, he enters the handoff knowing concrete details about the patient's condition and care rather than just knowing that the patient has "chest pain."

4.3.3 Information Encountering

Concerns not only direct the information seeking during chart biopsy, but they also emerge during the process. While reviewing the patient's record, General Medicine physicians sometimes developed questions and concerns based on the information they encountered in the record. That is, the process of making sense is not only an effort to span known gaps in one's understanding, but may also uncover additional gaps as well. The following field note excerpt demonstrates how this happens.

P107 looks up the patient's record in the system. "Nothing scary yet," she says while scanning the previous outpatient and inpatient visit records. P107 realizes that the patient just left Ortho [orthopedic surgery] two days before. "Why is this one coming in and why to us?" She reads on, then remarks out loud, "Why's she coming in? And Ortho won't take their own patient?" She turns to another doctor in the room and says, "She's coming in for pain, and she had surgery three days ago. Oh, how irritating!" (P107, hospitalist)

This chart biopsy began as an effort to gain a quick overview of the patient, but concerns about the disposition plan emerged and the physician's affective state changed once she encountered information about a recent hospitalization for surgery. The normal practice Memorial is that patients being readmitted within seven days of a discharge should be re-admitted to the same service that previously cared for them unless the new admission is completely unrelated. As a result of the chart biopsy, this hospitalist's understanding of the patient went from "nothing scary" to the conclusion that the patient belonged on a surgical

service, and she entered the handoff irritated with the disposition plan. Notice, too, how her understanding of the patient is being constructed, evolving as she encounters details in the record. She comes to define the patient as belonging to the orthopedic surgical service (“Ortho won’t take *their own* patient?”). In Chapter 6 I discuss how the borders between hospital units are enacted during handoff interactions. The emerging understandings that inpatient physicians construct during chart biopsy inform their thinking about divisions of labor going into handoff.

The questions that emerge during chart biopsy are not only those which assess the disposition plan, but also those which address the ongoing care of the patient. One resident offered an example.

So if you can look the patient up before you have that conversation you already know five questions you’re going to ask them [the ED physician] because you see, “Oh, they had a renal transplant,” and “How’s that doing? Did you guys send these tests?” Because there’s certain tests, you know, they might come in with a complaint of a headache, you know, or something and have a new brain tumor, but if they have a renal transplant you always need to check and see how that’s doing and check the levels of their anti-rejection drugs they’re taking et cetera. So, you know, as a side point: “Did you send those tests off? Did you think to see how their status is?” I find that that is more helpful if I can look the patient up before I call them. (P110, General Medicine resident)

Information uncovered during the chart biopsy can trigger the receiving physician to ask pointed questions during the handoff, potentially ensuring that important aspects of the patient’s care are not overlooked during the transition of responsibility and control.

4.3.4 Variations in the Practice of Chart Biopsy

The practice of pre-handoff chart biopsy can vary, at times considerably, from one physician to the next and even from one instantiation to the next by the same physician. Although no attempt was made to time all chart biopsies, some were observed to last less than thirty seconds, while others lasted more than ten minutes. Some chart biopsies involved accessing both EDCentral and MedRec. Others involved accessing only one system.

Two physicians in particular, each observed on multiple occasions, were regularly methodical in their chart biopsies and appeared to spend more time and explore more aspects of the record than did many of their peers. Other physicians displayed more irregularity in performing chart biopsies. These sometimes scanned records quickly and briefly, while other times they read portions more carefully. At times they sought the answer to a single question, while other times they looked for information relevant to multiple concerns. Many of the physicians who participated were observed, at some point during the study, to take a handoff without performing any semblance of a chart biopsy beforehand.

Variations in practice of chart biopsy may be partially understood as responses to variations in patients and the way patients are presented in the text of admission pages. For instance, some patients are more complex, with various co-morbidities and complicated past medical histories that give rise to multiple concerns about appropriate disposition and treatment. Other patients' cases are more straightforward and clear protocols exist to guide disposition and care. The concerns that arise regarding the former group of patients can stimulate a desire to explore more of the record than is often the case with the latter group.

One hospitalist suggested that some variations in chart biopsy practices may stem from the clinicians own past experiences and be related to cognitive biases, which have been shown to derail judgment and complicate diagnosing (Croskerry, 2002, 2003; Groopman, 2007; Tversky & Kahneman, 1974). Specifically, this hospitalist suggested that some of the information seeking that happens during chart biopsy may be an effort to minimize cognitive biases and to avoid traps one has fallen into in the past. An awareness that "I've been burned by this before" may spur physicians to look in the record closely to better inform themselves to avoid making the same mistake twice. Since different clinicians

will have had different past experiences, they would be attuned to different potential biases and traps.

Practice variations may also be understood as responses to situational demands, specifically time constraints and other concerns competing for the physician's attention, as one hospitalist explains:

Well by now I do have a system, unless, let's say, I'm swamped and I'm in seeing a patient and ER keeps paging me, paging me, paging me. I step out and just call without even looking up. I take the story, finish what I'm doing, and then go back and look up [the patient's record], and if there are any issues then I call them again. (P112, hospitalist)

Physicians may spend less time and conduct less thorough chart biopsies or not conduct a pre-handoff chart biopsy at all, as the quote shows, because of situational constraints. At other times no pre-handoff chart biopsy is performed because the ED physician does not include sufficient details, namely the patient's EHR ID number, in the text of the admission page so that the General Medicine physician can locate the correct record. In other cases, the patient is new to the system, with no previous records on file and only a minimal record of the ED's activities in EDCentral is available, limiting the General Medicine physician's ability to construct a detailed understanding of the patient. Recognizing that the practice of performing a pre-handoff chart biopsy is a variable one leads to the realization that General Medicine physicians enter different admission handoffs with different degrees of understanding of the patient. As a result, the interaction during handoff may be expected to vary.

4.3.5 Consequences of Chart Biopsies

Physicians in both the ED and General Medicine services suggested that chart biopsies impact the content and nature of handoff interactions.

I think from my end [when I don't look up the patient's record before taking the handoff], it's just a lot more at the mercy of the emergency room residents, what they're telling me, what the story is, and I just say, "Okay," and I don't usually have—

I may have a few questions that came up from what they're telling me, but, you know, I don't really have any specific questions. Whereas if I would have looked them up before sometimes I will [have specific questions]. (P111, General Medicine resident)

This resident's comments suggest that her own ability both to construct an understanding of the patient and to interact during the handoff are affected by the information she gathers (or does not gather) prior to taking the handoff. Without a pre-handoff chart biopsy, she is "at the mercy of the emergency room resident." In other words, a pre-handoff chart biopsy may empower the receiving physician to take a more active role in the handoff. General Medicine physicians perceived that as a result of the pre-handoff chart biopsy they asked better questions during handoff and used the time more efficiently. Reducing unnecessary admissions and inappropriate placements were also cited as benefits of pre-handoff chart biopsy.

The chart biopsy then can be a kind of preparation for the handoff.

I kind of feel like it's preparing for the conversation almost. You know? You're preparing for the information transfer by reviewing the information beforehand and then being able to actually hear what they're saying and—you know, you could be so busy talking, thinking about what it is that you want to ask, that you don't hear. But then other times you do hear and you're able to re-direct or ask a question in a different way and get some more information, whereas I don't think you can—like, I don't think you could have—I would argue that that's a better quality interaction than not looking at the chart first. I have my N of 1, but that's what I feel. It helps me, um, it helps me process. And I also think that there needs to be—there's a lot of distracters when you start engaging the patient, the family, and the other physicians and their perceptions. (P106, hospitalist)

As this hospitalist explains, doing a chart biopsy before taking a handoff initiates the process of becoming familiar with the patient's case. The physician on the receiving end, thus, enters the handoff with at least a beginning constructed understanding, and this hospitalist suggests that makes it easier to listen and easier to engage actively in the conversation. The last sentence in the quote suggests that chart biopsy may also serve as a protection against distracters and biased interpretations others may have of the case. No

wonder some physicians call chart biopsy “doing my homework” or “doing my due diligence.”

4.3.6 Summary

Electronic health records play a part in the work of physicians to construct understandings of their patients. Through information seeking and information encountering in the EHR, physicians gather the building blocks needed to construct provisional understandings of patients. Furthermore, EHRs appear to have the ability to alter the dynamics and nature of between-unit handoffs. At Memorial Hospital, General Medicine physicians were observed to conduct chart biopsies—brief perusals in the patient’s EHR—prior to taking admission handoffs. Consequently, physicians on the receiving end of handoff felt better able to ask questions and make more effective use of the handoff.

4.4 Constructing as Action

At the start of this chapter I noted the need to focus on action if we are to understand constructionist processes. The realities, knowledge, or meanings that people construct emerge from the actions they take. Throughout the preceding sections, I have provided numerous examples of physicians taking actions that result in shaping understandings. We have seen getting a sense, conducting chart biopsies, foregoing doing a chart biopsy, seeking information, and encountering information. They talk. They read. They ask questions. These various actions are important to producing the building blocks of an understanding, but what remains to be described are the actions involved in *constructing*. In this section, I turn to a more explicit examination of the actions involved constructing understandings, drawing upon the notion of abduction (Houser, 1998) and the work of noticing, extracting, and embellishing cues (Weick, 1995).

I will explore some of the actions involved in constructing an understanding, by walking through an analysis of one observation from my field notes. Above, in Section 4.3.1, I provided an account of a hospitalist who used the timestamps in the EDCentral flowsheet to make inferences about the ED care trajectory of a 67-year-old female patient suffering from renal failure. Here, I provide more details from that observation. In this excerpt, the hospitalist (P101) begins the chart biopsy having just received the admission page which stated the patient was to be admitted for “n/v,¹⁹ weakness, renal failure.” The full excerpt I am using is printed here, but various portions of it are reprinted throughout the section as I examine them more closely. Although I never asked him to do so, this particular hospitalist regularly “thought aloud” as he worked, allowing me some natural access to his thinking process.

P101 looks at the patient’s labs noting that her potassium is a little high. He guesses that she is “probably a little dehydrated.” [...] As he continues to look over the patient’s record he discovers that he himself saw the patient in 2006. He looks at his note from that visit a bit more closely. He thinks he might remember her. “If she’s who I think she is, she’s a mess.” He then looks at a more recent note from her last hospital discharge, reading a point or two aloud, “nausea and vomiting” and “poor historian.” [...] “What we need to figure out is why she is in renal failure. Her last visit, what did her labs look like?” He asks aloud of himself. He then looks over the discharge note from the rehab facility written in late August, about 2 and ½ months ago” (P101, hospitalist, Field notes)

The first cue that is noticed and extracted and which triggers the hospitalist’s initial information seeking is the term “renal failure” in the text of the admission page. Kidney function is measured by laboratory test; hence, the mention of “renal failure” in the text of the page played a part in motivating the hospitalist to begin by looking at the patient’s lab results. Based on his knowledge of medicine and of diagnostics in particular, he knows that in order to get a sense of the patient’s renal failure, he will need to look at certain labs. Already we can see the connection between extracted cues and the action that the

¹⁹ n/v is an abbreviation for nausea and vomiting

information seeker takes. We see that chart biopsy is not a mundane, mindless, highly routinized activity—it does not proceed by “dead habit” (Cohen, 2007). Rather, it is a situated action adapted to an unfolding process of making sense. We also see that while cues extracted from the environment are central to the triggering of particular actions, past experience and knowledge are called upon in making *use* of those cues. If it seems obvious that the hospitalist would look at the patient’s lab results having heard that she is in renal failure, it is only because we know that kidney function is measured by laboratory test.

The hospitalist’s knowledge is also important in noticing what he takes to be the next cue: he sees that her potassium is 7.4 and notes aloud to me that it is a little high. The normal range is 3.7 to 5.2. Having extracted this cue, he must interpret it. In the language of sensemaking, he must come up with a plausible explanation. To do so, he abduces that she is ‘probably a little dehydrated.’” High levels of potassium, or hyperkalemia, are often directly attributable to dehydration, which in turn may be caused by decreased kidney function, among other possible causes. The important point is that abduction is employed to work backwards from what is observed (i.e., the patient has a high potassium level) to what *may* have caused that which has been observed (i.e., dehydration). He cannot definitively solve this puzzle. He can only form a hypothesis which he can use in his subsequent work.

The hospitalist now turns his attention to another part of the EHR—the part where clinical notes are displayed. He is quickly scanning the list of health care providers who have cared for the patient when he notices his own name.

As he continues to look over the patient’s record he discovers that he himself saw the patient in 2006. He looks at his note from that visit a bit more closely. He thinks he might remember her. “If she’s who I think she is, she’s a mess.” (P101, hospitalist, Field notes)

Perhaps understandably, his own name grabs his attention. Thousands of patients pass through the service each year, and they are cared for by roughly 30 hospitalists.

Consequently, in the overwhelming majority of cases, physicians at Memorial Hospital care

for patients they have never seen before. He opens the note and begins to read it, not simply out of curiosity, but as an attempt to remember and, thereby, to construct his understanding. Plausibly, his own note might help him tap in more quickly to what he already knows about the patient. Later he told me more about the patient, pieced together from what he remembered and what he had written in the note three years prior. The patient has deep wounds in her legs which are the site of recurring infections. The hospitalist calls her a “classic case” of why healthcare is so expensive, explaining that she refuses surgery: “the very thing that will help her.” As he looks over the long list of entries in her record, indicating she has been in and out of the hospital many times over the last several years, he adds that “she’s been advised over and over again to have surgery and have her legs amputated. She always refuses.” Subsequently, her legs continue to become severely infected, and because she is unable to take care of them herself, she ends up back in the hospital “over and over.” Thus, he proclaims her “a mess.” The hospitalist pieces together this emerging understanding from various cues, extracted from memories triggered by reading his own words and from seeing a long list of admission and discharge notes in the patient’s medical record.

Next the hospitalist turns his attention to another note in the record.

He then looks at a more recent note from her last hospital discharge, reading a point or two aloud, “nausea and vomiting” and “poor historian.” (P101, hospitalist, Field notes)

He selects the *most recent* hospital discharge note. I noticed a tendency among physicians to give more attention to recent notes rather than to older notes in general, although there were exceptions. Perhaps this attention to the more recent is understandable. As one physician explained, such notes are likely to be more up-to-date and will, therefore, give a better sense of the illness trajectory. Still, at this point the hospitalist did not select *the* most recent note in the record—that was a note from a rehabilitation facility. Rather, he selected

the most recent note from someone on his own service—the last hospital discharge note. Many hospitalists I talked with expressed a particular appreciation for hospital discharge notes because these lengthy notes tend to be detailed, contain summaries of the entire hospitalization, and often have the most up-to-date medication lists.

While it is possible that he noticed multiple cues in the discharge note, at least two were noteworthy enough that he voluntarily said them out loud. One was a symptom, “nausea and vomiting,” which the patient was experiencing again. Often in making sense of a present complaint or condition, physicians look to a patient’s past medical histories for clues. Many of the illnesses for which patients are admitted to hospitals are chronic in nature; therefore, knowing what a patient has experienced in the past may give insight into what that patient is experiencing in the present. In other words, physicians use what they can glean of past medical histories to develop more plausible abductions to explain the patient’s current illness.

The second cue he mentioned aloud was a characteristic of the patient herself: “poor historian.” This term, which I heard various physicians in both the ED and inpatient settings use, is meant to indicate that the patient has difficulty recalling details, has trouble remembering accurately, or otherwise does not provide fully trustworthy accounts of his or her past medical history. Seeing such a phrase in the record may have the effect of making the physician more alert for inconsistencies when speaking with the patient.

Finally, the hospitalist focuses on identifying the underlying cause of the patient’s illness.

“What we need to figure out is why she is in renal failure. Her last visit, what did her labs look like?” He asks aloud of himself. He then looks over the discharge note from the rehab facility (P101, hospitalist, Field notes)

His statement is a kind of effort to focus himself, to identify what is important and what he should do next. The EHR and other sources of information present an ongoing stream of

stimuli. The physician can become distracted. At times, some conscious effort may be required to readjust one's focus. In so doing, he returns to the issue that first triggered his attention and initial information seeking: the patient's renal failure. He prioritizes a task for himself: figure out why the patient's kidneys are failing. Put differently, he identifies a gap in his understanding—a gap which he deems significant to his ability to appropriately care for the patient—and then initiates action to begin the process of filling that gap. He immediately looks for lab results obtained during her most recent visit in order to compare these results with those obtained in the ED. In so doing, he is attempting to get a sense of her illness trajectory and her baseline, to see how acute her renal failure is²⁰. The acuity of the renal failure and the speed with which the patient's kidneys are failing may provide useful cues for hypothesizing the underlying cause. He will not be able to definitively diagnose the cause of the renal failure during this chart biopsy, but he has set that as a focus for his ongoing work of constructing his understanding of the patient.

4.4.1 Developing a Differential Diagnosis

Diagnosing is a central task of the work of physicians, but there is an important distinction made between differential diagnoses and final diagnoses. While the final diagnosis is intended as *the* explanation of the underlying cause of illness, a differential diagnosis is a list of all possible diagnoses that *may* explain the symptom(s) experienced by the patient. Doctors are trained in the importance of first developing a differential diagnosis—to think broadly about the many different potential causes. One ED attending explained.

We have a differential. When you look at a patient—for example, you have a patient that's short of breath. Based on the other symptoms that they have in addition to their shortness of breath and your physical exam, you will generate a differential diagnosis. So for shortness of breath it could be pneumonia. It could be a blood clot

²⁰ I did not capture details or data from her previous clinic visits, including those labs; therefore I cannot provide anything more specific about her illness trajectory.

in the lung. It could be a heart attack. It could be emphysema. It could be asthma. It could be that they vomited and they aspirated some vomit. It could be a collapsed lung. And I can go on. It could be a lot of things. That “it could be” is your differential diagnosis. (P204, ED attending)

Developing a differential diagnosis involves abduction, hypothesizing about possible explanations. This requires opening one’s mind to multiple possibilities and entertaining ambiguity, seen here in the repeated phrase “it could be.” Entertaining ambiguity appears to play a useful role in constructing an understanding of a patient. When I observed doctors as they sought to understand patient cases, I noted frequent usage of terms that indicated the tentativeness of the emerging understanding, including “possibly,” “possible,” “could be,” “maybe,” “I wonder,” “I’m guessing,” and “I don’t know if.” Entertaining ambiguity and remaining open to multiple explanations may be an important mechanism by which certain cognitive biases (Croskerry, 2002, 2003) are avoided or their influence minimized. Furthermore, entertaining ambiguity may be crucial to the ongoing work of updating an understanding—a considerable challenge for ED staff (Christianson, 2009).

One doctor told me, there are far more diseases than there are symptoms. The same symptom appears in many different illness conditions, as the ED attending quoted above clearly shows using shortness of breath as an example. She goes on to talk about the work of prioritizing among these multiple possible diagnoses.

And what you try to do is you try to prioritize those potential etiologies for the complaint into what is the most likely. So if they’re short of breath, they’re coughing and they have a fever and they have a sick contact, then maybe it’s more likely to be pneumonia than a heart attack. But if they’re short of breath, they’re sweaty, they’re 55 years old, they smoke, they’re a diabetic, then well maybe it’s more likely to be a heart attack. Or if they’re short of breath and they just came home from I don’t know Texas and they were in the plane for 6 hours and their leg is swollen well then it’s more likely to be a blood clot. So you kind of put together all the historical features and your exam features to generate a list of potential diagnoses. And that’s a big thing that we emphasize with our trainees and it becomes second nature. In your head you always have a list of what are the possible things that could be going on with this person and a lot of what we do diagnostically is confirm that our impression is correct or to click things off of the list. (P204, ED attending)

Prioritizing among the multiple possible diagnoses identified involves drawing on what the physician knows and has observed regarding the patient. It involves putting the patient's symptoms into the context of his or her physical condition, past medical history, and co-morbidities. The drawing together of patient information from a variety of sources makes it possible to see which diagnoses are more likely and which are less likely. This helps the physician know where to begin, where to focus efforts when ordering tests, labs and consults. Developing, prioritizing and working through a differential is an active process in which physicians must engage as they construct their understanding of the patient. Doctors tell me that some are better at it than others.

4.4.2 Understanding to Inform Action

Physicians construct understandings of their patients in order to inform action. Physicians seek out information about patients so that they may act in the best interest of those patients and achieve various organizational or personal goals. In other words, information is gathered and understandings are constructed not for the sake of knowing, but rather for the sake of acting appropriately. Thus, the process of constructing an understanding is often wrapped up in and feeds into other activities.

One such activity is triaging. When constructing an understanding of a patient, the physician is often attempting to determine how sick the patient is and to arrange for the most appropriate disposition plan. That is, the physician is trying to understand the patient's case in order to decide whether the patient requires admission to the hospital or could rather be safely treated in an outpatient setting instead. This disposition planning is a central activity of ED physicians, but inpatient physicians engage in it as well. As the following quote shows, physicians on the receiving end of admission handoffs do not necessarily take the proposed disposition plan for granted. Often in constructing their

understanding of the patient, they are assessing for themselves the appropriateness of the disposition plan.

Is this person appropriate for me to take care of? Can I provide a service for this person? And/or would this service be best provided by someone else? So that's what I'm thinking about. (P106, hospitalist)

There is more to triaging than planning disposition. Understandings are also developed to help clinicians triage in the sense of prioritizing their work. Hospitals are busy places with many sick patients needing attention. When inpatient physicians are getting "slammed" with admission after admission, they have to triage in the sense of allocating their time among multiple patients. The understandings they construct are intended, in part, to provide information for making such decisions.

Another activity that is often wrapped up in and served by the act of constructing an understanding is anticipating or planning care.

I'm also thinking, 'What are they going to need when they go home?' You know, and I have to have those questions in mind right from the get-go, even when I'm admitting, even sometimes at the point of the chart biopsy so that I can anticipate their care. (P106, hospitalist)

This hospitalist explains that physicians are often engaged in planning care right from the point they first hear about a new patient, including while taking the handoff or conducting a chart biopsy. While taking the handoff and otherwise constructing an understanding of the patient, physicians are attempting to answer a variety of questions. What additional diagnostics are needed? What consultations should be ordered? Will Social Work need to be involved to help place the patient in a nursing home? What medications or therapies should be started? These and other questions direct the information seeking that contributes to the construction of understanding and thereby influence the understanding that results. Furthermore, that physicians on the receiving end of admission handoffs are actively engaged in such planning indicates that they are not passive recipients of information but active co-constructors of understanding.

4.4.3 Summary

As a result of information seeking or information encountering, physicians notice and extract cues that grab their attention. What counts as a noticeable cue is situated and depends on the context and the actor. The physician's own preconceptions and concerns, his training and experience, the design, functionality and usability of the tools and technologies used all appear to influence what gets perceived as important. Actors then embellish cues, connecting the concrete to the abstract. Through inferential abductions, physicians form hypotheses to plausibly explain what they are finding. Finally, all of these efforts to explain and diagnose—to construct understandings of patients—are wrapped up in various other clinical work, such as triaging, planning care, and, as we will see in Chapter 6, maintaining boundaries.

4.5 Discussion

This chapter makes several contributions. First, I have demonstrated that the one-way information transfer model is inadequate to account for the dynamic, interactive, evolving work of understanding patients, and I have proposed an alternative perspective drawn from social constructionism. Using the practices of handoff and pre-handoff chart biopsy, I have shown that understandings of patients do not emerge fully-formed, nor are they the sum of pieces of information gathered. Rather, understandings of patients are constructed and evolve over time, as physicians encounter, interpret, assemble, and perhaps reassemble information through socially-interactive processes within particular contexts and situations. As a result, multiple understandings of the same patient are possible. This means both that different clinicians may construct different understandings of a given patient, and that the same clinician might construct different understandings of a single patient at different points in time, in different situations, or in different sequences of information encounters.

The construction of understanding relies heavily upon the noticing and extracting of cues from a continuous flow of such stimuli, as well as on the work of abduction, inferring backward from what is observed to plausible explanations. Thus the quality of the cues noticed, the capabilities and preoccupations of the actors doing the extracting and abducting, the relationships among the actors, and the tools and technologies available are among the many factors that influence the resulting constructions. Such understandings are constructed not merely for the sake of knowing, but rather to inform action, to suggest what to do next.

All of this challenges the traditional information transfer model (see Figure 4.1) on which most handoff research and standardization efforts are currently based. Namely, the findings of this study suggest that efforts to standardize the information content provided by the party handing off responsibility may only yield limited improvements, because admission handoffs are not one-way transfers of information and understandings are wholes that are greater than the sums of their parts.

Second, in demonstrating four building blocks (i.e., illness trajectories, baseline, care trajectories, and rationale) that are used in constructing understandings of patients, this chapter offers tools for thinking about handoffs and how they might be improved. That is, rather than thinking primarily in terms of specific data points (e.g., blood pressure) or topics (e.g., “situation” in SBAR) to be covered in the handoff, we might look for the most effective ways to convey illness trajectories or identify the situations when expressing rationale is particularly helpful.

Third, in identifying and describing the pre-handoff chart biopsy, I have provided an account of an emerging information practice not previously documented. As physicians scan or read the patient record, they are not passively consuming objective information; rather, they are actively assembling an understanding of the experiences and actions of other

humans. They are searching the record for indication of rationale, attempting to glean from the documented actions and narratives of their colleagues the intentions and thinking of those colleagues and to consider alternative interpretations of data. In doing so, they make extensive use of their prior knowledge of their colleagues and of the hospital more generally. Consequently, chart biopsies have the capacity to change the distribution of information and the nature of the interaction during handoff. As a result of doing a chart biopsy, parties on the receiving end of handoff may be better positioned to propose and explore alternative understandings of patients and different approaches to care during the handoff conversation. This has the potential to enrich collaboration regarding the patient's case and to enable the hospital to act safely, efficiently, and effectively.

Pre-handoff chart biopsy is a relatively new practice emerging right before our eyes. Chart biopsies have always been possible wherever paper charts were in existence; however, EHRs open up new possibilities by enabling access to more diverse information prior to handoff. As EHRs proliferate we can expect to see more of this practice and other effects on coordination. Chart biopsies are increasingly being conducted by attendings before daily rounds or before rotating onto a service. Nurses conduct chart biopsies to inform themselves of the actions of physicians and other healthcare providers. Wherever EHRs make patient data available, we might expect to find staff conducting chart biopsies for a variety of purposes, likely changing the distribution of information within the organization, shaping understanding construction, and impacting various interactions. Thus, we would expect that chart biopsies—and by extension the EHR—are changing aspects of other clinical activities, from daily rounds to discharges, with potential impacts on patients and the organization. Considerable research is needed to investigate the practice and influence of chart biopsy across the healthcare system.

Fourth, this chapter has placed considerable emphasis on the actions of the physician on the receiving end of handoff—the party frequently overlooked or implicitly characterized as a largely passive recipient of information. We have seen that parties on the receiving end of admission handoffs are not passive, but are actively engaged in seeking information, extracting cues, and making inferences. In fact, we have seen that physicians on both ends of the handoff must engage actively in constructing understandings. Furthermore, in demonstrating that physicians construct understandings in order to be able to *act*—for instance, to triage and to plan care—this chapter suggests that efforts to improve or measure handoffs should consider how well handoffs are informing action. In other words, we might propose that one criteria of a good handoff is that, as a result of it, the receiving party knows what actions are needed and how to move forward.

4.5.1 Implications

These findings have implications for electronic health records and for further research.

Those who design electronic health records might examine the user interfaces, functionality, and usability of their systems with respect to the building blocks of an understanding and the practice of chart biopsy. Although I did not systematically analyze how the usability and functionality of the EHRs enabled and constrained the construction of understandings during chart biopsy, some of my findings do suggest that the design of the system influenced the understandings constructed. For example, participants relied on skimming and scanning as opposed to thorough reading, but the EHRs had little if any functionality specifically designed to support overviews.

This suggests opportunities to develop new functionalities to support chart biopsy and the work of constructing an understanding of a patient. For example, a function might be designed to draw clinical data from across visits to produce graphical representations of

the patient's illness trajectory. Similarly, baseline data could be presented alongside current data for easy comparison, and the system might highlight potentially concerning divergences between these data. Since rationale often provides the explanatory link between care trajectories and illness trajectories, we might look for new ways these three building blocks could be captured in the database of the system such that they might be visually displayed in a way that aids making sense.

This study has implications for additional research, as well. For example, further research is needed to uncover best practices of chart biopsies which could be useful for training purposes and for the design of future versions of EHR systems. In addition, although I have identified some of the building blocks of an understanding of a patient and described some of the work entailed in assembling that understanding, there is considerable more work to be done to develop a theoretical model of constructing an understanding that will hold across various institutions and tasks. Likely, constructing understandings of patients is central to many different aspects of clinical work. More research is needed to explore how the process may vary and what other building blocks may be used by other clinicians, in other settings, or in work other than admissions.

These building blocks may also be useful for developing new ways of evaluating handoff. Rather than measuring the accuracy or completeness of information transferred and retained, researchers might attempt to measure, for example, the match between the senses handoff parties have of a patient's illness trajectory post-handoff. This is not to say that the goal is always to agree, but rather to ensure that the receiving party at least knows what sense the party handing off has made.

4.6 Conclusion

Constructing an understanding of a patient is a complex, ongoing process that spans some period of time, involves input of information from multiple sources, and produces an

evolving sense of the patient that will guide diagnostic and therapeutic efforts.

Understandings are not received wholesale from some source, but are constructed, built up as new information is added over time. This suggests that the one-way information transfer model of handoff underestimates the complexity of handoff and the work of understanding patients. Electronic health records are useful tools in the work of understanding patients.

Perhaps more importantly, EHRs are transforming admission handoffs by empowering parties on the receiving end to construct their own understandings prior to taking handoff, potentially improving the quality of interactions and organizational effectiveness.

Chapter 5

Negotiating Entangled Ambiguities: Handoff as Situated Interaction

Obviously you're not going to make something up, but you're more likely to make it sound—worse, I think, is the way I would see it. You're more likely to make it so that it's not questionable whether or not this patient needs to be in the hospital, and—[struggles for words] not exaggerate, but, you know, at some point, it is kind of like you're—not—you're making it sound worse than it really is just so this [inpatient physician] won't argue with you. Um, and you know, I don't know that any of us do that on purpose, but we all do it. I've heard people do it. I've done it. You know, how can I convince this [physician] that this [patient] needs to be in the hospital? Um, rather than just telling them the truth, and saying, "Maybe you don't think they need to be [admitted], but I do." (P201, ED attending)

5.1 Introduction

In this chapter I demonstrate the situatedness of admission handoffs by examining the negotiation practices that both produce and address the many ambiguities that emerge and become entangled during admissions work. Emergency Department physicians engage in negotiations by *selling* admissions to various inpatient services, while physicians in Internal Medicine and Surgery services negotiate by *pushing back* against such selling efforts. These negotiation practices are partly intended to address at least three situational factors that contribute to entangled ambiguities: patient uncertainties, workload management concerns, and physician characteristics. However, the practices of selling and pushing back, in turn, can also generate these ambiguities.

Little research has examined the negotiation aspects of admitting and placing patients within the hospital, although a few have observed such negotiations occur (Apker et al., 2010; Apker et al., 2007; Eisenberg et al., 2005; Nugus & Braithwaite, 2010). Nugus

and colleagues (2009) briefly report on the practice of selling by ED clinicians at two Australian hospitals. They find that effective selling involves minimizing or maximizing aspects of the patient's case and sometimes emphasizing organ-specific concerns of particular specialties. Similarly, in a study of a toxicology ward in a large UK hospital, Hartswood and colleagues (2003) found that referring patients for care requires the psychiatric assessment team to artfully demonstrate a match between the patient's needs and the care offered by particular healthcare services. Both studies indicate that negotiation is a key factor in at least some efforts to coordinate care across organizational boundaries. The need to justify or sell admissions has been briefly noted in a few other studies as well (Apker et al., 2010; Apker et al., 2007; Eisenberg et al., 2005).

In this chapter I focus on my third research question: *How are admission handoff negotiations accomplished?* My goal is to provide a richly descriptive characterization of the negotiations of admission handoffs at one large teaching hospital, to demonstrate some of the variations in these negotiation practices, and to provide insight into the factors that motivate negotiations and influence their outcomes. The chapter is organized in three sections. The first section examines negotiations in handoff, with sub-sections providing an overview of the entangled ambiguities and descriptions of the micro-practices of selling and pushing back. The second section takes a closer look at these dynamics by examining the practice of presenting patients during handoff. In the discussion section I examine what this situated interaction perspective suggests for the improvement of admission handoffs.

5.2 Negotiations in Handoff: Selling and Pushing Back

The negotiations of admission handoffs may involve a variety of actions, but drawing from terms used by my participants, I describe two broad types of actions: selling and pushing back. Selling in this context is largely an attempt to influence another physician's understanding of the patient. ED physicians engage in selling to the extent that

they attempt to convince their inpatient counterparts to accept onto their services those patients whom the ED physicians are attempting to admit to the hospital. Pushing back in this context is largely an attempt to argue for an alternative understanding of the patient or a different disposition plan. Both surgeons and internal medicine physicians engage in pushing back to the extent that they resist selling and related attempts to admit patients onto their services. I discuss selling and pushing back separately in greater detail in subsections below.

An overview of the policies of Memorial Hospital relating to admissions is useful context for understanding the negotiations of admission handoffs. Memorial Hospital is a complex organization of many medical and surgical services nearly all of which admit patients. Thus, having reached a decision to admit a patient, the ED physician must determine the most appropriate service. While hospital policies offer some guidance for placement, the variety and complexity of patient complaints and the uncertainties surrounding the diagnosis or the expected future trajectories of some patients' illnesses make it impossible for policy to dictate clearly all placement decisions.

To provide assistance for making decisions regarding placement onto Internal Medicine services, an internal medicine triage physician, typically a second-year resident, is stationed in the ED at all times. It is important to note, however, that this resident only advises on placement decisions. The suggestions he or she makes are not binding. Admitting physicians on the Internal Medicine services sometimes push back against placing particular patients onto their services despite the placement having been suggested by this triage physician. Furthermore, ED physicians do not always consult this triage physician for advice. In my observations, however, when advice was sought from the triage physician, it was also followed.

Policies regarding which services may or may not refuse particular kinds of admissions contribute to the dynamics of negotiation. At Memorial Hospital, Emergency Department physicians have the right to admit patients. That is, once ED physicians submit the online admission request form, the official admission process is set in motion and the patient is “locked in for admission,” as one attending put it. Surgical services at Memorial Hospital have the right to refuse an admission. Depending on the details of the patient’s illness or complaint, the Internal Medicine sub-specialty services may also refuse to admit certain patients. The only division of Internal Medicine that has no allowance by policy for refusing admissions is General Medicine²¹. As a result, some of my participants referred to General Medicine as “the service of last resort” and a “dumping ground.”

The process of admitting to Surgery is somewhat different than the process of admitting to Internal Medicine. With Surgery, the ED physician must first request a consult from one of the surgical services. The resident or fellow who is providing consultations for that service at that time will then examine the patient, potentially request additional testing or consults, and then make a decision as to whether or not the patient will be admitted to Surgery. If the Surgical admitting physician refuses to take the patient, and the ED physician feels strongly that the patient cannot be discharged, the ED physician must then admit the patient to an Internal Medicine service.

When ED physicians have patients they want to admit to Internal Medicine, it is not necessary first to get a consult from Internal Medicine. Instead, ED physicians simply perform a handoff directly to the admitting physician on the service to which the patient is to be admitted. Although policy does not allow for General Medicine physicians to refuse admissions, General Medicine physicians at Memorial Hospital do in fact frequently question the disposition plans proposed by ED physicians. For example, General Medicine

²¹ General Medicine includes the Hospitalist service and the General Medicine residency services.

physicians may suggest that some patients do not require an admission and may be safely treated in an outpatient setting, or they may argue that particular patients would be “better served” on a different service of the hospital. These are the practices of pushing back that figure in the negotiations of handoff.

The remainder of this section is divided into three parts. First I provide an overview of the entangled ambiguities of admission handoffs. Second, I discuss the practices of selling admissions by ED physicians. The section concludes with a discussion of the practices of pushing back—the responses by inpatient doctors to the selling by ED physicians.

5.2.1 Entangled Ambiguities

There are at least three sets of factors that situate the interactions and contribute to the ambiguities of admission handoffs: patient uncertainties, workload management issues, and physician characteristics. These factors situate handoff interactions in that the ambiguities to which they contribute must be interpreted dynamically and in context by the involved parties. In addition, the ambiguities related to these three factors are frequently entangled in the sense that they can become twisted up together such that they are not easily separable, and parties may have difficulty interpreting the actions of their handoff partners. As background for later discussions, I provide a brief overview of these three factors and then explain what I mean when I say that they become entangled ambiguities.

First, there are numerous uncertainties pertaining to the illnesses of many patients who present in the Emergency Department. For example, patients may be complicated, with multiple morbidities such that the treatment of one illness may negatively affect another. In addition, patients often present in the ED at early points in the trajectory of a new illness episode, before the source and nature of their complaints are clearly evident. Fully diagnosing patients often takes considerable time, and various pressures—many of which

pertain to workload concerns—motivate ED physicians to disposition²² patients out of the ED before diagnosing can be completed. Hence, it is often inevitable that some amount of uncertainty still surrounds patients at the point when they are handed off for admission.

Second, hospital workloads fluctuate from hour to hour, from day to day, and differently in each service. Although some patterns may exist (Reddy et al., 2006), these fluctuations are not perfectly predictable. Capacity issues further contribute to workload management issues. The ED and the various inpatient services all have limited numbers of beds, and Memorial Hospital often operates at or near capacity. Physicians in both settings understand the need to match patients with particular services and beds to ensure all patients receive appropriate levels of care. Unknowable future patient loads make this task difficult. When, for example, one bed remains on the Cardiology service, it can be difficult to know if a heart patient being admitted from the ED should be given that spot or if instead the patient should be sent to a General Medicine unit to save the bed in case an even sicker heart patient should show up.

Additionally, in both the ED and inpatient settings, physicians attend to multiple patients in parallel. Time and effort devoted to individual patients and decisions made regarding the placing of individual patients must therefore be balanced with the time and efforts provided to and decisions made regarding entire units of patients (Apker et al., 2007; Eisenberg et al., 2005). Maintaining a reasonable, even workload may make life easier for the clinician, but it may also be important for ensuring that safe, high quality care is provided to all patients on a given service. Thus, efforts to negotiate that stem from workload management concerns contribute to ambiguity in handoff in that such efforts may be perceived as work avoidance at one extreme or as resilience at the other.

²² Many of my participants used the term disposition as a verb to refer to the action of sending a patient out of the ED either to another service, another institution, or home.

Third, the interactions and negotiations of handoff are shaped by the characteristics of the individual parties involved and the medical and surgical specialties they represent. There are several dimensions of individual characteristics along which handoff parties can vary and which are significant to negotiations. According to many of my participants, some physicians are more “troublesome” or “confrontational” while others are more “pleasant” or “collegial.” With respect to the issues of admitting patients more specifically, some physicians are more cautious, willing to admit patients even when there is little objective evidence to support the decision—“just to be safe.” These individuals are said to have “low admission thresholds” and are sometimes referred to as “sieves” because supposedly they allow almost any patient to be admitted. At the other extreme are physicians who require considerable supporting evidence before they will admit a patient. These individuals are said to have “high admission thresholds” and are sometimes referred to as “walls”—particularly if they work on an inpatient service—because supposedly they frequently resist pressures to admit patients. Similar terms and differentiations have been noted elsewhere (Nugus et al., 2009; Shem, 1978).

Furthermore, physicians vary in terms of their background, training, past experiences, specialization, and expertise (Abraham & Reddy, 2010; Apker et al., 2007; Horwitz, Meredith et al., 2009; Nugus et al., 2010). For example, ED physicians are focused on life-threatening illnesses and much of their work centers on stabilizing patients. Internal Medicine physicians, by contrast, are focused on a wider range of chronic and acute illnesses and much of their work centers on identifying and treating the underlying causes of disease. Doctors in a teaching hospital range from novice first year interns to wizened veterans with thirty, forty or more years of practice. Ambiguities emerge as physicians attempt to discern whether the actions of their handoff partners stem from variations along any dimension of an individual characteristic.

These various factors contribute to entangled ambiguities. In any conversation there may be ambiguities. For example, when phrases that could mean more than one thing are uttered, involved parties have to draw upon culture, relationships, experience or contextual cues to create and clarify meaning (Clark & Brennan, 1991; Gee, 2005). However, my intent is to capture something beyond what we might call simple ambiguity: *Do you mean X, or do you mean Y?* Instead, the ambiguities that occur in admission handoffs are often complex, multifaceted. It is not simply a matter of unclear meanings of utterances, but also a lack of clarity regarding what lies behind those utterances: an insight into an unusual manifestation of an illness? an overlooked explanation? a misdiagnosis? a distracting work environment? inexperience? incompetence? stubbornness? arrogance? a keen insight? or one of any number of cognitive biases that frequently hinder clinical reasoning? or something else? Multiple concerns and possible explanations for the actions of one's handoff partner can emerge simultaneously and make interpretation highly complex. This complexity, I refer to as *entangled ambiguities*. The term may not clearly capture the phenomenon I describe, but my hope is that for present purposes it will serve to remind us that the equivocality of handoff conversation is often more complex than the term ambiguity alone would connote.

5.2.2 Selling

In a setting such as Memorial Hospital where handoff negotiations over disposition plans occur regularly, all patients have to be sold in the sense that their stories must be communicated in a way that clearly demonstrates two things: that the patient needs to be admitted, and that the service to which the ED is attempting to admit the patient is the appropriate service to care for the patient. Thus, ED physicians “sell” admissions in the sense that they attempt to convince inpatient admitting physicians to accept patients for admission. Put in a positive light, selling admissions simply means making “a good case,” as

one ED resident put it, for why the patient needs to be admitted to the particular service. Put most negatively, selling admissions may be thought of as a manipulative practice, in which ED physicians “spin” the patient’s case, exaggerating certain aspects or omitting others in an attempt to get the receiving service to accept the patient. Whether framed positively or negatively, I use the term “selling” to refer collectively to a variety of practices that are aimed at shaping another clinician’s understanding of a patient, typically with the intent of convincing that clinician that a particular disposition plan is appropriate for the patient. Selling is an *in vivo* term, used by several of my participants, as well as in at least two other studies (Apker et al., 2010; Nugus et al., 2009).

In the following interview excerpt, an ED attending characterizes selling as an important part of an Emergency Medicine physician’s job. He positions the process of selling in a positive or at least neutral light, suggesting that selling is not only a reality but also a necessity of ED physician work.

P206: So, I think it’s our job, in part, to sell patients. But, you can sell them on a number of different factors. “This is going to be a great patient.” “This is going to be an easy, you know, this is a 48 hour kidney stone.”

P.B.H.: Right.

P206: “And it’s going—it’s—you know, you’re going to make your quota, you know, you’re going to get to your cap faster.” [...] Alternately, there’s the—the call you made to the service and say, “Listen, I need your help. I don’t know what this patient has, but here’s what I found. [...] I need your help, I need your specialty.” So, appeal to their professionalism.

P.B.H.: Um-hmm.

P206: So, again, if you view that as salesmanship, absolutely. So, every patient should be sold. I think what happens is oftentimes, we internalize that because we—we do it for every patient or, you know, in a form, we do it for every patient.

P.B.H.: Sure.

P206: And we start thinking about how do I sell this patient to get this patient somewhere?

P.B.H.: Um-hmm.

P206: I mean, it’s easier just to be intellectually honest and say, “I don’t know what’s wrong with this patient, but he can’t go home and here is why.”

P.B.H.: Okay.

P206: And usually, you know, you don’t get much pushback on that. (P206, ED attending)

The quote touches on a number of issues that I develop in the sections that follow. First, the physician notes that selling is not a single practice, but rather there are many different ways that physicians can sell admissions. In the quote, this attending mentions framing the patient as “great” and the case as “easy.” He also talks about appealing to the professionalism of the receiving physician and distinguishes that from being “intellectually honest.” Second, the physician says, “in a form, we do it for every patient.” Selling admissions is not a rare practice or one that only happens in extreme cases. As the quote indicates it is an almost habitual practice in which ED physicians engage with every—or nearly every—admission. Third, he explains, “And we start thinking about how do I sell this patient to get this patient somewhere?” indicating that the intent of selling is to disposition patients out of the ED. Finally, in mentioning “pushback,” the excerpt reminds us that the practice of selling is part of a larger, interactive negotiation process that will involve responses to selling and may involve resistance or countermoves, which I discuss in the section below on “Pushing Back.”

When inpatient services push back against admissions from the ED, one result can be extra work for the ED physician. Typically, the ED physician must then find another service to admit the patient. This entails sending a second admission page, waiting for a response, and then retelling the patient’s story. With each repeated attempt to admit the patient, the ED physician has lost time that might have been spent caring for other patients. Knowing then that pushback is a common response to admissions and that it can create extra work and delay care, ED physicians may be more highly motivated to sell admissions persuasively.

As noted above, there are often uncertainties pertaining to various aspects of ED patient illnesses, including the interactions of co-morbidities, the level of acuity or “sickness”, the diagnosis, and the likely future trajectory of the illness. Time pressures, ED

workloads, and insurance reimbursement requirements typically make it impossible to retain patients in the ED until all of these uncertainties may be resolved. When uncertainties surround a patient's case, selling the admission potentially becomes more challenging. Where there is less clarity regarding the source of a patient's illness, for example, there is room for a greater number of interpretations, and a wider variety of disposition plans.

How ED physicians deal with patient uncertainties is an important aspect of selling and can contribute to the ambiguities of handoff conversations. While there are a variety of ways physicians might deal with patient uncertainties, two contrasting approaches are useful for analytic purposes. *Being honest* is the practice of acknowledging the uncertainties of patient cases while *overselling* is the practice of reducing uncertainties by misrepresenting patient cases. Both practices may be characterized as selling in the sense that they are efforts to convince the parties on the receiving end of the handoff to accept the patient for admission. These are not the only two possible approaches to selling admissions, but they are useful for gaining insight into many of the subtleties and challenges of handoff negotiations.

5.2.2.1 *Being Honest*

When there is a lack of convincing clinical evidence to make a strong case for admitting a given patient or for placing that patient on one service as opposed to another, ED physicians sometimes advocate the strategy of being honest.

In my opinion, it's always better to be honest ... and say, "Hey look, you know, I'm not sure what's going on here. This person's not that sick but there's something going on that we just don't want to miss. I can't put my finger on it now, you know, hopefully this is just nothing and you let him go home tomorrow but I think they need to come into the hospital" and I've found that's more effective as opposed to, some people try to you know, find every little, you know, minute thing that might be wrong and build a more robust case where there's just not enough robust information there to make it worthwhile. I think that's more dishonest and I think

that will get you into more trouble. So I usually just bite the bullet and say, “Hey, this is a pretty crappy admission, but, I’m sorry, I gotta do it”. (P203, ED attending)

This attending, like others, contrasts being honest with various other approaches, which he calls “more dishonest,” that might involve finding every “minute thing that might be wrong” with the patient in order to make the patient appear sick enough that the inpatient service would be less likely to contest the decision to admit. I take up this latter approach below in the subsection on “Overselling.”

Being honest is an approach that acknowledges—rather than obscures or avoids—the uncertainties surrounding the patient’s case, the motivation of workload management concerns, or the influence of physician characteristics. When “being honest” ED physicians note the lack of clinical evidence to support the disposition plan, admitting that the case is weak or that their understanding of the patient’s illness is incomplete. In such situations, the admission and disposition plan are often sold by means of persuading the admitting physician that the uncertainties of the case warrant further investigation in a hospital setting.

A physician’s *gestalt* plays an important role in ED work (Kabrhel et al., 2005) and in the approach of being honest. Gestalt has been defined as a first impression (Groopman, 2007). My participants talked about gestalt sometimes using related terms such as “gut feeling,” “clinical intuition,” and “my sense of the patient.” These terms capture the fact that gestalt is formed by a process that is not completely conscious but rather involves pattern recognition at what must be a somewhat subconscious level. Frequently, ED physicians will use their gestalt of the patient to make an argument for admitting and placing the patient, as in the quote above: “...there’s something going on that we just don’t want to miss. I can’t put my finger on it now....” The ED physicians who advocated the approach of being honest claimed that this practice reduces pushback from admitting services.

Physicians on the receiving end of admission handoffs also suggest the approach of being honest is effective in selling the admission.

It depends on how the doctor presents it. If they say, you know, “There’s something not quite right about this. This is going on. This is going on. This is going on. I’m not sure, but they’re too sick to send home, and I think they need to come in, and you guys need to figure this out.” If they put it that way, there’s no problem. But if somebody tries to bluff you in any kind of way, you’re like, wait a minute, what’s happening here? [...] So, it takes a certain amount of humility from the other doctor in order to be able to have a good communication about situations like that. (P106, hospitalist)

This hospitalist also contrasts being honest with more deceptive practices, such as trying “to bluff you in any kind of way.” Of course, it can be ambiguous if a particular statement made by an ED physician is an honest assessment or an attempt to bluff. The receiving physician must interpret this in context. Furthermore, this hospitalist connects honesty in such scenarios with “good communication,” and notes the challenge to ego. The culture of medicine positions the physician as the expert, even when interacting with colleagues, making it difficult to admit the limits of one’s understanding. This runs the risk of setting up a contentious negotiation dynamic (Fisher & Ury, 1981). But if safety and quality are to be fostered, a culture of openness—one in which uncertainty and ambiguity can be acknowledged and respected—must be cultivated.

Accumulated experience is an important foundation for forming a gestalt, and more experienced ED doctors tend to form gestalts that lead to more accurate diagnosing (Kabrhel et al., 2005). According to some physicians I spoke with, however, there is more to gestalt than just experience. As the following critical care attending explains, not all ED physicians are equally skillful at forming accurate gestalts.

ER doctors typically tend to have a very well developed, sort of intuitive sense that this person is sick. And there exist classes of ED docs who are very frustrating to me, but are clearly real—who are very good at telling sick from not sick, but utterly unable to articulate what about the sick person is actually making them sick. And that is...a group of people I’ve learned to value. Like, they’re psychic as far as I can tell, because they can’t actually articulate the medical problem. Um, there are also people in the ED who *perceive* themselves to be such but are much more poorly

calibrated. And so there are clearly [patients] who routinely end up in the ICU because someone has decided they're sick but is unable to articulate why they're sick and what's wrong. (P501, Critical Care attending)

As this attending explains, when ED physicians sell based on their gestalts, it can be frustrating for physicians on the receiving end of the handoff. Knowing something about the skill of the ED doctor and his or her track record with respect to forming accurate gestalts is needed. As this same critical care attending said to me later, "There are one or two [ED physicians] who are infamous for their poor calibration." As I discuss further in the following section, reputations influence handoff interactions and the work of interpreting the ambiguities of handoff.

But there may be some limits to being honest. For example, how frequently can an ED physician admit that he or she does not know what is going on with patients before others begin to question his or her competence? Similarly, how frequently can the practice of being honest be used before it loses its force of persuasion and comes to be perceived as a work avoidance tactic? Furthermore, because the tactic of being honest involves acknowledging that one cannot fully justify a conclusion, the tactic likely works more effectively for respected attendings than for less-experienced residents. These observations remind us that handoff is a social interaction, affected by reputation and status, and that the reception of one's actions in any given handoff may be influenced by how one has acted in previous handoffs. Furthermore, these observations reveal how entangled the ambiguities of admission handoff can be. Is a given statement about a patient an honest assessment of a troubling case, a work avoidance tactic, a sign of incompetence, or evidence of some other factor at play? Handoff parties must make such interpretations dynamically in context.

5.2.2.2 *Overselling*

The potential dark side of selling, which I call "overselling," invokes thoughts of deceit and of misrepresenting the patient's case or condition to accomplish the desired end

of admitting and placing the patient. For example, overselling may be used in cases where the ED physician lacks sufficient evidence for a particular disposition decision and is acting on his or her gestalt. Feeling unable to convince the inpatient physician based on the gestalt, the ED physician may result to exaggerating the patient's case, or otherwise attempting to make a poorly understood case appear more clearly understood. Other explanations for overselling include attempts to unload difficult cases, to avoid work, and to "clear out the ED" prior to the end of a shift.

None of the physicians I talked to directly suggested that overselling was a major problem, and yet the issue came up repeatedly, often in subtle ways, such as the hospitalist who told me patients aren't always "as billed." From the perspective of inpatient physicians, the concern is that an ED physician may "spin" a patient's case to make it sound worse, as opposed to deliberately lying.

I don't think I ever had any kind of gross examples of that. I don't think— [long pause] I'm trying to think. I mean, it gets hard, I think. A couple times I feel like a story has been spun to make the patient look sicker than they are because the attending in the ER is kind of a more conservative attending and wants them admitted. So kind of make it sound like they're in more pain or having more nausea than they really are to get them admitted to the floor. [...] There were a couple of patients that we discharged the same day. But from like the other perspective, I don't feel like they've ever intentionally left out a part of the story. I think just by the way medicine works and especially the way hospital medicine works is that patients change and sometimes what you think initially is going on isn't. (P111, General Medicine resident)

As the quote indicates, when an admitting physician finds a patient's condition does not match the description provided in the handoff, it can be ambiguous whether that patient's story has been spun or the patient's condition has simply changed.

The quote also touches on one possible motivation for spinning: pleasing a conservative attending. ED residents examine and assess patients, but ultimately an ED attending must approve the disposition plan. In some instances, ED residents find themselves in the position of having to sell an admission which they do not personally feel

is warranted. Spinning may be used as a means to accomplish the sale in such cases. In other instances, ED residents will be honest, confessing to the receiving physician that they are admitting the patient based on the ED attending's wishes, not their own.

Spinning is not falsifying lab values, test results, or vital signs. In fact, there would be no point in lying about this sort of data since it is available within the EHR. Notice, instead, the spinning involves emphasizing or exaggerating the subjective experience of the patient. Pain and nausea, the examples offered here, cannot be consistently and objectively measured—indeed, likely are not experienced the same by different individuals. Some patients' complaints relate to conditions that are better understood and for which there exist clear clinical measurements. Other complaints are less well understood. Abdominal pain is a good example that shows up frequently. It can be a symptom of a wide range of conditions from serious, including appendicitis and intestinal obstruction, to mundane, including indigestion. There are many patients whose abdominal pain cannot be diagnosed in the ED, but having ruled out the serious and life-threatening conditions, doctors may feel safe sending these patients home.

Of course, the term "ruled out" is a bit misleading since in the case of acute conditions, there may not be complete certainty that a given illness has been proven not to be in play. In other words, there may still be some uncertainty regarding the immediately future trajectory of the patient's illness. This uncertainty can give rise to concerns. Perhaps some important detail or clue has been overlooked. Perhaps this patient may be that rare case where a serious condition manifests itself in non-typical ways. Emergency medicine is characterized by a focus on life-threatening conditions and relatively limited patient-encounters. By the very nature of their specialization, then, emergency medicine physicians are likely to be highly attentive to concerns about urgent, potentially overlooked problems. Where such uncertainties and concerns are in play, some ED physicians would rather admit

the patient to be watched overnight, feeling that the additional time under close supervision will either increase confidence that the patient does not have a serious condition or will reveal further evidence that indeed the patient is very sick.

Although it is clear that overselling occurs and is on the minds of many of my participants, it is difficult to gauge the extent or frequency of overselling. It may not be socially desirable to admit to any practice that might be interpreted as deceptive, particularly in a healing profession such as medicine that prides itself on being authoritative and professional. It is possible that some engage in it more than they were willing to admit or that those who engage in it were not willing to participate in this study. Furthermore, given the many uncertainties surrounding ED patients, overselling is, to some extent, in the eyes of the beholder. That is, a handoff that stresses the sincere concerns of the ED physician might be interpreted as an oversell or exaggeration by the party on the receiving end.

Several ED physicians did talk about overselling, acknowledging that it happens, but distancing themselves from the practice, often by stressing the approach of “being honest,” discussed above.

I felt very strongly that my ability to achieve what I wanted to achieve for my patients was a very much linked to my credibility with the folks upstairs²³ and if I overstated someone’s illness because I didn’t know what was going on and I just want to admit them so I’m going to make them sound really, really sick, you lose your credibility and then you can’t have that conversation anymore, that give and take. (P204, ED attending)

I feel the people that perhaps maybe lie or over-exaggerate their cases—ultimately, they probably develop a bit of a reputation. And so when they call, and they have to, you know, try to admit these patients, I think it’s probably more difficult for them.... (P203, ED attending)

²³ “Folks upstairs” refers to physicians on the inpatient services. The ED is physically located on the ground floor of the hospital while the Internal Medicine services are located on various floors higher up in the hospital buildings.

These quotes indicate that a function in which ED physicians sometimes engage during handoff is reputation management. Overselling can damage one's reputation, hindering one's ability to interact effectively in the future. While each patient is an individual case, and patients are admitted via separate handoffs, the interaction in any given handoff—the trust and confidence between the parties—can be influenced by previous interactions.

Furthermore, just as ED physicians talk to one another about which inpatient physicians are “walls” who block admissions and which are “nice” and cooperative, so inpatient physicians talk among themselves about the reliability of particular ED physicians. Reputations spread, and they influence handoff interactions. The belief expressed in these quotes is that if receiving physicians believe that a particular ED physician has oversold a previous patient, there is some likelihood that physician is overselling the present patient.

You can use your free spin passes up quickly. You develop patterns and get pushback from the admitting service. So, I'm pushing harder to get these patients to go home now to maintain my credibility with the admitting team for when I really need it. Sometime I'll need the admitting service to take a patient on my word. (P205, ED attending)

The notion of “free spin passes” is instructive. The idea here is that goodwill between physicians in the different services exists but is not unlimited. One gets only so much benefit of the doubt, and there are cases where the ED physician needs to ask the inpatient physician to “trust me.” Tendencies toward overselling, thus, may be moderated by this shadow of the future.

Overselling may be a response to frequent pushback from inpatient physicians and the extra work such pushback tends to create.

I think that [having to retell the story over and over again is] terrible, and I think that's where people start to overstate stuff, because it's like, 'Okay, you're not hearing me, so I have to make this more fantastical for you so you get what's going on.' (P204, ED attending)

Because physicians on inpatient services frequently push back against admissions—a practice I discuss further in a subsequent section—it is not uncommon for situations to

develop where ED physicians have to call multiple services and retell the patient's story to different physicians before the patient finally gets admitted. The ED attending quoted here hypothesizes that this situation, which other ED physicians called "frustrating," serves as impetus for overselling.

The practice of overselling may be more prevalent among less experienced ED physicians. Picking up on the phrase "exaggerate the case" used by a third year ED resident during an interview, I asked him if he ever felt the need to exaggerate the case of a patient during an admission handoff. He replied:

Yeah. I think earlier on in my career. It's kind of—there are certain things where I had a little bit less experience in terms of obtaining objective data in order to convince [the] admitting service to take a patient. I think nowadays when I look back I do much less exaggerating. And I have a better sense of a person who is really sick and a person who isn't that sick. I feel like I haven't really needed to do that. I know previously when I started out as an intern, sometimes I kind of felt like I needed to [exaggerate] because I couldn't really build as good of an argument in terms of admitting a patient. (P211, ED resident)

This resident's comments, like those of several others, indicate that over time, as physicians accumulate experience seeing a variety of patients, they have a greater knowledgebase from which to draw. As a result they may feel more confident in their decisions about patient care and their abilities to present strong cases without needing to exaggerate. On the other hand, one hospitalist suggested that ED attendings "are the worst" with regards to overselling because, according to this hospitalist, "they've learned what they can get away with." So overselling may be interpreted as novice incompetence or work avoidance among other explanations.

When ED physicians take the approach of "being honest," they explicitly acknowledge the uncertainties of the case and the limits of their current understanding regarding the patient. Typically then—as the explanation goes—the receiving physician knows that there are important unknowns about the case, but that the ED physician is not hiding or obscuring details. As a result, there is little need to "read between the lines" and to

interpret motives. When ED physicians present a patient with more confidence, on the other hand, arguing that they understand the case and know what is going on, the receiving physician is potentially placed in the position of having to interpret whether this confident understanding is founded on a correct assessment of the patient or whether it is an oversell that is hiding uncertainties or underexplored possible explanations for the patient's case. But the difference between the two approaches may not be so cut-and-dried. What some might interpret as being honest, others may perceive as failing to take sufficient time to work up the patient's case. What one may interpret as an oversell, another may perceive as a well-understood, urgent case. I further explore the challenges of interpreting the entangled ambiguities that emerge during handoff negotiations in the section below on "Presenting Patients."

The existence of both practices in the same institution suggests a possible mutual constitution. Being honest works because it can produce a welcome contrast to the distrust engendered by overselling—actual or perceived. Overselling works, perhaps, because it can produce clarity and confidence where being honest might only produce ambiguity and confusion.

Selling, of course, is only one side of the negotiations of admission handoff. The responses mounted by physicians on the various inpatient services also play a role in shaping such negotiations. Having provided a description of some of the facets of selling, I turn now to a discussion of the practices of pushing back against admissions.

5.2.3 Pushing Back

If ED physicians sell admissions, physicians on the receiving end of admission handoffs have to respond to the selling. In many cases, inpatient physicians more or less "buy" the admission. That is, they accept the patient onto their service. Two important points with respect to such acceptance are worth noting before I move on to address other

responses to selling. First, just because inpatient physicians do not verbalize alternative perspectives on the patient's case or otherwise attempt to alter the disposition plan, this does not mean that they wholeheartedly agree with the plan. There are a variety of personal and social concerns that can lead to individuals not speaking up even when they sense an error may be occurring or has already occurred (Blatt et al., 2006; Christianson, 2009). My data suggest that there are indeed situations where, for a variety of reasons, an inpatient physician may accept without resistance an admission with which he or she disagrees. For example, physicians may not push back because they feel it would require too much time and effort, it would ultimately be futile, or because "that's just not my style." Second, even when inpatient physicians have no intention of disputing the admission or placement decision, admission handoffs still may involve negotiations over the understanding of the patient and the work to be accomplished.

I use the verb "push back," taken from some of my participants, to refer to any kind of resistance in admission handoffs. Receiving parties push back when they do not take for granted the understandings of patients or the disposition plans provided by ED physicians. Receiving parties often push back by asking questions to ensure that alternative diagnoses have been considered or different approaches to care entertained. Inpatient physicians also push back when they express doubts about the interpretation of patient symptoms, propose alternative diagnoses or dispositions, or suggest additional diagnostic work is needed before the disposition plan is settled. Pushback may be accomplished respectfully, in a pleasant manner or more aggressively or even confrontationally.

Pushback is sometimes motivated by an intention of altering the disposition plan, sending the patient somewhere else. Pushback then can lead to blocking or to punting or redirecting. Blocking is a term that some doctors use to refer to a practice of overtly refusing to accept an admission. When a physician blocks an admission, it is quite clear to

all involved that he or she does not intend to take the patient. Punting or redirecting, also in vivo terms, are more subtle and involve making a case that the patient would be “better served” on a different service, under the care of another specialty. However, pushback is not always intended to change the dispositioning of the patient. In fact, in many cases, pushback does not result in such a change. Rather, pushback is often simply an attempt to ensure that safe, appropriate care is being provided, that nothing serious has been overlooked, or that the patient could not be properly cared for with less intensive use of resources. Pushback, then, has the potential to pressure-test understandings and approaches to care.

When pushing back against admissions or placement decisions, physicians rely on their knowledge of medicine and disease processes to help them reexamine patient cases. In addition to such knowledge, however, physicians need to know certain details about a patient’s particular illness experience and the results of various tests and labs. To the extent that inpatient physicians must rely on ED physicians to provide these details, the persuasiveness and effectiveness of pushback may be somewhat limited. Electronic health records (EHRs) alter the distribution of information within the hospital and, therefore, have the potential to enable more effective pushback. Pre-handoff chart biopsy, as explained in the previous chapter, is the practice of selectively examining portions of a patient’s health record to gather specific data or information about that patient or to get a broader sense of the patient and the care that patient has received. Inpatient physicians at Memorial Hospital often quickly look at the patient’s record prior to taking the handoff, in part, to help them assess the disposition plan. As a result of doing a chart biopsy, physicians on the receiving end of the admission handoff may enter the conversation better informed about the patient and thereby better able to argue for an alternative approach to care.

In addition to using information gleaned from the EHR, some General Medicine physicians I observed made it a point to go to the ED as soon as possible after taking the

handoff to examine patients for themselves. One hospitalist told me that when inpatient physicians do not do this, they “lose an opportunity to be proactive.” He explained that he felt there is still a window of opportunity to alter the disposition plan so long as the patient is still physically in the ED. Once the patient has been moved to the floor, however, changing the service becomes more difficult and potentially creates a negative experience for the patient. But all physicians are not so proactive about going down to the ED. Another hospitalist told me, “I never go down to the ER. I avoid that place like the plague. I don’t remember the last time I was down there.” Furthermore, as yet another hospitalist noted, going to the ED to see the patient in person “implies acceptance” of responsibility for the patient and makes it more difficult to alter the disposition.

Pushing back happens when a party resists admitting a patient onto their service. This happens when General Medicine physicians—residents and hospitalists—push back against the ED physician’s attempt to admit or place a patient in General Medicine. Any other inpatient service can also push back against the ED. But pushback does not only involve negotiations between inpatient and ED physicians. Surgeons and Internal Medicine physicians attempt to redirect admissions to each other’s services, sometimes engaging directly in conversations with one another. Likewise, physicians on different Internal Medicine services negotiate with one another, suggesting the patient would be best served on the other’s service.

The degree to which a receiving physician might push back on some placement decisions may be moderated by the current work situation. For example, when things are busy and services are operating at or near capacity or admissions are coming in rapid succession creating a particularly hectic, busy context, the General Medicine physician may be more likely to push back on borderline cases that could be sent to another service that may not be as busy.

So partly because I think the decision to go to one service or another is sometimes arbitrary. So for example you have pneumonia, you could go to pulmonary because they deal with the lungs or you could go to general medicine. So I have a pneumonia patient, I want to admit them to general medicine. But they also happen to have a history of emphysema and they happen to be a little bit hypoxic so they need extra oxygen and the general medicine doc is perfectly capable of dealing with all this, but they may have just gotten four admissions, and they're feeling overwhelmed, and they say you know I really think that person would be better on pulmonary. And that's typically what happens. They try to punt to a service that would be equally qualified in caring for the patient. (P204, ED attending)

As the quote indicates, some patients have a condition that could arguably be cared for on either a General Medicine service or a subspecialty Internal Medicine service. All other things being equal, such a patient would typically be admitted to General Medicine so that limited beds in the subspecialty service might be reserved for patients who require the kind of attention only a subspecialist can provide. But all other things are not always equal. Sometimes the General Medicine services get "hammered" with admission after admission while a subspecialty service remains relatively quiet in terms of admissions. Sometimes, the opposite is true, and the subspecialty services fill up quickly. Thus, triaging for placement can be a complicated process in which physicians must consider not only the needs of individual patients, but also the shifting, ambiguous dynamics of workload management. The needs of present patients must be balanced with the current patient loads and educated guesses about unknowable future patients.

From the ED physician's perspective, pushback can be "frustrating," "really stressful," "a royal pain," "dreaded," and "thoroughly unpleasant." One ED resident characterized the negotiation aspects of admission handoffs as more stressful than caring for critically ill patients.

I think it's personally really stressful. That's kind of something that I think is one of the more stressful parts of my job. Like, I don't think necessarily I get as stressed out about taking care of a critical care patient as I do having to talk on the phone with Medicine and have them like, you know, ask me questions I don't know the answer to, or kind of try and—not bully me, but have them *suggest* that maybe I've mismanaged the patient in the department or maybe, you know, that this is *clearly* something else, and they shouldn't be admitted. And I think that's the part of my job

that I don't really like and I feel like I'm not good at yet. So, yeah, that is hard. (P214, ED resident)

This quote touches on one of the more delicate aspects of receiving pushback, namely that it can feel like judgment, a questioning of one's competence. Whether intentional or not, pushback by inpatient physicians can send a message to the ED physician that he or she has misunderstood the patient's case or otherwise made poor decisions.

As with selling, pushing back may be viewed from at least two contrasting perspectives—avoiding work and pressure-testing—and in my conversations with physicians in various services, both perspectives were expressed. I do not suggest all pushback efforts are one or the other. Reality is not so simple. I organize my discussion around these two perspectives, however, because they demonstrate the considerable variety in the practice of pushing back and the ways that practice can be interpreted.

5.2.3.1 *Avoiding Work*

Pushing back may be characterized as work avoidance, such as not wanting to take a difficult or uninteresting case, or attempting to maintain a manageable total workload. This is the more cynical viewpoint, most often expressed as an explanation for the actions of a physician in another service, as in the following ED attending's comment on Orthopedic surgeons.

A lot of times people who fall and break their hips are little old ladies, and orthopedic surgeons don't want to take care of little old ladies because they're complicated. (P201, ED attending)

I do not offer this quote as the "truth" about Orthopedic surgeons, nor do I intend it as a criticism of them. Similar kinds of comments were made by surgeons of ED physicians and by internal medicine physicians of their counterparts in both the ED and surgery. Rather the point I wish to make is that physicians do construct interpretations of one another's actions, frequently attributing certain characteristics and motivations to an entire specialization.

This can, in turn, set up a particular dynamic that may influence the interaction in future handoff situations. Whether or not work avoidance is in reality what motivates much pushback, it is nevertheless part of the way that physicians sometimes interpret the actions of their handoff partners.

When patients have particularly complicated medical histories, often involving multiple morbidities, arguments can be made that more than one service is appropriate for placement. However inpatient physicians—surgeons and internal medicine doctors alike—can be hesitant to accept patients with co-morbidities that lie outside of their own expertise. Admitting such patients can therefore entail multiple failed attempts to hand off the patient and create frustrating scenarios for ED physicians as the following, rather long but insightful quote illustrates.

The other situation that happens is that sometimes [a patient] has two things going on. So for example you have someone who has a really bad flare of their emphysema. They're really short of breath, and because of that it's put a real strain on their heart, and now they have an abnormal rhythm of their heart. So you're trying to admit them to Pulmonary because you think that the reason they have the abnormal rhythm of the heart is because of the respiratory status. And Pulmonary says, "Oh, no, no. We think that they are two separate issues and you should admit to Cardiology to get the heart rate under control, and we'll have our consult fellows see them about the emphysema. And you have the cardiologist saying, "No, no, no. This is a pulmonary problem. And the heart is just a second, a side victim, and it has nothing to do with us. And what are we going to do with this? And they're going to be on our service for four days recovering from emphysema, and this is ridiculous, and this is not what we do." And then they go back and forth, and they won't talk to each other. They only want to talk to you. So we had a situation like this just a week and a half ago. [An ED resident] just put down the phone and said, "Oh, my goodness!" [She puts her hands up to her throat and makes a sound to simulate being strangled.] Because she had three services--she had General Medicine, Pulmonary and Cardiology all going ring around the rosy saying, "Oh, no. Not me. Not me. Not me." At 11:00 in the morning no less! So she finally left it as, "You guys talk to each other, figure out who it is and then call me back." [...] So yeah. It happens everyday. Multiple times a day. Multiple times. [...] It's demoralizing because you're trying to get the patient to the right place to people who are going to care about them and it makes you feel like they don't care a lot about the person as an individual and it's draining. Because it's one phone call after another. It's people complaining in your ear about how this isn't right. And they're not the one to do this and blah, blah, blah. That's not good. Not good. (P204, ED attending)

In Chapter 6, I take up the challenges involved in matching complicated patients with the complex divisions of labor within the hospital. For our purposes here, this story nicely illustrates how pushback—from the perspective of the ED physician—can seem like work avoidance and evidence of a lack of care for patients. As the quote indicates and as other ED physicians told me, scenarios such as this one are not rare, at least in the sense that disputes break out daily over the placement of patients. In such scenarios, the patient’s time in the ED is often extended while the dispute is resolved. The ED physician typically has to make multiple telephone calls to various services and retell the patient’s story, which raises concerns about the degradation of the quality of the story with each retelling. The whole experience can be frustrating and “demoralizing” for the ED physician, as well. In the quote above, the ED resident’s tactic of letting the inpatient physicians “figure out who it is and then call me back,” is one several ED physicians advocate in such situations.

But work avoidance is not the only possible interpretation of pushback. Something far more productive and valuable may also be happening when inpatient physicians resist the disposition plans proposed by ED staff.

5.2.3.2 Pressure-testing

Pushing back may also be viewed more positively, as pressure-testing the robustness of the diagnosis, the appropriateness of approaches to care, or the impact of the disposition of one patient on the safety and quality of care of an entire unit of patients. Pushing back may be a re-examining of the patient’s case, the subtle suggesting or overt stating of an alternative viewpoint or interpretation. Pushing back may thus be evidence of the active involvement of the receiving party in thinking through the patient’s case. As such, pushing back may signal that collaboration is happening, assumptions are being challenged, differential diagnoses are being expanded, the use of resources is being reconsidered, or other such matters are being examined from an alternative viewpoint. Thus, pushback as

pressure-testing is an active effort to avoid the many cognitive biases that are known to threaten safety and quality of care (Croskerry, 2002, 2003).

When workload management concerns play a part in pushback, work avoidance is not always indicated. Sometimes such concerns are evidence of pressure-testing. Each admission represents considerable amount of work for the admitting physician in terms of coming to understand the patient's case, writing orders, and otherwise getting care started. When multiple new admissions come in fairly quick succession, a physician who is handling admissions for a service can soon become swamped. Then concerns naturally arise about quality of care and safety. With multiple patients needing to be seen and for whom orders need to be written, the physician has to prioritize, meaning some patient must wait. In the following quote, recorded during a field observation, the hospitalist was having a particularly busy afternoon. He had taken six new admissions in less than three hours and was about to call for the handoff of the seventh. He talked to me about trying to redirect some admissions during busy times as a way of keeping things safely manageable, and of the time tradeoffs of pushing back versus simply accepting another patient.

It takes time to fight an admission, so you have to decide is the time you're going to take to try and argue that this admission either shouldn't be admitted to the hospital or should be admitted to someone else is worth the time you lose to see other patients. I mean, it's a fine balance. And obviously, you know, I mean, a patient who should be on our service absolutely should be on our service. I mean, that's not a problem at all. But, when you're getting this many admissions, you have to sometimes say, 'Hey, listen, this is inappropriate' or 'this guy needs to go someplace else.' Not just because you're busy but because they don't match your service. But that takes time and effort and—ill will, so it's usually best to avoid it if possible.
(P104, hospitalist)

Physicians must balance multiple concerns dynamically. The tendency to push back against admissions that are borderline, that is, arguably could be sent home or to another service, increases as patient workloads increase, in part to ensure the safe management of the entire service. However, this increase is moderated by perceptions of the amount of time and effort involved in pushing back and by concerns over any ill will such pushback

might engender between services. As further evidence that workloads figure into patterns of pushback, consider the following field note excerpt from an observation of another hospitalist on a particularly slow night.

I ask about admitting to Gen Med versus a subspecialty, since before she called, P106 suggested the decision to admit to Gen Med might be premature. P106 says the patient could have gone to a subspecialty service, but added, "It's quiet. I'll take him. If he turns out to have a blockage [in his liver or kidneys], I'll call the Liver Fellow." The patient is dying, but there is a chance there might be a reversible blockage—something they can treat and relieve some of the symptoms, if not heal him. (P106, hospitalist, Field notes)

During the chart biopsy, this hospitalist realized that the patient might have a blockage, as the field notes indicate, and this led her to think the patient might do better under the close supervision of a GI specialist. However, the handoff conversation settled her concerns about any immediate problems from such a blockage. This reduced concern, combined with the slower pace and lighter patient load, made the hospitalist feel more confident that her service could safely handle the patient.

Just as ED physicians sometimes see work avoidance as being the motivator behind pushback, they likewise sometimes attribute more generous intentions, as the following demonstrates.

Hospitalists actually do a lot of teaching for us, which is really nice. I like them very much and some of them will come up with a differential [diagnosis] and say, "Did you think about the thyroid? Did you think about this and this?" And if I didn't, I'm like, "Nope, that's a great idea. I didn't think about that. I certainly will add it to [the patient's] studies...." (P213, ED resident)

Here the ED resident frames pushback, at least in some instances, as being a learning opportunity. Pressure-testing can identify deficiencies in an understanding or disposition plan and, thereby, provoke a rethinking of the case. The teaching that the resident says hospitalists are able to provide during handoff may stem partly from the differing amounts of experience between the parties (i.e., one is an attending physician and one is a resident). However, the teaching opportunity also stems from the differences in the orientations of

their respective medical specializations. Emergency medicine physicians tend to be focused on urgent and life-threatening conditions, while general medicine physicians regularly treat a wider array of chronic illnesses. Admission handoffs, then, can be a meeting of minds, which by reason of the differences in the nature of their training and daily experiences are able to share different perspectives on the case.

5.2.4 Summary of Negotiations in Handoff

Admission handoffs are negotiations in which ED physicians attempt to sell admissions and inpatient doctors push back against such attempts. Furthermore, the actions of selling and pushing back seem to play out in a mutually generating cycle. Selling fosters pushback. Pushing back creates a need to sell. Negotiation becomes part of the character of admission handoff.

The actions of selling and pushing back emerge in part as a means of addressing several entangled ambiguities of hospital work. As noted, patients who arrive at emergency departments, particularly of large, highly-specialized trauma centers such as Memorial Hospital, often have complex assortments of conditions and illnesses and are typically at early points in the trajectory of a new illness episode. These matters give rise to ambiguities about either the nature of the illness or its future trajectory or both. In addition, workloads in all services of the hospital fluctuate and future influxes of patients are not completely predictable. Finally, ambiguities arise concerning the expertise and motivations of the physicians who engage in admission handoffs in general, and in the practices of selling and pushing back in particular. It can be difficult to know if the action of a particular physician in attempting to redirect an admission, for example, is evidence of work avoidance or pressure-testing a diagnosis. To further explore the situatedness and the entangled ambiguities of admission handoff interactions, I turn now to an examination of the activities involved in presenting patients.

5.3 Presenting Patients

Presenting a patient is a key communication activity in which physicians provide a narrative account of patient illnesses and the efforts of care provided. Physicians present patients in a number of situations and for a variety of purposes. Medical students and residents regularly must present patients to their supervisors who oversee their care of those patients. Physicians of all levels present patients when getting a second opinion from a colleague or requesting a formal consultation from a sub-specialist. Handoffs—certainly admission handoffs—are also frequently patient presentations. Standard accepted ways of presenting patients (e.g., SOAP notes) provide familiar frameworks for constructing the presentation of patients across these various activities. While each activity may have a different purpose, it is reasonable to expect that ways of structuring stories for one clinical purpose might influence how stories are also constructed for other purposes.

There are a few basic component parts of a patient presentation. These include a brief demographic overview of the patient (e.g., the patient's name, age and gender); a narrative account of the complaint(s) that brought the patient to the hospital (i.e., history of the present illness); and a brief summary with relevant details from the patient's past medical history. Patient presentations may also include recommendations for further care efforts, as well as, some information about the patient's psychological condition and social situation.

The term “presenting” obscures some of the complexity and difficulty entailed in the activity. I have identified five inter-related activities that seem to be regularly involved in presenting patients during admission handoff. Given my observations of within-unit handoffs and survey of the literature, I believe these activities are also common to other kinds of handoffs as well. The activities are filtering, sequencing, accentuating, summarizing, and crafting language. In presenting patients, physicians filter out some

details, while leaving others in. They sequence information in particular ways as they tell the patient's story. By various discursive and symbolic means, they accentuate certain details. Additionally, they may provide a big picture of the patient or illness by summarizing certain information. Finally, they craft language, using particular terms or phrasing to capture the attention of the receiving party. I describe and discuss each in greater detail below, showing how they influence the negotiations of admission handoffs and play a role in producing ambiguities.

In some instances these five activities may be habitual practices or a byproduct of ongoing clinical work. For example, the understandings of patients that ED physicians construct are shaped and evolve over time through a variety of activities including reading the patient's chart, examining and talking with the patient and family, reviewing test and lab results, and talking with consultants or other ED doctors. By the time the handoff to the inpatient service occurs, the ED physician has already filtered through information and, consciously or not, marked some information as more relevant and other information as less relevant. Such filtering may be a result of confirmation bias—seeking information that confirms one's suspicions (Croskerry, 2003; Nickerson, 1998).

All of this is not to say that the activities of presenting patients during admission handoff are always habitual or unconsciously motivated. On the contrary, clinicians do at times consciously engage these practices in efforts to achieve particular ends, as the discussions below demonstrate.

Whether consciously or unconsciously carried out, however, each of these activities has potential to produce framing effects (Tversky & Kahneman, 1981), that is, to influence the listener's subsequent thinking about the patient. Danger lies in various cognitive biases this may engender in the listener. Anchoring bias (Tversky & Kahneman, 1974) may cause the receiver to get stuck in the features of the case on which the presenter focuses, while

diagnosis momentum (Croskerry, 2003; Groopman, 2007) may produce an unquestioning acceptance of the presenter's interpretation of the patient's illness.

Having provided an overview of the activities involved in presenting a patient, I now turn to an examination of each of these five component activities, demonstrating how they figure into selling admissions and negotiating during handoff and how they contribute to the uncertainties and ambiguities that complicate such interactions.

5.3.1 Filtering

Typically, presenting patients effectively involves some amount of filtering. Clinicians usually know much more about their patients than they can or need to convey during a presentation of the patient; of necessity, handoff requires compression. Providing too much information runs the risk of overwhelming the audience and is a common problem, perhaps particularly for novices. Clinicians must therefore filter out the extraneous, irrelevant details which, if included, might only distract or confuse the audience. However, what constitutes "irrelevant" or "extraneous" is a matter of perspective and subject to debate.

Handoffs vary in terms of the level of detail at which the patient is presented. In some cases, the ED physician may run through the exact numbers of vital signs and labs, as in the following handoff excerpt:

ED Attending: His white count was, uh, 10.6, hemoglobin's fine, 16. His basic—he's hyponatremic at 126. Potassium is 4.8, BUN and creatinine are fine. His LFPs are, his uh, albumin is 3.3 but his total protein's normal at 6.8, alkaline phosphatase is 160—

Hospitalist: Um-hmm.

ED Attending: —AST's 135, ALT is 64, to the one ratio and then his libate's a little elevated 65 and his bili is 2.4.

Hospitalist: Um-hmm, the INR

ED Attending: Yeah, INR's 1.4. (H40; P223, ED attending; P121, hospitalist)

The strategy used here might be characterized as one of "being complete." Although the ED physician knows that these various lab data are all visible to the hospitalist within the EHR,

he nevertheless rapidly reads the values off in quick succession. With this strategy, there is little sense that the ED is hiding anything in an effort to spin the patient. Of course, it runs the risk of creating longer handoff conversations perceived as crammed with irrelevant or distracting details. Many of the lab values listed are normal and not out of the ordinary. Abnormal test results and lab values can be useful for building a case for admitting a patient or for placing a patient on a particular service. On the other hand, normal test results and lab values can be useful for allaying fears that the patient may be too sick for the chosen service. In other words, the question of what specific details to include is situated and the answer may depend in part on the objectives of the parties involved, as well as, the particulars of the patient's case.

Presentations of patients in handoff where numerous details are provided can create ambiguities for the receiving party. For example, how is the party on the receiving end to interpret the inclusion of so many normal lab values in the presentation? Is this simply a matter of inexperience on the part of the ED physician? Or is it a sign of failure to take sufficient time to determine what is important about the case? Is it simply an indication that the patient is stable enough for the floor? Or is it a sign that someone is deflecting attention from some other aspect of the case? There may be any number of possible explanations, giving rise to ambiguities which involved parties must interpret in context.

In other handoffs almost no specific numbers—vital signs or labs—are provided, as in the following handoff excerpt.

ED attending: [I] got a bunch of labs on her because she was complaining of chest pain and it's so hard to interview her because of her laryngectomy. I went ahead and did a CK troponin on her which are [sic] negative. She does have a history of PE—I forgot to mention that before—but her INR is 3.6. She's on Coumadin, and this seems to be much more related to COPD than anything else. [*She talks about the patient's wheezing and what medications were given to address this problem.*] So that's basically it. I'm trying to think if I've forgot anything? I told you about the chest x-ray, the EKG, the labs. I think that's everything. (H03; P204, ED attending; P101, hospitalist)

In sharp contrast to the preceding excerpt, in this handoff only one single lab value is specifically mentioned, the INR²⁴ of 3.6, and perhaps only because it is slightly elevated. The approach used here might be called “honing in,” as this same ED attending referred to it when I interviewed her. She talked about interns presenting all of the information they know about a patient—detail after detail: “It just goes interminable. So you hone in. You hone in. And I think that the more you’re able to hone in accurately on what’s really going on, the less grief you get.” This approach relates to what Patterson and Wears (Patterson & Wears, 2010) have called the use of stereotypical narratives, in which familiar patient or illness patterns are invoked and then attention is directed to those aspects of the current case that deviate from the stereotype. The focus then is on the out-of-the-ordinary. Anything that is not mentioned is implied to be not a cause for concern.

The honing in approach can also create ambiguities that the receiving party must interpret in context. For example, in only presenting one lab value, is the ED physician glossing over some borderline value or actually focusing on the only value that is truly relevant? Existing relationships between ED and inpatient physicians—or the lack of such relationships—can play a part in the emergence of such ambiguities and the interpreting of them. Some physicians I spoke to suggested that where trust has been established between physicians, such ambiguities are less common and the work of interpretation much easier. However, given the size of the staff and the patterns of rotation at Memorial Hospital, it is very common for the parties involved in admission handoffs to have little or no previous relationship on which to draw when faced with such ambiguities.

²⁴ INR stands for International Normalized Ratio, a measure of blood coagulation or clotting. The normal range for INR between 0.8 and 1.2.

Filtering plays an important part in effective selling within the context of admission handoff; however, it may be seen as both a beneficial and a harmful practice. From one perspective selective reporting is necessary for clear communication.

And the other thing is I think that because of experience, I know what they [receiving physicians] need to know. I know what pieces of information will help them to understand my perspective on the case and so I think I don't need to overstate the case, if that makes sense. [...] I think part of it is emphasizing the pieces that they *need* to know and that justify the admission. I think the other part of it is being able to cull the important information from the mass of information that you get from a patient. [...] Just knowing what to say. But not knowing what to say—not in a—not in a manipulative way. I don't consciously try to manipulate. (P204, ED attending)

Here, handoff is positioned as an activity of conveying one's understanding, and selectively reporting information is in service to this end. From this perspective, filtering is portrayed as not manipulating or overstating the case, but rather as helping another comprehend by removing unnecessary details.

A second perspective, espoused by some inpatient physicians, positions filtering as a form of "spinning," that is, intentionally presenting patient cases somewhat inaccurately to "make the patient look sicker" or otherwise strengthen the case for admission. This perspective suggests that the pieces of information that are filtered out of the presentation are potentially important and may be useful for constructing an alternate understanding of the patient.

The difference between the two perspectives then can be seen in the relative importance placed on the details that are omitted. To the one, they are distracting; to the other, essential. There is an inherent tension between presenting enough detail and presenting too much. When is a particular piece of information an extraneous detail, and when is it a useful building block in the construction of an alternate understanding? There may be no absolute answer to this question. To some extent, the unfolding handoff

conversation itself is an attempt to answer this question within the context of the present patient scenario.

5.3.2 Sequencing Information

Effective presentation requires sequencing information in a manner that aids comprehension, connecting pieces of information logically. While popular mnemonics such as SOAP²⁵ (Kilpack & Dobson-Brassard, 1987) and SBAR²⁶ (Haig et al., 2006) are attempts to provide a standard sequence for the presenting of patients, they only order the broad categories of information to be included. They say nothing about how individual pieces of information within any given category should be sequenced. When patients have complicated medical histories and multiple morbidities, for example, there is still the question of what to present first. Knowing details about one of the patient's illnesses can influence how one understands another illness. Furthermore, admission handoffs are interactive conversations. The party on the receiving end can and frequently does interrupt the presentation of the patient to ask questions or to propose alternate interpretations. These interruptions, which are often important for constructing understandings, make it difficult to adhere to a particular sequencing of information.

The initial information conveyed in a handoff begins a process of orienting the listener to the case. Physicians are not idle receptors of information who wait until the story is complete before they begin attempting to comprehend it. Listening and processing information go hand-in-hand and happen simultaneously. As soon as physicians begin hearing a case, their minds become engaged in the diagnosis and treatment processes, as the following quote discusses.

²⁵ SOAP stands for Subjective, Objective, Assessment, Plan.

²⁶ SBAR stands for Situation, Background, Assessment, Recommendation.

...if someone says to me, “This person’s sick. They came in coughing and they have [unintelligible] on the chest x-ray, oh, and by the way, they’re a lung transplant patient.” I mean that’s very different than if they say, “This person’s a lung transplant patient, and they’re coughing, and blah blah blah.” Because my mind is already oriented very differently in those two situations. The first sounds like community-acquired pneumonia, then when you hear “lung transplant patient” you think, oh, well, there’s a whole slew of things this could be. When it’s the latter, “They’re a lung transplant patient,” that’s up-front, you think very differently. And it’s usually not as glaring as that. It’s usually something much more subtle. But again, it’s sort of orientation. (P101, hospitalist)

Sequencing information is one way that ED physicians consciously or unconsciously foreground and background various aspects of the patient’s case. The order in which details are presented not only structures the story but also triggers particular trains of thought in the minds of the receiving parties, orienting them to the patient in certain ways. The sequencing of information, therefore, has the potential to shape understanding and to influence the subsequent interaction of the handoff. Effective sequencing may help sell the admission and disposition plan to the extent that it helps the receiving party see the patient from the perspective of the ED physician. Ineffective sequencing may complicate selling to the extent that it confuses or leads the receiver down a blind alley.

5.3.3 Accentuating

Accentuating various pieces of information is important for directing the attention of the receiving party over the course of the presentation, reducing the likelihood that the receiving party becomes distracted from the central thrust of the story conveyed. The most basic examples of such accentuating come in the form of verbal stress through vocal intonation or the use of particular words that signal importance. For example, one ED resident, handing off a patient, said, “I’m *really* worried about his heart,” emphasizing the word “really” by elongating the sound of the word and dropping the pitch of her voice.

Repetition is one verbal tactic that is used—intentionally or unintentionally—with the result of accentuating information. Repeating a particular point multiple times, either in

succession or at different moments during the presentation, can have the effect of drawing attention to that point, reducing the chance that it becomes lost amidst other details. Of course repetition may simply result from the party handing off becoming distracted and forgetting that a particular point has already been covered. Sometimes, however, repetition is a conscious action to draw the receiving party's attention back to a particular piece of information that is significant to the disposition plan. For example, in one handoff, when a hospitalist, began to suggest that the patient's chief complaint could easily be explained by a malfunctioning oxygen tank and hinted that an admission might not be necessary, the ED resident noted for the second time that the patient had an abnormal EKG report, indicating a potential heart problem. In so doing, the ED resident drew the hospitalist's attention back to a previously-mentioned aspect of the patient's case in order to reinforce the argument for admitting the patient.

Keeping attention focused in a certain direction sometimes requires downplaying the significance of other details. For example, in one handoff, an ED physician said of the patient, "She did have some nausea and vomiting, but that wasn't her main complaint." In so doing, he acknowledged the presence of the symptoms, but deemphasized them by downplaying their connection to the patient's purpose for coming to the hospital. Sometimes details are deemphasized by including additional information that rules out cause for concern. In one example, a patient with a severe dermatological condition was being admitted. In presenting the patient during the handoff, the ED physician relayed that the patient had remarked to his wife that he wanted to "end it all." This detail would naturally raise concerns on the part of a General Medicine physician that the patient might not be psychologically stable enough for a General Medicine floor, where staff resources are insufficient to watch patients closely. The ED physician attempted to diffuse this potential concern, even before the receiving party could voice it, by providing additional information.

“I’ve had [Psychiatry] see him,” the ED physician said. “They don’t think he’s suicidal or needs a sitter.” By presenting the additional information about the Psychiatric consult and thereby invoking expert judgment, the ED physician was deemphasizing the patient’s statement, and in turn selling the appropriateness of the disposition plan.

5.3.4 Summarizing

Effective presentation usually involves some degree of summarizing to provide an overall assessment of the patient and the disposition plan. These big picture statements may often appear near the end of longer monologues about the patient, but summaries may also be used at the start of the presentation to orient the audience and frame the ensuing presentation.

Not uncommonly, physicians will summarize near the end of handoff to reiterate and succinctly knit together multiple pieces of information to make the case for the proposed disposition plan. In one example, an ED attending said near the end of a handoff, “So bottom line, she’s refusing surgery for a broken hip, but can’t go home because there’s no one to take care of her, and she can’t walk.” This brief summary makes the case for both admission and placement on the General Medicine service. An elderly patient with a broken hip and no one to care for her is unable to leave the hospital; therefore, she must be admitted. The patient’s refusal to consent to surgery—as the preceding portion of the presentation made explicit—has resulted in the unwillingness of the Surgical service to accept the patient. These realities leave no other choice but to admit the patient to General Medicine.

Summarizing is useful near the beginning of handoffs as well, to frame the presentation. As one hospitalist I was observing told me, “you usually can tell within the first eight words [of the handoff] what kind of story you’re going to get.” He later explained that he wants to know “the context of the disease process,” not just a long list of details and

information “strung together.” What this hospitalist said he wanted to hear, early in the handoff, was the ED physician’s “gestalt distilled into one sentence.” Another hospitalist present for this conversation agreed, saying that the ED physician needs to have “synthesized the patient’s information.” Of course, the extent to which the ED physician can synthesize the patient’s information coherently will depend in part on that physician’s own experience and the relative complexity of the patient or the amount of ambiguity surrounding the patient’s diagnosis.

That these comments come from physicians on the receiving end of admission handoffs demonstrates the connection between selling and constructing understandings. One way that ED physicians sell admissions is by summarizing the patient’s information into a coherent, structured narrative that helps the receiving physician quickly grasp the “gist” of the patient’s case and understand why the patient needs to be admitted and why the chosen service is the appropriate one to admit the patient. Structuring the story coherently, drawing together details about the patient’s case in a logical manner that supports the disposition plan, can aid the process of comprehension in which the receiving physician must engage during handoff. Receiving physicians complain that incoherent stories, where information is poorly synthesized, raise more questions than they answer and can result in the receiving physician becoming distracted by irrelevant details.

While summary statements are useful for constructing understandings and for conveying one’s own understanding, such statements can also mask important details and potentially obscure other interpretations of the patient. Even when essentially correct, such statements may not suffice. Supporting details may be necessary. For example, sometimes evidence is summed up qualitatively in the form of a descriptor or assessment statement, such as “the patient is stable,” or “she’s not tachycardic.” But all qualitative descriptors or assessments are not equally objective. One General Medicine resident told me that his

biggest concern with patients coming from the ED is their stability. When I said I assumed this meant that he wanted more assurance than just being told that the patient is stable, he replied:

Yeah. So it's vital signs. Definitely, it's vital signs. That's what we regularly ask for. Usually also—it's a little bit of a matter of trust actually. If somebody were to say, "Totally stable. Has this and this and this," you get the vital signs, you may be okay, but there's a certain amount of distrust, of course, for your own safety because you want to have a really stable patient. There is another important thing where you can always judge these things by, of course, you want to know what meds were given in the ER. You know, if they say, for example, "This patient—no—blood pressure is good. It's ... 100 over 60," and [I ask] "You give any medications and any fluids?" "The patient got five liters. Before it was 85." This is not stable, you know? If somebody gets that many [sic] fluids, they'll get a blood pressure on the lower end, and then you get worried, and this is kind of a red flag that's coming up. (P109, General Medicine resident)

There are at least two important points for our discussion here. First, the resident is suggesting that it is best not to merely accept a qualitative assessment of the patient (e.g., "blood pressure is good"). Rather, it is important to get the actual quantitative measurement behind the assessment. As a general medicine service, his unit is less well-situated to care for patients who are unstable than a critical care unit would be. Hence, he says, "for your own safety because you want to have a really stable patient." Second, and partly as explanation for the first point, there are various interactions possible between care efforts and patient data. For example, on the one hand, vital signs are objective measurements; however, medications and other treatments can alter vital signs temporarily, masking a complete picture of the patient's case. In this example, the blood pressure measurement of 100 over 60 makes the patient appear stable. It is not until additional information is given regarding the amount of fluid provided in the ED that an alternative interpretation of the patient's stability become possible. The extensive amount of IV fluids administered may have raised the blood pressure to an apparently normal level but may be masking any of several serious conditions.

This excerpt demonstrates that even seemingly straightforward statements and arguably objective data can give rise to ambiguities that have to be interpreted in context. Is the patient indeed stable and the recovery underway? Or has the ED physician failed to consider that the patient's blood pressure might be artificially stable? Or might the ED physician be spinning the patient in an attempt to strengthen the case for placing the patient on a General Medicine ward rather than a critical care unit?

Gestalt, discussed above, is an intuitively produced synthesis that ED physicians sometimes point to in their attempts to sell admissions to inpatient services. In some cases patients cannot be clearly diagnosed in the time available in the ED, and there may be little in the labs, vital signs or radiographic imaging results to indicate a clear problem or that the patient is sick enough to be admitted. With such borderline cases, ED physicians will sometimes point to their gestalt, their gut feeling about the patient, as evidence to support the disposition plan.

That justification could—can easily be—or in a small proportion of patients is just probably going to be: “My gestalt is that this patient is sicker than he or she appears. And I don't want to send the patient home for this reason, and therefore, I want to watch him or her.” And that is as valid a reason as, you know, having a gunshot wound in the middle of your chest. (P206, ED attending)

Some physicians use the term “soft” admissions to describe situations where there is little concrete or indisputable evidence that the patient requires hospitalization. Of course, it can be more difficult to make a strong case for the disposition plan when that case depends heavily on evidence in the form of someone's gut feeling. There is no objective data to convey this gestalt, and most of the time the parties involved in the handoff have little or no prior relationship. In the quote, the ED physician says the patient is “sicker than he or she appears.” By “appears” he means how the patient would seem to be based on the lab values and test results in the chart. The physician's physical examination of or interaction with the patient, however, suggests a different picture. This different picture, however,

cannot be contained or expressed easily in the chart and is therefore not accessible to the receiving party via pre-handoff chart biopsy. If a patient's admission is based in large part on the gestalt of the ED physician, the handoff may be more likely to produce ambiguity for the receiving physician. Is the ED physician "overly-cautious," or has he actually tapped into a threat that the available diagnostics have failed to identify? A pre-existing relationship between the parties may be useful for interpreting this ambiguity, but such relationships are frequently non-existent in such settings.

5.3.5 Crafting Language

Part of effective presentation involves the skillful use of language—that is, talking about patients from the perspectives of the listeners, using their terminologies. Language is not neutral; it is a powerful tool that can be used effectively to shape understandings and beliefs. Part of the education and professionalization of physicians involves learning the vocabularies and normative phrasing of medicine, including not only formal but also slang terms. In learning to present patients, medical students and interns are often coached in the effective or accepted use of language. For example, while observing in the General Medicine residency service one day, I watched as a second year resident listened and provided feedback to a third year medical student as the student was rehearsing her first patient presentation, which she was to give to the attending later that morning. At several points, the resident stopped the student to correct her phrasing. In one instance the medical student described the patient's heart as "racing wildly." The resident interrupted her. "I wouldn't say 'wildly.' That makes me think of A-fib²⁷." She then instructed the student to "avoid excessive commentary, because it can distract from what's really going on." This example illustrates how the use of particular everyday words or phrasing can trigger specific impressions of the patient.

²⁷ A-fib is short for atrial fibrillation, an abnormal heart rhythm.

Part of effectively presenting patients during admission handoffs—and hence, of effectively selling admissions—involves crafting one’s language to conform to the perspective of the receiving party. Perspective taking has been shown to be useful for engendering social bonds and positive estimations of others (Chartrand & Bargh, 1999; Galinsky et al., 2005; Galinsky & Moskowitz, 2000). Similarly, where negotiators develop an understanding of and respect for the interests of their counterparts, the outcomes of negotiations are likely to be more mutually beneficial (Fisher & Ury, 1981).

Admission handoffs usually involve interaction between parties from different specializations, which tend to be focused on different categories or aspects of illnesses or different bodily systems. As a result, there can be differences in terminology and indicators different specializations may use. One ED attending told me that she felt able to sell most admissions because she knew “the key words that people want to hear.” Similarly, a resident in the ED told me that using the right “lingo” would “perk up the ears” of inpatient physicians and make them “want to listen more.” These comments speak to the power of language to capture attention and shape understanding.

To some extent, the terms or phrasing that an ED physician uses when presenting a patient during an admission handoff will shape the nature of the interactions of that handoff and the degree to which negotiations are necessary. Consider the contrasting approaches mentioned in the following interview excerpt.

I do think it helps a lot to know the diagnosis or to have a fairly, be fairly confident in the diagnosis, because when you talk to specialty services, if you have that diagnosis, you are able to talk about it with a little bit more intellect than if you weren’t sure what’s going on. For example if you have some patient that has a heart failure, that’s having chest pain. When you call up the Cardiology Service, you don’t have to just say, “This is a patient coming in with chest pain,” and they have to ask you all these questions. You can say, “This is a patient with a known ejection fraction,” which is the squeeze of the heart, “a known ejection fraction of 25% who’s now short of breath. It looks like he’s got elevated jugular veins that are consistent with this diagnosis.” You sound—they’re more confident in you because you’re more confident with the way you describe the patient ... and I think that helps a lot

as far as admitting to the correct services and getting the care the patients need.
(P213, ED resident)

In the example, the resident contrasts two approaches to presenting a patient during handoff to the Cardiology service. In the first approach, she might say, “This is a patient coming in with chest pain.” In the second approach, she would frame the patient in more specific terms, including “known ejection fraction of 25%” and “short of breath” and “elevated jugular veins.” The first approach is vague, includes no specialized terminology, and, as the resident suggests, will likely ignite a sequence of questions from the receiving party. In other words, the first approach will generate ambiguities. The term “chest pain” is used for a symptom that accompanies a wide variety of conditions, many of which either are not relevant to cardiovascular medicine or are not significantly serious enough to warrant the specialized attention of a cardiologist. Thus, the barrage of questions that would follow the framing of a patient as “coming in with chest pain” would be an attempt to sift through a variety of possible explanations to clarify ambiguities and arrive at a better sense of whether or not the patient’s complaint warrants specialty care. In the second approach, however, this sifting is accomplished by the ED resident in her presentation of the patient. If the first approach is vague, this second one is more definite. The specific terms used zero in on and make a strong case for an admission to cardiovascular medicine. The terms and the measurement provided would signal to a Cardiologist: this is relevant to my service.

In the second approach, the resident makes a connection between the confidence one would have in selling the admission and confidence that would be inspired in the receiving party. The skillful use of language to describe the patient’s condition conveys this confidence. As the resident explains it here, the confidence precedes the skillful use of language: first she understands the patient’s case herself, and then she is able to craft her language to convey that understanding in a way that is meaningful to the admitting physician on the cardiovascular medicine service.

There is an important learning dynamic behind the skillful use of language in handoff. Several of the ED physicians I spoke with and observed noted how they and others learn through experience how to craft their language to capture the attention of and to convince physicians on the receiving end of handoffs. As the following quote indicates, it is not formal training that provides the useful lessons.

There's definitely no lecture on it. I mean, you never sit in a class and somebody says, "These are the things you ought to give." Well, at least not in our residency [program], um, "These are the things you ought to give in any sign-out, um, or any handoff." There's none of that. It's kind of—you just do it, and after you get badgered by the admitting people enough times, [She laughs] you figure out what they want you to say, and "Oh, OK, I get it." And you can tell the difference between an intern on the phone with an admitting resident, and—and a, you know, fourth year resident on the phone, because the intern's stumbling all over the place and isn't quite sure what the other person wants. And the fourth year, they—they know what they want, you know? It's a—it goes a whole lot easier. So you do kind of learn. (P201, ED attending)

ED physicians learn on the job, over time, how to use language more skillfully. Getting "badgered" with questions enough times by the admitting service leads to figuring out what to say. Several times in this quote, the attending frames the challenge as knowing "what they want you to say." There are multiple ways any single patient might be presented—multiple ways his condition might be described. But the sense conveyed in this quote, and echoed by a few other ED physicians, is that some ways of using language to describe particular patients to particular specialists are better than others. As this attending asserts, it is through a process of trial and error that residents come to know how to use language skillfully in handoff, progressing from the intern "stumbling all over the place" to the fourth year resident who knows what the receiving party wants to hear.

Beyond trial and error, physicians also learn this skilful use of language from other clinicians. One resident described an experience of learning to present a particular patient suffering from liver disease to the GI service.

This was one case too where [the internal medicine triage resident] was helpful. There was some things on his [the patient's] electrolytes and in his labs that I

identified as a problem, but [the internal medicine triage resident] said—they were able to kind of educate me and say, “Actually, what I learned rotating on the liver service was that having hyponatremia or low sodium is actually a really—a harbinger of bad things to come for patients with liver disease.” And that was something that I didn’t really know so that was again kind of helpful. So when we called GI and talked with them, we said like, “Hey, there’s numerous things going on that would suggest that this guy has multiple organ systems complicated by his liver disease so this is why we think he should go to you.” (P214, ED resident)

In this instance, the ED resident is learning both more about illness and medical health indicators, and also how to frame the presentation of particular kinds of patients such that physicians on a particular specialty service will be able to recognize the appropriateness of admitting those patients to that service.

Not only do residents learn from their colleagues in the ED, they also learn how to think and talk about patients from the perspectives of other specializations as a result of their rotations through those specializations.

[As a result of rotating through other services] You get a better sense of what they’re looking for in terms of making a case for admission, and certain things that initially might have not appeared obvious to me to determine whether the patient goes to a certain place become more obvious to me. [...] The other thing is by rotating on their service, seeing what things that you realize that your colleagues [in the ED] didn’t do when the patient come up, and you’re like, ‘Oh, it would have been really great if I had this extra piece of evidence [for] taking care of the patient in ICU’ ... being on the other side. ‘Oh, it would have been useful if my colleague down in the ER would have done this first.’ So, it makes me think about it when I am trying to get the patient packaged up to go to a particular service. (P211, ED resident)

The practice of rotation during medical residency broadens the knowledge base of physicians, making perspectives of specialties other than their own available to them. By working alongside physicians in other services, ED residents learn what information is useful for work on those services and what framings of patients make most sense to physicians there. Likewise, experiencing admission handoffs from the receiving end helps ED residents understand how handoffs contribute to work downstream. This in turn can influence how the ED resident packages up patients in the future when he or she is back in the ED.

5.3.6 Summary of Presenting Patients

The task of presenting patients in handoff is not as simple and straightforward as the verb “to present” might suggest. Rather, it is a complex mix of interrelated activities in which physicians must engage—consciously or unconsciously—to tell patient stories. The negotiation aspects of admission handoffs, in particular, further complicate efforts to present patients. Because admission handoffs occur within multifaceted situations where parties must attend to concerns about unit workloads, reputations, and resource availability, as well as concerns about individual patients, numerous ambiguities arise from the presentation of patients. The same statement may be interpreted as accurate assessment or subtle manipulation; as insightful professional judgment or overly-cautious apprehension; as appropriately omitting irrelevant details or incompetently leaving out clues that would be useful for the development of an alternative understanding. There can be a fine line between explaining one’s understanding of a patient, and spinning that patient to justify one’s actions or the proposed disposition plan.

5.4 Discussion

I have shown that admission handoffs are negotiations. In so doing, this work joins a small body of research (Hartswood et al., 2003; Nugus et al., 2009) that has begun to demonstrate the central role of selling and negotiating to the placement of patients within healthcare systems. ED physicians engage in selling, attempting to convince inpatient physicians to accept admissions, while inpatient physicians push back against such selling, suggesting alternative understandings of patients or different approaches to care. Admission handoffs are between-unit transfers that involve coordination across organizational and specialization boundaries in the care of patients who are typically at early points in the trajectories of new illness episodes. Patient uncertainties, workload management concerns, and physician characteristics become entangled, producing

ambiguities that complicate communication and coordination. Parties involved cannot be certain whether the actions of their handoff partners are motivated by necessary workload management or by work avoidance. When handoff parties disagree about the patient and the appropriate approach to care, it can be difficult to know if the other's understanding emerges from expert insight or insufficient experience.

The nature and outcomes of admission handoff interactions are partly influenced by the processes in place. At Memorial Hospital, the ED physician must first make a decision to admit the patient and then make another decision about where to place the patient. Then the ED physician must present the patient in a handoff. The order of these activities is significant. Because the ED physician must make disposition decisions first, without input from the Internal Medicine services, the ED physician is ultimately put into the position of needing to defend these decisions during the handoff. The study site hospital does have an Internal Medicine-trained triage resident located in the ED who provides consulting on placement of patients on Internal Medicine services, but this resident's decisions are not binding. In short, the processes in place require the ED physician to commit to a disposition decision and then defend it. Selling then can be seen as a defensive tactic. With patients whose cases are particularly complex or whose diagnoses are elusive, the challenge lies in handling ambiguity and uncertainty. The more ambiguity and uncertainty are acknowledged in the presentation of the patient's case, the more difficult it may be to construct a coherent understanding of the patient and the more likely it may be that the receiving physician will construct an alternative understanding of the patient and push back against the proposed disposition plan.

When the norms surrounding handoff include the expectation that ED physicians must justify decisions they have already made, a social dynamic emerges that incentivizes skillfully crafted narratives that favor certainty and closure rather than acknowledging

ambiguity and allowing openness. This sets up potentially confrontational negotiation contexts (Fisher & Ury, 1981) that may have negative effects on the organization's ability to make sense of its situations and to respond most appropriately (Weick, 1995). The admission handoff then runs the risk of becoming a defense of a decision rather than a meeting of minds, where the varying expertise and perspectives of different specializations are brought to bear on the case. An important opportunity for ensuring safety and quality may be lost.

Policies also contribute to these dynamics. At Memorial Hospital the Emergency Department has the right to admit patients, but it does not have the final say in the placement of those patients. The surgical services have the right to refuse any admissions, while the General Medicine service has no such right. The Internal Medicine sub-specialty services may refuse admissions under certain circumstances but not under others. The complexity of these policies and the uneven distribution of power these policies afford the various services prevents admitting and placement from being straightforward in the cases of many patients. Negotiating therefore becomes necessary.

5.4.1 Implications

The characterization of admission handoff as situated interaction in which entangled ambiguities are negotiated produces some implications for practice improvement. In this section I highlight four general implications and then provide several examples of possible recommendations.

First, hospitals must acknowledge that admission handoffs—and likely other kinds of between-unit handoffs—are negotiations, and negotiations can have significant consequences for organizational orders (Strauss, 1978; Strauss et al., 1963). Therefore, efforts to improve such transitions must move beyond simplistic information transmission models of handoff. Negotiations necessarily entail interaction between two (or more)

parties who hold differing opinions, perspectives, goals, or other concerns. These interactions are aimed at working through these differences, if not to reach complete agreement, at least to reach some arrangement that will avoid stalemate and allow work to proceed. This interaction interferes with simple one-way transmission of information as the party on the receiving end takes an active role in exploring or arguing for alternative understandings of patients and approaches to care and work. Improvement efforts are needed that recognize handoff as a dynamic interaction, characterized by ambiguity, in which involved parties must balance multiple concerns.

Second, hospitals should try to reduce ambiguities where they can—without sacrificing necessary flexibility. Any institution wishing to improve its admission handoffs would be advised to examine how its current policies and processes set up particular kinds of dynamics. Improvements may be obtained not only by intervening at the level of the handoff itself, but also by altering larger policies and processes.

Third, hospitals should acknowledge that the removal of all ambiguity is not the goal. Rigid policies and processes may produce more harm than benefit. Because handoff negotiations sometimes emerge from alternative perspectives on the patient's case and careful rethinking of approaches to care, these negotiations can serve important safety and quality functions for the hospital. Thus, removing all disputes or negotiations is surely not the most appropriate goal. Instead, hospital leadership will want to structure policies, processes and culture to facilitate interactions that capitalize on the collaborative potentialities of handoff.

Fourth, hospitals must actively foster positive relationships among the services and across the various specializations. Otherwise, the divisions of labor that increasingly characterize medicine today will threaten patient-centered care. Understanding the work processes of other units appears to help physicians appreciate the perspectives and

concerns of their handoff partners. Likewise, personal positive relationships between two physicians seem to foster cooperative interactions. Activities that enable staff from one unit to interact with and learn more about the work of staff in another unit may serve to improve the quality of between-unit transfers.

The specific improvement approaches taken will necessarily need to be shaped to suit the unique context and needs of the individual institution. With that caveat in mind, I present some initial recommendations meant to be taken as examples of possible avenues to improvement.

Clarifying policies. Hospitals might quickly survey staff to identify one or more frequently-occurring problem area and convene a task force to work on improvement. For example, at Memorial Hospital, shortly after I completed my observations, doctors in administrative positions in Surgery, the ED and General Medicine identified patients with abdominal pain as a kind of ED patient around which disputes over placement frequently arise. The task force gathered data on actual placement patterns of such patients, developed more explicit placement protocols outlining when the patient should go to surgery and when to a medicine service, and then presented these findings and changes at a Grand Rounds. Addressing one or two frequently-occurring problem areas may be a fairly quick way to improve a large number of handoffs.

Ambiguities may also be reduced by making explicit who has the authority to admit and make placement decisions, or by centralizing such authority, or by stipulating how disagreements are to be arbitrated. For instance, a policy might state that when there is a disagreement over disposition, the parties should report to the ED and conduct the negotiation in person. Research shows that “distance matters”, and telephones constrain the quality of interaction relative to face-to-face encounters (Olson & Olson, 2000). By conducting such negotiations when co-present, parties can make use of multiple

communication channels and become better acquainted, potentially building more rapport across hospital units.

Changing processes. One aspect of the admission process at Memorial that sets up a problematic dynamic is the sequence of steps. ED physicians must make a decision and select a service for admission and make these decisions essentially binding in the hospital's information systems *before* talking with the Internal Medicine physicians. Processes could be altered to force interactions between the services before any party takes a stand on admission or placement. Then, decisions can be made by an empowered party *after* the varying perspectives on the case are heard. This might be accomplished in a number of ways.

Experienced Internal Medicine physicians could rotate through the ED to help with triage and consult on disposition. Currently, Memorial Hospital uses a second year Internal Medicine resident for this purpose. However, although this experience is valuable for the resident; it is less useful for negotiations. The Internal Medicine's recommendations are not binding, and several ED and General Medicine physicians suggested to me that second year residents lack sufficient experience for the task.

Information technology solutions may be useful for alerting inpatient physicians sooner to possible admissions and starting conversations between them and the ED. For example, when the ED physician submits the initial admission request in MedRec, a message could automatically be sent to the inpatient physician handling admissions for that service. The inpatient physician could then begin his or her chart biopsy earlier in the process, potentially raising concerns sooner.

Enhancing practice. Negotiating is a learned skill, and some ways of negotiating produce more satisfactory results for all parties than do others (Fisher & Ury, 1981). Medical schools and hospitals could provide training in methods of negotiation that stress

cooperation and mutual benefit. Surely such skills would have far-reaching application as admission handoff is not the only activity that involves negotiation.

The practice of residents rotating through various services of the hospital increases the residents' knowledge and awareness of the unique needs and constraints of those services. Since understanding the interests of others is important for mutually-beneficial negotiations (Fisher & Ury, 1981; Strauss, 1978), perhaps the spirit of rotations could be replicated in new practices for attendings to reduce the tendency that they become siloed in their own services. Attendings might periodically round on other services or spend a day in a different unit. Simple practices such as these might help to break down any us-them mentality. As medicine becomes increasingly specialized, new practices will be needed to foster understanding, appreciation, and positive relationships across divisions of labor.

While hospitals may take certain actions to reduce the ambiguities of admission handoffs, some amount of ambiguity is likely to remain. For the foreseeable future, there will continue to be uncertainties surrounding the illnesses and future trajectories of various patients, potentially giving rise to differing opinions and perspectives that will need to be negotiated. As long as hospitals operate at or near capacity, and the care of individual patients must be balanced with the care of entire units of patients as well as with unknowable future patients, there will be workload management concerns to negotiate. Finally, the highly specialized, increasingly technical nature of medicine means that there will always be a wide variety of expertise, experience, and competence among clinicians. Thus, some amount of ambiguity will remain as parties attempt to discern to what extent such variations are responsible for the actions of their handoff partners.

5.5 Conclusion

I have identified and described the practices of selling and pushing back and characterized admission handoffs as negotiations. Furthermore, I have shown that these

negotiations are situated interactions that unfold in a multi-dimensional space involving entangled ambiguities. These ambiguities naturally emerge from patient uncertainties, workload management concerns, and physician characteristics, but they are compounded by the negotiations of admission handoff interactions. The communications of admission handoffs are not simple information exchanges. Rather, many statements made have multiple potential meanings, emerging from a number of different motivations. The parties involved in admission handoffs must interpret such statements dynamically and in context. Hospitals may be able to reduce ambiguities, and thereby improve handoffs, but some amount of ambiguity is likely inevitable. Processes that acknowledge the situated, interpretive nature of admission handoff and equip parties to engage in meaningful interaction should produce better handoffs than processes that treat handoff primarily as an information transmission activity.

Chapter 6

Re-enacting Boundaries: Handoffs and Divisions of Labor

Good fences make good neighbors.
[...]
Something there is that doesn't love a wall / That wants it down.
—Robert Frost, *Mending Wall*

6.1 Introduction

Any study of between-unit handoffs necessarily involves the examination of coordination across organizational divisions of labor. Where there are divisions of labor, there are boundaries that separate groups of organizational actors. In an effort to further understand the complexities and challenges of admission handoffs, to enrich our understanding of the relationship between practice variety and organizational structure, and to deepen our insight into the role that organizational structure plays in handoff interactions, I examine the divisions of labor between hospital units as they figure into admission handoff practices at Memorial Hospital. This chapter, then, is focused on my final research question: *How do organizational boundaries figure in the interactions of admission handoff?*

Two of the more influential concepts related to boundaries are boundary work and boundary objects. As Riesch (2010) points out, the two concepts reveal different views of boundaries. Gieryn (1983) developed the concept of boundary work to explain the efforts of scientists to establish the epistemic authority and legitimacy of their knowledge vis-à-vis non-scientific activities or products. From this perspective, then, boundaries are about

insider/outsider dynamics. They are instruments of hegemony—efforts to control, marginalize, and exclude. Studies of boundary work in other domains have revealed a similar perspective on boundaries (Allen, 1997, 2002; Lamont & Molnar, 2002; Mizrachi et al., 2005).

Star and colleagues (Bowker & Star, 1999; Star & Griesemer, 1989) develop the concept of boundary objects to describe the artifacts, material or symbolic, that are shared between social worlds that must interact. From this perspective, boundaries are the interfaces for communication (Bowker & Star, 1999) and not necessarily inherently about control or domination. The central challenge is to find ways of working together across boundaries. The rules encoded in standards embodied in boundary objects are not merely the imposition of one group's world view upon another, but rather are the anchors and bridges that, perhaps only temporarily, connect disparate worlds. Elsewhere, boundary objects have been shown to mediate relationships and define boundaries in manufacturing settings as well (Bechky, 2003).

Others who have studied boundary work in healthcare settings have tended to focus on the divisions of labor that separate different health occupations (Allen, 1997, 2002; Barley, 1986; Mizrachi et al., 2005; Strauss et al., 1997; Strauss et al., 1963). For example, Allen's (1997, 2002) work examines the policing of boundaries between nurses and doctors during a time of crucial policy changes in the UK. Allen shows how nurse managers, through their day-to-day activities, negotiated work identities and occupational boundaries as the divisions of labor shifted to accommodate reductions in resident work hours and other policy changes. Mizrachi and colleagues (2005) analyze the processes of boundary demarcation by which the dominant biomedical profession in one university-affiliated hospital avoided overt confrontation with, yet maintained its authority and domination over, alternative medicine practitioners when both professions shared the same

institutional space. Barley's (1986) work examines the changes in role relations among occupational groups following the introduction of new CT scanners in two radiology departments. Barley finds that identical technologies can occasion similar dynamics and yet produce different organizational structures in the form of different divisions of labor. Thus, it was not the technology itself, but the social context and patterns of interaction in which the technology was embedded that shaped the use and outcomes.

Many of these studies of boundaries (Allen et al., 2004; Barley, 1986; Bechky, 2003; Mizrachi et al., 2005; Strauss et al., 1963) emphasize the importance of day-to-day interactions and informal negotiations in addition to any formal efforts to define and maintain boundaries. Weick (1979) has encouraged us to give more attention to verbs, to theorize the actions of organizing rather than merely the properties of organizations. Rather than taking structure as static, received reality, a practice theory lens (Feldman & Orlikowski, 2011) focuses on the dynamic, contextually-embedded actions and processes by which organizational actors enact their realities (Orlikowski, 2000; Weick, 1979, 1995). Social structure and the agency of actors are mutually constitutive: structure enables and constrains action, while actions produce, reproduce or alter structure (Giddens, 1984). I have taken a similar view of structure and agency in the analysis that follows, examining how boundaries between medical specializations and hospital units are reproduced in the recurring patterns of actions of physicians.

In his classic poem *Mending Fences*, the American poet Robert Frost tells of two neighbors, the narrator and the owner of the adjacent farm, who work side by side in their annual ritual to repair the stone wall that divides their properties. The poem illustrates several points that are useful for my analysis. First, the two quotes at the beginning of this chapter—one from each character—reveal different perspectives on walls and boundaries. The farmer-neighbor twice announces, in explanation for why the ritual should go on year

after year despite the lack of any practical need for the wall: “Good fences make good neighbors.” The message is that clearly demarcated boundaries reduce conflict and confusion. But the narrator, noting that year after year the wall is disturbed by heaving frosts and careless hunters, concludes, “Something there is that doesn't love a wall / That wants it down.” Boundaries can be obstacles that stand in the way of ongoing processes (e.g., the freezing and thawing of the earth) and the goals pursued by certain actors (e.g., hunters chasing rabbits). In studying the role of boundaries in organizations, there is potential value in retaining a complex view of such divisions, in not settling on a view of them as inherently good or bad.

The Frost poem also speaks of the ongoing work to maintain the wall. By various means, the wall is shifted and changed over time, and its keepers must attend to it with some regularity. The recurring, ongoing nature of boundary work hinted at in the poem is a theme that is central to the analysis I present below.

Given the growing complexity and diversity of needs of the patient populations served by tertiary referral hospitals (Bodenheimer et al., 2009), there is an increasing need for highly specialized services. Thus, the divisions of labor that result from specialization may be seen as efforts to meet the law of requisite variety, which holds that systems that regulate highly variable inputs from a complex environment must have a corresponding complexity and variety (Conant & Ashby, 1970; Weick, 1979). However, along with increase in divisions of labor comes the corresponding increase in coordination costs (Becker & Murphy, 1992). This tension between divisions of labor and coordination costs is integral to the boundary work I describe below.

The chapter is organized in three sections. In the first section, I explore the disagreements over understandings of patients that characterize some admission handoffs, showing how these disagreements reveal conflicting presumptions about boundaries. In the

second section, I examine how the actions of physicians may be interpreted as active maintenance of boundaries and suggest how boundaries may change over time. The third section provides a discussion of these matters and implications for theory and practice.

6.2 Presuming Boundaries

In this section I explore the disagreements that arise over the dispositioning of patients as a way of beginning to identify how organizational structures, in particular divisions of labor, influence and are also influenced by the negotiations of admission handoffs. Drawing on the framework of sensemaking (Weick, 1979, 1995), I show that physicians presume the boundaries that divide hospital units and take actions that re-enact those boundaries. The disagreements that characterize some admission handoffs may be seen as conflicts between presumed boundaries.

Most physicians I spoke with asserted that the goal, with respect to dispositioning patients, is to do what is best for the patient. Indeed, an argument I frequently heard for changing the disposition plan was that the patient would be “better served” by some other plan. Sometimes there is consensus among the involved parties about what is best for the patient but not always. The different experiences and specializations of different clinicians contribute to differing ideas about what is best for a particular patient. These differences can give rise to disagreements that can stall or otherwise prolong the admission process, complicate handoff, and necessitate negotiation.

Ostensibly, the disagreements that emerge during admission handoffs stem from different understandings of the patient. Indeed, given the uncertainties that surround many ED patients, it is not surprising that the involved parties might develop different understandings that would need to be reconciled, at least to some extent. However, I argue that efforts to define or frame the patient are entwined with efforts to re-enact presumed boundaries between the hospital’s units, or between specializations. As we will see, the

boundaries between various units or specializations are not as rigid and sharply defined as we might expect. In the cases of many patients, this poses no problem. However, the cases of those patients whose conditions fall somewhere on or near the boundaries of two or more specializations reveal the ongoing work entailed in accomplishing divisions of labor.

There are at least two broad topics of such disagreements: those which concern the patient's level of acuity, and those which concern identifying the "main" problem in the cases of patients with comorbidities. At times these topics are overlapping or interrelated. Nevertheless, making a distinction between them is useful for analytical purposes.

6.2.1 Disagreements over level of acuity

Highly specialized hospitals, such as Memorial Hospital, include a variety of different services that are positioned to offer different types and levels of care. Some of these services, such as critical care units, are in place to serve the needs of highly acute illnesses occurring in unstable patients who require close or constant supervision by specially trained clinicians. Other services, such as Surgery or Cardiology, are positioned to perform specialized procedures or to oversee very particular, serious illnesses or both. Finally, there is General Internal Medicine, which is intended to treat a variety of common illnesses occurring in patients who are in stable condition. Disposition plans, therefore, require that a determination be made regarding the acuity of the patient. In more common language, physicians must decide how "sick" the patient is.

Disagreements can arise over the relative sickness of the patient and produce the need for negotiation. These disagreements can arise over either aspect of the disposition plan: the decision to admit or the decision to place the patient on a particular service. In the first category, ED physicians may think a patient is sick enough to warrant admission while the inpatient physician thinks the patient could be sent home and cared for in an outpatient setting. In the second category, there may be no dispute over the need to hospitalize the

patient, but there will be disagreement over whether the patient is sick enough to warrant specialized versus general care or whether the patient is well enough to undergo surgery or not.

Pushback that is constructed based on acuity will take one of two forms: arguing that the patient is too sick for a proposed disposition plan, or arguing the patient is not sick enough. I explore each of these forms in turn.

6.2.1.1 Too Sick

When physicians on the receiving end of an admission handoff push back, they sometimes do so by arguing that the patient's acuity is too high for their service. For example, more than once I heard General Medicine physicians state that a patient was "too sick for the floor" and should be sent to a critical care unit instead. In the following handoff excerpt a hospitalist pushes back against the placement on his service of an ED patient who is currently receiving a particular IV medication in an amount that would indicate the patient may be unstable and that requires fairly constant supervision.

Hospitalist: Okay, over how much time did he get all his Ativan?

ED Resident: This is over, he arrived a little after 11:00 I believe, so this is over three, three hours.

Hospitalist: Okay because the issue with that is that's not a floor level amount of Ativan that he can be receiving

ED Resident: Okay.

Hospitalist: Because if you translate that out, that's going to be like 100mgs of Ativan in a day.

ED Resident: Yes.

Hospitalist: So—

ED Resident: But it should, it will question a [critical care] unit consult?

Hospitalist : Yeah, unfortunately you kind of need to have him [seen by a critical care resident] because if he really needs that much [Ativan], he'll probably need a drip—

ED Resident: Okay.

Hospitalist: —then go to the [critical care] unit. (H01; P101, hospitalist; P220, ED resident)

This particular handoff conversation ended by postponing the admission until after a critical care unit physician could examine the patient and determine whether the patient

should go to the ICU or whether the amount of the medication should be decreased to a level appropriate for the floor. This excerpt illustrates a few important points. First, because variations in terms of the specialized knowledge and resources available from one service to the next, patients requiring certain kinds of care simply cannot be cared for on certain services. In this handoff, the patient was receiving a dosing regimen of the drug Ativan²⁸ that would require action on the part of a nurse almost hourly. As the hospitalist explained to me later, there are not sufficient nursing resources to provide that level of care on a General Medicine floor. Hence, in disputing the disposition plan of a single patient, the hospitalist is also re-enacting a presumed boundary of his service based on the kind of care it is equipped to provide. Second, to assess the disposition plan, the hospitalist must call upon not only his knowledge of diseases and therapies, but also his knowledge of the functioning and resources of the hospital. A central challenge of placement is to match the needs to the patient with the resources and capabilities of the hospital's services. Third, handoff conversations do not always end with a transfer of responsibility for the patient. Sometimes the admission is stalled as a result of a handoff conversation so that additional diagnostic work, consultations, or other conversations can be undertaken to settle disagreements or to convince the involved parties of the appropriateness of an alternative disposition plan.

When General Medicine physicians push back against admissions that they feel belong in a critical care unit or in surgery, it is not uncommon for them to say they are not “comfortable” taking the patient onto their service. This word expresses a sense of uneasiness with respect to the possibility of something happening acutely for the worse to the patient—something they do not feel properly equipped to handle or at least not as well positioned to handle as some other service. This feeling of being uncomfortable emerges

²⁸ Ativan is an anti-anxiety drug used to sedate patients

from concerns about a potential mismatch between the needs of the patient and the capabilities of the service on which the patient is being placed. The more uncertainty there is regarding a patient's condition—as when patients are ambiguously diagnosed, are borderline stable, or have multiple morbidities that make management of their illness particularly complicated—the more likely a General Medicine physician will feel uncomfortable accepting the admission.

Often this uncertainty is expressed in concerns that the patient will “suddenly decompensate,” requiring immediate specialized care that the service is not positioned well to provide. Decompensating relates to a failure of a bodily system. Other similar terms physicians use include “crashing” and “crumpling.” The concern is that some aspect of the patient's condition is unstable and may change suddenly, threatening the safety of the patient. In one example, an elderly patient with multiple surgical and medical problems was refusing to consent to surgery. While the ED, surgery and medicine physicians involved in the case all agreed that the most pressing problem was a newly-discovered mass in her brain, the unwillingness of the patient to consent to surgery made the surgical attending unwilling to accept the patient onto his service. The hospitalist who was then to take the patient objected strongly, arguing that the patient might “acutely decompensate” during the night, specifically that the patient's brain might hemorrhage. While General Medicine physicians are trained to respond in emergencies, there would nevertheless be some delay getting the patient to those who could operate or otherwise address the problem. In this particular instance, the hospitalist was successful in persuading the attending on the Neurology surgical service to take the patient. Thus, the re-enactment of boundaries is contingent, to some extent, upon the willingness of parties to engage in negotiations about placement. Had the hospitalist not aggressively argued for changing the disposition plan, the patient would have been placed in General Medicine.

Different units of the hospital have different kinds of expertise on hand, different patient-to-staff ratios, different medical equipment available, and hence, are differently positioned to respond to different scenarios. In arguing whether or not a given service is prepared to handle the potential decompensation of a particular patient, the physician is also arguing about the limits of that service's capabilities, and thus, where a boundary is presumed to lie. Boundary negotiations, then, can be seen as efforts to pressure-test disposition plans, to ensure safe, high quality care is being provided.

If concerns about decompensating motivate some General Medicine physicians to push back against certain admissions, the counter-move by surgeons and intensivists is to allay these concerns. This is done by arguing that there is little likelihood that the patient will decompensate and by reassuring the General Medicine physician that appropriate surgical or critical care expertise will be readily available if needed, as one ED attending explained to me.

They make the argument, "We're telling you if there's a problem we'll be right on it. If there should be a problem in the middle of the night, we'll be there for you, and we can follow it while the patient is in the hospital on your service. If that makes you feel better, we'll do that too." You can't mount much of an argument for "No, but you still need to take the patient." It's like, no, they're basically providing you the service should you need it if something goes wrong. (P210, ED attending)

The discomfort General Medicine physicians express regarding caring for patients whom they feel may suddenly decompensate stems in part from a perception of the boundaries as obstacles. The concern is that precious time may be lost in communicating and responding across boundaries, and the patient may suffer as a result. In the quote above, the ED attending conveys the common response made by surgeons and intensivists which is effectively to downplay the significance of boundaries, to suggest they can be easily crossed when necessary.

A resident on the General Surgery service explained that, from his view, many of the concerns about patients suddenly decompensating are based in a

... misunderstanding [by Internal Medicine physicians] of the disease process. Now it's a highly, I mean brain tumors, or any tumors for that matter, that may invariably cause either swelling obstructions or other down the line process, they [General Medicine physicians] don't have a clear understanding on what the time line, on what the process is because they're not used to it. [...] So if that's the case, if that's the type of expertise that they're requiring because they're uncomfortable that this patient may, you know, degenerate, either you communicate with them, that process won't happen: it's a slow growing tumor, you know, she may not herniate over night. You know what I'm saying? So you have to communicate and sort of reassure that we'll be around if that happens, but you know, I think it's best that this patient be served, you know, be observed on Medicine because of these other outlying issues and brain tumor not being the single solitary one. (P402, Surgery resident)

This surgeon argues that many fears that General Medicine physicians have about potential decompensation emerge from a lack of knowledge about the normal trajectory of certain diseases. In other words the disagreements of admission handoffs are not merely disagreements about individual patients, but may also involve more fundamental disagreements about illnesses and common trajectories.

General Medicine physicians are not the only ones who argue that a patient is too sick for the proposed disposition plan. Surgeons sometimes argue that a patient is “too medically unwell” for surgery and would be better cared for by an Internal Medicine team.

Well some contention tends to arise when there are other issues about the patient that make them unsuitable for an operation. For example if a patient comes in with evidence of gall stones and pain in the right side of the abdomen that looks like it is caused by the gall stones but this patient also has a bad heart and uses oxygen at home, is two and a half pack cigarette smoker and recently had a heart attack, that patient isn't a good surgical candidate. One would argue you shouldn't operate on that patient because all you do is increase the risk that that patient will die. So there are other ways that those gall stones and symptoms can be treated without an operation. And that patient even though they come in with a surgical problem, has co-morbidities of a medical nature that are better managed by the Medicine team. (P401, Surgery resident)

Acuity concerns are intertwined with the complicatedness of patients who have multiple morbidities. Interventions to treat illnesses put stress on the body. This stress, in turn, may produce negative consequences for other illnesses. For instance, surgery to remove gall stones can negatively impact existing heart problems. These concerns start to drift into a separate kind of disagreement I discuss below: disagreements over which illness

is the main problem. Nevertheless, the argument made above and in some other situations is that the patient is too sick for surgery.

6.2.1.2 *Not Sick Enough*

Pushback based in disagreements about acuity level can also use the argument that a patient is not sufficiently sick to warrant the proposed disposition. These disagreements can focus on the admission decision or the placement decision. The boundary negotiations that emerge in these situations may be evidence of physicians pressure-testing disposition plans to ensure efficient use of resources.

General Medicine physicians sometimes push back against admitting patients whom they believe could be safely cared for in an outpatient setting. These are often borderline cases where lab values or radiographic test results do not provide conclusive evidence of a serious problem. These are also often cases where ED physicians may sell based on their gestalt—their intuitive, holistic sense of the patient—rather than on clinical evidence or where the tactic of being honest may be employed. Both of these approaches were discussed in the previous chapter. General Medicine physicians I talked with occasionally work or have worked in outpatient clinics. Rarely do ED physicians work in such settings. As a result, General Medicine physicians sometimes argue that ED physicians are not aware of the extent of care that is available in outpatient clinics.

Over time, as patients in the US health system become more complex, as medications and other therapies improve, and as payers become more restrictive about reimbursement for hospitalization costs, the concept of what can be handled in an outpatient setting and what requires hospitalization changes. One ED attending explains:

I had a young woman last week who had a peri-rectal abscess. So she had an abscess right next to the rectum. She has a parent—she was like 20 or 21—she has a parent and a significant other, but both of them work. Both of them are like, (raising her voice and simulating an anxious, frightened reaction) “I can’t do this, oh my gosh!” So I think 15 years ago she probably would have been admitted for packing changes

and at least 24 hours until we sorted it out. Well she didn't get admitted. It was like 'here are the 5 different options you have – you can talk to mom, you can talk to dad, you can talk to this, you can talk to that, we'll get a visiting nurse.' And then it's insurance issues or whatever, but she went home. Whereas 15, 20 years ago she would have been admitted to the hospital...and we would have taken care of it for her. We would have figured something out. And so there is an expectation on the part of the health care system, on the part of society, that you will manage things on your own that you used to not have to manage on your own. People go home with these very complicated dressing changes and wound packs and all this stuff that years ago it was: 'Come on in, hang out with us.' So that's what I mean. You need to *need* our services and things that only we can do to come in to the hospital. And I think that that will become even more evident as time goes on and as [observation units] become more standard. (P204, ED attending)

This experienced attending observes how patterns of admissions have changed over time in some respects—how the boundary between what constituted 'sick enough to be admitted' and 'not sick enough to be admitted' has shifted. It is likely that a number of factors have contributed to these changes, including exogenous forces, but it is also possible that the daily negotiations of admission handoffs have played a part in reshaping this particular boundary over time. While some boundary changes may happen suddenly through policy initiatives, other changes will happen more subtly, through gradual slipping as physicians negotiate boundaries in handoff.

Some disagreements over acuity involve a critical care intensivist or an internal medicine sub-specialist arguing that the patient is not sick enough to demand their specialized services. The disagreement then regards not the decision to admit the patient, but rather the decision to place the patient on a particular service. For example, heart failure is a somewhat common problem for which patients are admitted. But all instances of heart failure are not equally serious or acute, and General Medicine physicians can care for those cases that are less acute. Cardiologists may resist having certain heart failure patients placed on their service, preferring to reserve the spaces on their service for patients with the most serious heart conditions. One hospitalist explained.

There are a few patients who have sub specialty care needs. So if you are a patient with heart failure and you have sort of mild or moderate heart failure and you're

coming in with worsening of that, I'll take care of you. If you're a patient with severe heart failure and you're listed for a heart transplant and, you know, your heart function is a few percent of normal, then you'll probably be best served on a cardiology service with those, actually not even the general cardiologist but the heart failure specialists. [...] If you're having a—we call them ST elevation MI—but if you're having a serious heart attack instead of a nice quiet heart attack, then you go the Cardiology Service. (P105, hospitalist)

As this hospitalist explains it, the distinction between the more serious and less serious heart conditions seem fairly clear, and in some cases it may be. As another hospitalist put it, placement policies provide a “general rule of thumb, but the devil's always in the details.” With borderline patients—patients whose conditions lie somewhere between the more serious and less serious—debates can emerge and reveal the overlap of the hospital's divisions of labor and the permeability of boundaries. In theory we can speak of “more serious” heart conditions and “less serious” heart conditions. In reality, however, patients do not always fall into neatly discrete categories. Furthermore, physicians sometimes argue that many of these borderline patients can be safely cared for on either the General Medicine or sub-specialty service, which suggests that the borders between the units are not lines, but overlapping spaces.

Negotiating the placement of patients whose cases fall in those overlapping spaces is further complicated by the fact that a placement decision often involves more than merely addressing the needs of the individual patient. Doctors must also consider larger workload management issues, including the needs of entire units of patients and of potential future patients and the availability of beds. If the sub-specialty service is at or near capacity and the General Medicine services are not, the sub-specialty physician can often make a strong case for sending the patient to the General Medicine service. When the situation is somewhat reversed and the General Medicine service has been “slammed” with multiple consecutive admissions, the General Medicine physician may be in a stronger negotiating position. The negotiations of admission handoffs, then, are influenced by concerns beyond

those pertaining to individual patients, and the abilities of physicians to negotiate will be enabled or constrained to varying degrees by the availability and distribution of hospital resources.

6.2.2 Disagreements Over Main Problem

Complicated patients—those with multiple morbidities, particularly where treatment of one illness may create complications for treatment of another—are common at Memorial Hospital. Disagreements about where such patients should be placed when admitted may be partly understood as disagreements over which illness is the main illness or the most serious one. A rationale expressed is that a patient should be placed on a service where clinicians specialize in or are otherwise positioned to give primary attention to managing the patient’s main illness. However, establishing the main problem is at times difficult. I organize my discussion of such disagreements around two topics: the division of illnesses into medical problems and surgical problems, and the coordination of care for multiple problems.

6.2.2.1 *Surgical Versus Medical Problems*

Doctors are roughly divided into two groups based on the approaches they take to the treatment of illness. Surgeons perform operations. Internal medicine physicians treat using pharmaceuticals and therapies. Consequently, the distinction between medicine and surgery has led to a parallel distinction between “surgical problems” and “medical problems.” That is, illness conditions must be categorized into those that surgeons address and those which internal medicine physicians address. The categorizing of illness conditions into these two groups is not solely a function of the properties of the illnesses themselves but is also a function of the divisions of labor that have resulted from the advancements of medical and surgical practices.

Frequently patients come to the ED because of a surgical problem, that is, one that might normally be operated on. However, surgeons may refuse to admit such patients out of concern that their medical problems would complicate or be complicated by surgical interventions, as one hospitalist explained.

...there are patients who have a whole lot of medical issues who may also have some surgical thing. So, maybe the patient with the hip fracture is also you know, a little bit older, and they've got kidney failure, and they're on dialysis, and they've got heart disease, and they've got several other things where there are just a lot of details to take care of that don't have anything to do with the surgery proper, and in that case it's, you know, more typical that the Internal Medicine people would be the primary team. The surgeons will consult. And partly, partly that's a matter of interest and experience. I, you know, there are a lot of surgeons for example who haven't thought about managing peoples' blood pressure since they were in medical school, and likewise, there are a lot of us internists who, when you tell me the anatomic name of some structure in the abdomen, I couldn't really tell you where that is, and so we have our different experience and that all, and it mostly works. (P105, hospitalist)

The hospitalist describes a generic situation in which a patient with both surgical and medical problems gets admitted to a medicine service. As a justification, he points to the fact that surgeons may not have sufficient recent experience managing the various medical comorbidities. Knowledge and expertise, then, are sometimes used to delimit specializations and define boundaries.

But some physicians express different opinions about the appropriateness of placing the primary management of a patient on the internal medicine physician when the problem that brought the patient to the hospital is a surgical one. One ED resident told me about an elderly female patient with recurring nose-bleeds whom the ENT (Ear, Nose and Throat) surgical service refused to admit. The ENT admitting physician argued that because the patient had high blood pressure, she was not fit for surgery. The ED resident expressed her dissatisfaction with this argument when I interviewed her.

I mean [the patient is] old, and she has afib [atrial fibrillation], and she had been on Coumadin, and her blood pressure was a little bit high. It wasn't ridiculous. It was a little bit high, which wasn't helping her nose bleed either. So, it was actually all playing into the same problem, and like, they're doctors. A little bit of high blood

pressure? I think you can handle it. And the other thing is, too, is they [surgeons] have the option that if someone's on their service, and they feel like they have too many medical problems, they [surgeons] can consult medicine and get medicine's input. So, it can work both ways. (P212, ED resident)

Unlike the previous quote, this resident downplays any difficulty surgeons would have managing a medical problem. She stresses the simplicity of the medical problem (i.e., "A little bit of high blood pressure?") and shared basic medical training of all MDs (i.e., "they're doctors"). In so doing, she is effectively arguing that a boundary of competence or knowledge does not exist where the surgeon claimed it to be.

The resident also notes that medicine physicians can consult on patients who have been admitted to a surgical service. Elsewhere in this interview, however, the resident said,

I feel like these surgical services just dump onto General Medicine. Like, they don't want to take care of anyone unless you're twenty and completely healthy and then you only have one ENT problem, then maybe they'll admit you. (P212, ED resident)

During one observation, while talking with two hospitalists, I was told that surgeons at Memorial Hospital take a "conservative definition of 'surgical patient'—only accepting patients when they plan to use the knife on the patient." These two hospitalists claimed that at other hospitals surgeons were more likely to take patients with surgical problems even when they did not intend to perform surgery because of medical problems that might be complicated by surgery. Others I talked with also suggested that patterns of admissions regarding surgical patients differ at other institutions. One ED attending, who also felt that surgeons at Memorial Hospital were reluctant to accept patients onto their service unless they planned to operate, contrasted this with a non-teaching hospital where he had previously worked. There, he told me, "You'd practically see the surgeons themselves pushing the patient down the hall to surgery." These observations suggest that while there may be some common aspects of the boundaries between specializations more generally, some aspects may be institutionally-dependent.

The perception that surgeons at Memorial Hospital are unwilling to take many cases was expressed to me by many physicians in both the ED and General Medicine; however, in some cases, actual experience contradicts this perception. One ED resident who described the surgical services as “pretty selective in who [sic] they take onto their service,” went on to tell me, “I think with surgery, more often than not, I’m surprised. I mean, I think that they won’t take [the patient], and then they do.” Learning where boundaries between services are presumed to lie is an ongoing process. In part, this may be evidence that the boundaries are not fixed, but shifting and depend to some extent on the actions of the individuals who are maintaining them—a topic I take up in a later section of this chapter.

When surgeons pushed back, often by overtly blocking an admission, they often did so by arguing that one or more of the patient’s medical problems was the main problem, or the more serious problem, or the one that had to be dealt with before surgery could be safely undertaken. In the following interview excerpt, a surgery resident provided an example. Although the resident uses the term “more acute” to describe the patient’s medical problem, the essence of the pushback rationale is that the patient’s heart problem (the medical problem) is more serious and requires more attention than does the surgical problem.

I mean the level of care that’s provided here is different from what you see I think out in the community, and so not infrequently, we have patients who have had a heart transplant and a surgical problem. You know, there’s a question, who do they go to? Not uncommonly we’ll, even if they have a surgical problem, ask that the cardiac team take the patient because more acute is managing the patient’s heart. And so sometimes there’s a joint effort in trying to delegate who’s responsible for that patient. In the end I think anybody who’s taking care of that patient in any level is responsible for them. So you work together to do what’s best for the patient.
(P403, Surgery resident)

In essence, the argument made in this case is that the patient’s heart condition is more critical than his or her surgical need. I witnessed this general scenario play out numerous times. A patient in the ED had an issue that, all other things being equal, surgery would

normally operate on. However, after consulting in the ED, surgery declined to take the patient, advising that the patient should go to a Medicine service. Often, in the subsequent handoff to Medicine, the receiving physician would push back, arguing that the issue that brought the patient to the hospital is the surgical issue, and therefore, the patient should go to surgery. However, since at Memorial Hospital Surgery has the right of refusal, and the General Medicine services do not, the General Medicine physician cannot force Surgery to take the patient. Some General Medicine physicians will on occasion call the Surgery admitting resident and have further discussion to attempt to convince them that the patient should go to Surgery. Sometimes, this approach is successful. Sometimes it is not. Regardless, as one ED attending observed about such negotiations, “it doesn’t necessarily mean the patient goes to the best service, but maybe just the weakest personality caves.”

6.2.2.2 *Coordinating Care of Multiple Problems*

In the case of complicated patients who have no surgical issue, disagreements may arise among Internal Medicine physicians regarding which of the patient’s multiple problems is most serious or most demanding of attention. Just as surgeons may push back against accepting a patient they perceive to be “medically unwell” or medicine physicians may push back against admitting a patient whom they believe needs surgery, so subspecialty internal medicine physicians may be reluctant to accept patients who have conditions that are outside of their expertise. This can result in a series of back-and-forth conversations, often with the ED physician caught in the middle of disagreements between Internal Medicine services.

[I]t gets a little bit more frustrating, like if they’re, you know, if you give the story to an inpatient service assuming that they’re going to take the admission and then all of a sudden when you’re done with your entire handoff history, they say, “Oh you know what, this should actually go to this [other] service”. It gets a little frustrating as an ER doctor then saying, “Okay, well great. Who do you want me to contact now?” And then you page another person. Then you give them the entire story. Occasionally you’ll get a, “Oh really?”—you know, you tell them, the next person, the

same story, and they say, “Oh well, it really should’ve gone to the first guy.” And then you’re, you’re kind of going back and forth. (P203, ED attending)

In many such cases, the ultimate placement turns out to be General Medicine, what someone called “the service of last resort” and what several called a “dumping ground.” Similar terms have been noted in another admission handoff study (Apker et al., 2007). All of this may suggest again the idea of work avoidance. Some ED and General Medicine physicians do perceive such avoidance to be at play, but there are other explanations that acknowledge the difficult work of coordinating the care of multiple services and the fact that sub-specialists may be less aware or knowledgeable about specific conditions and treatments that lie outside of their specializations. One General Medicine resident provided an example.

It was a patient who had a lot of—kind of simultaneously presented with a lot of different things and it wasn’t clear what had happened first or what was making him the sickest I guess. He initially actually got called up to the Cardiology service because he had some blood work that showed some signs of stress in his heart that might have prompted the need for invasive cardiac catheterization. But he also had some problems with his pancreas and with new onset diabetes which are very general medicine problems. So the ED rightly or wrongly called him up to Cardiology, and the Cardiology resident accepted the patient but then digging deeper into what was going on thought maybe this is better served on the General Medicine service. Because, frankly, most Cardiology attendings, by the time they’ve been in cardiology for ten or fifteen years, don’t know how to deal with new onset diabetes. For patient benefit, the resident thought this patient would be better served on the General Medicine service. So we talked it over, and I said I would be happy to take it (P111, General Medicine resident)

The assumption contained in the quote is that even if General Medicine physicians lack the expertise to make specific decisions about certain more complicated or unusual problems, the broad scope of their specialization positions them well to coordinate the work of multiple specialties. But not everyone agrees with this perspective. Some are concerned about the coordination costs created by such arrangements. Using the example of a patient with both a gastrointestinal (GI) bleed and a heart attack, a different General Medicine resident asked rhetorically:

“Do they go to Cards [Cardiology] or GI? Usually they end up coming to Gen Med.” He laughs. He adds that he thinks it makes more sense for such a patient to go to one of the sub-specialty services so then there is only one consult. When the patient comes to Gen Med, P120 tells me, then you have two consults to manage. (Field notes, P120, General Medicine resident)

These two perspectives on the placement of complicated patients reveal a central tension. The hospital’s highly specialized knowledge, seen in the diversity of its specialty services, is a crucial dimension of the requisite variety (Conant & Ashby, 1970; Weick, 1979) it needs in order to deal with the variety of patients that flow through its doors. But a diversity of super-specialized knowledge, while necessary, is not sufficient. The hospital also needs the capability to coordinate that know-how dynamically for individual patients. These two quotes reveal conflicting perceptions of the role of General Medicine with regards to this coordination work. Furthermore, considering General Medicine’s reputation as a “dumping ground,” the question remains whether or not General Medicine has the appropriate skills, tools, and influence to accomplish this coordination safely, efficiently and effectively.

The service on which a patient is placed also can affect access to particular kinds of procedures and care. For example, the argument was made to me that a physician will see a patient more times per day and potentially spend more time thinking about the patient’s case if that patient is his or her primary responsibility. Conversely, if the physician is only consulting on the patient’s case, he or she may look in on the patient less frequently and be less centrally-involved in decisions.

Certain medical procedures are only provided by sub-specialists. For example, in the following quote, a hospitalist talks about patients who need a heart catheterization (“cath”), a procedure only done by a cardiologist. A cardiologist can perform this procedure on patients on his or her own service as well as on patients who have been admitted to a different service—patients for whom the cardiologist is a consult. While this hospitalist feels capable of taking care of a variety of heart patients, she talks about considering how

quickly the patient may need the catheterization when deciding whether or not to push back against the placement decision.

A lot of times I know [the patient is] going to need a cath in the morning, but if I take them onto my service—if they don't need an urgent cath that night, that's one thing—but if I wait and consult, then the cath doesn't happen until the next day, because the consult service doesn't round with the attending until the afternoon. The attending is the one who has to make the decision to cath or not cath, and so here's somebody ... who may need intervention quickly, then you know, [the ED physician will] say, 'Can you take this person?' I'll look at the EKG; I'll look at the enzymes; I'll hear the story; I'll look at the risk factors, and I will just call and say, 'I think this person merits a cardiologist today. So, I think that [Cardiology] should take them.' (P106, hospitalist)

This quote nicely illustrates how temporal rhythms of work in the hospital interact with placement decisions and shows that where a boundary is enacted for a patient can be consequential for the safety of and quality and efficiency of care provided to that patient. The hospitalist suggests that depending on what time of day the patient is admitted, the patient will get the catheterization much sooner if placed on the Cardiology service. The time savings could be crucial depending on the acuity of the patient's condition. However, we can imagine that, even in the case of a less acute heart problem, length of stay might be extended if the patient is kept in the hospital, awaiting the procedure. Knowing something about the temporal rhythms of other units within the hospital can be used strategically by clinicians to the benefit of individual patients and of the larger organization as well.

Many of the dynamics observed at Memorial Hospital are shaped by the policies and practices in place. At other institutions, where policies and practices differ, the dynamics would likely also differ. For instance, one hospitalist contrasted the placement practices of Memorial Hospital with those of a Veteran's Health Administration (VA) hospital where he had previously worked. According to this hospitalist, all patients admitted to the VA are placed on the General Medicine service, unless they go to Surgery. Sub-specialty Internal Medicine physicians do not admit patients. They only consult. As this hospitalist explained, admitting patients at the VA involves fewer conflicts; however, there can be greater

coordination issues involved in managing multiple consults. In the words of this hospitalist, “the VA system is easier on the front end [i.e., at admission], but can be more complicated on the back end.” In either policy scenario, boundaries get negotiated. It is largely a question of when.

6.2.3 Summary

Admission handoffs at Memorial Hospital often involve negotiations about the dispositioning of patients, including whether or not the patient requires admission and, if so, which service is best positioned to provide the needed care. I have identified two broad topics of disagreements which necessitate negotiations: disagreements over the acuity of the patient, and disagreements over what is the patient’s main illness. These negotiations address differing interpretations of the patient; therefore, the parties involved in handoff actively engage in framing the patient in particular ways. However, embedded in physicians’ arguments for particular understandings of patients are efforts to re-enact presumed boundaries between hospital units and evidence that such boundaries shape work. Although work avoidance may motivate some of this boundary work, many of the negotiations over boundaries may also be seen as evidence of physicians pressure-testing plans, working out safety, quality, and efficiency.

6.3 Maintaining Boundaries

The boundaries between hospital units are accomplished through the ongoing actions of hospital staff. As noted in the previous chapter, physicians sometimes refer to other physicians as “walls” and “sieves” to characterize their thresholds for admission. Walls are stubborn, resisting attempts to admit any patient onto their services other than those who represent a close fit with the perceived focus of their specializations. Sieves, on the other hand, rarely put up much resistance, mostly accepting any patient. The terms wall

and sieve imply boundaries—the one solid, the other permeable—so the use of these terms to describe particular physicians demonstrates the centrality of the actions of physicians to the re-enactment of boundaries. Indeed, the terms suggest, in some respects, the physicians themselves *are* the boundaries.

Physicians sometimes use the term “turf” to describe debates over responsibility between specializations or units. To “turf a patient” is to transfer the responsibility for a patient to another unit; that is to send the patient to someone else’s turf. Consider the use of the term by an ED attending in the following excerpt from my field notes.

The problem with this admit is you would think since she fell down and broke her hip, Ortho [Orthopedic Surgery] would take her, but they won’t. And there will be a huge turf war between them and Medicine. And it will cause me frustration. (Field notes, P201, ED attending)

Some of the negotiations that happen during admission handoffs may be thought of as debates over turf, as questions of where the borders lie, and as efforts to defend or even limit one’s turf. Over time, boundaries may shift one way or another as physicians increasingly resist or give in to negotiations during handoff. This may have longer-term consequences for organizational structure, power distributions, work flow, and professional identities.

In the quote above, the ED attending predicted that a negative turf war between Surgery and General Medicine would arise over the admission of an elderly female patient who had broken her hip. Indeed, the dispute that ensued involved four different services and at least six other physicians in addition to this ED attending. While this particular case proved to be more contentious than most I witnessed, it is not rare for some admissions to involve multiple services and multiple attempted yet stalled handoffs. A different ED attending told me that “It happens at least every shift. Probably more than once.”

The outcomes of the negotiations of admission handoffs have consequences for the dispositioning of patients. Over time, there may also be consequences for organizational

structure. In this section I further explore the negotiations of admission handoffs, looking closely at the actions of handoff parties that have consequences for the boundaries that establish some of the organization's divisions of labor. I address three kinds of actions that reveal efforts to maintain organizational boundaries: invoking and interpreting policies, keeping up with temporal rhythms, and diagnosing in the ED.

6.3.1 Invoking and Interpreting Policies

Memorial Hospital has many policies that are meant to guide the placement of admitted patients. For example, patients who have had a liver transplant should be admitted to the GI service. Patients who are on active chemotherapy, regardless of the complaint for which they are being admitted, should be placed on the Oncology service. Cystic Fibrosis patients are to be admitted to the Pulmonary service. Many other similar rules are meant to take the guesswork out of placement; however, policies cannot identify and direct all possible patient scenarios. Furthermore, to play a role in placement, policies often have to be actively invoked.

While the policies clearly indicate where to place certain kinds of patients, there are many gray areas that have to be interpreted dynamically. One hospitalist illustrated this with a particular example.

So this guy came in the ER with atrial fibrillation with RVR²⁹. The cardiology fellow had to go down urgently to evaluate him, and ... [twice] shocked him out of the afib with RVR because he was unstable. So it was a pretty significant episode of afib with RVR. And then, after they shocked him out of it, he had normal sinus rhythm.³⁰ [Hospital policy] says, "Uncomplicated afib with RVR goes to the Hospitalist service. Complicated afib with RVR goes to Cardiology." So we're like, okay, this is an afib with RVR that wasn't easily managed with medications. Is this considered complicated or not? [She laughs.] The [ED resident] was like, "I don't know." And she asked my opinion, and I'm like, well, if he's in normal sinus rhythm now and pretty stable, it would be pretty reasonable for [the Hospitalist service] to take care

²⁹ Atrial fibrillation with RVR (Rapid Ventricular Response) involves irregular electrical activity in both the atria and the ventricles of the heart.

³⁰ Normal sinus rhythm indicates a normal, constant rhythm of the heart beat.

of him. But that patient is probably going to need a cardiology consultation anyway because, [the patient may] need to be on anti-arrhythmics, you know, medications that we don't usually prescribe. Cardiology usually has to prescribe. So those are sort of the gray area patients where they need to see a cardiologist anyway. Why involve two people in there? Let's just have them be on the Cardiology service. (P112, hospitalist)

Straightforward in the abstract, the invoked policy appears ambiguous when faced with a particular borderline case. The hospitalist and the ED resident engage cooperatively in sensemaking, considering more than one way of defining the relative complicatedness of the patient's atrial fibrillation. If they consider what efforts were required in the ED to stabilize the patient, the condition seems complicated; however, if they consider post-intervention data, the condition seems no longer complicated. The policy frames the sensemaking by drawing the doctors' attention to the complicatedness of the atrial fibrillation, but the doctors generate their own criteria for determining complicatedness. Furthermore, the hospitalist introduces an additional consideration: the care the patient is likely to need in the near future. This consideration is then used to suggest a placement (i.e., Cardiology) that contradicts the one that the two doctors appear to have been moving toward (i.e., General Medicine) based on their interpretation of the policy. The work of dispositioning in handoff illustrated here is one that considers multiple concerns (e.g., the complicatedness of the illness and the ongoing care needs of the patients) and entertains more than one perspective (at least regarding the complicatedness). We see then that handoff and boundary work are complex endeavors, but much of this complexity is enacted by the actions of doctors when they eschew simple explanations and actively introduce and explore multiple concerns and perspectives.

To have an effect, policies must be invoked. That is, policies do not enforce themselves. It is not unusual for the burden of invoking policies to fall on the shoulders of the inpatient services. Prior to taking an admission handoff from the ED, many inpatient physicians will first conduct a chart biopsy, briefly examining the patient's electronic health

record to get a sense of that patient. In so doing, inpatient physicians are often checking to be sure that appropriate placement policies have been followed.

One of the more common examples of this involves the policy relating to the placement of Family Practice patients.

Family Medicine patients go to the Family Medicine service, and sometimes the Emergency Room docs just happen not to have checked that. There isn't just one flag in the computer that says, you know, "This is a Family Practice patient." You have to look at a couple different things. So sometimes I'll find a, you know, I'll be asked about a Family Medicine patient, I'll realize that looking through the notes... (P105, hospitalist)

In many cases, such patients would end up on a General Medicine service if the General Medicine physician did not actively look to see if this particular policy applied. The same is true for many other kinds of patients about whom there are policies regarding placement. This is not to say that ED physicians are unaware of the policies or that they intentionally ignore them. Rather there may be very little in the routines of the ED staff with regards to admission work that bring these policies into their consciousness. However, because these policies impact their workloads, inpatient staff have a stake in seeing that they are followed. Thus, it is often the actions of inpatient physicians that invoke the policies which play a part in maintaining the borders between the services.

As the hospitalist explains in the quote above, part of what makes the invoking of this particular policy difficult is that there is no simple way to determine whether or not a patient belongs to Family Practice. To make this determination, physicians typically scan the recent entries in the patient's electronic health record, looking for any from Family Practice. If they find an entry from Family Practice within the previous year, they consider the patient to belong to Family Practice and redirect the admission to that service. Gray areas emerge when the last entry from Family Practice is older than one year. On one occasion I observed a hospitalist struggling to decide if a particular patient qualified as a Family Practice patient given that it had been almost two years since she was last seen by a

Family Practice physician. The policy offered no answer. In the end, the hospitalist did not attempt to invoke the policy and accepted the patient onto his service, in part because he felt her condition might be more serious than what a Family Practice service would typically care for. This example again demonstrates the ongoing work to determine where boundaries lie and to maintain such boundaries. It also shows that boundaries, while partly established by policies, are reaccomplished by the day-to-day actions of clinicians.

6.3.2 Keeping up with Temporal Rhythms

Memorial Hospital is open 24 hours every day of the year. To accomplish this, the hospital relies on shift schedules, which we might think of as temporal divisions of labor. In this sub-section I examine the effects of shift schedules on admission work. I explore how the temporal rhythms such schedules create set up particular patterns of interaction and add to the challenges of coordinating across organizational boundaries. I also show how ongoing work is required in order to maintain the temporal divisions of labor.

6.3.2.1 Temporal Rhythms and Disposition Plans

Temporal work rhythms affect when various procedures and services are available. The ED is open 24 hours a day, 7 days a week, but many specialized procedures in the inpatient setting are not available at all times day and night. This reality affects decisions about disposition and placement, and thus, transitions of care and handoffs. For example, during an observation one Friday morning, an 82-year old male arrived in the ED with difficulty breathing. By the afternoon, after a series of tests and labs, the attending I was shadowing had ruled out pneumonia and a pulmonary embolism. Initial lab results “looked good” indicating the patient was most likely not having a heart attack. Given these results, the decision was made not to admit but to move the patient to another part of the ED where

he could receive a stress test and be watched overnight to be certain he was not having a heart attack. The plan was settled.

Then it was unsettled. Stress tests at Memorial Hospital are only performed Monday through Friday during the day. Suddenly realizing that it was Friday afternoon and that the stress test would not be available until Monday morning, the ED attending realized she had to come up with a different plan. Under insurance reimbursement rules, she could not keep the patient in the ED all weekend. One option would be to send the patient home and have the stress test scheduled for a later date in an outpatient setting. However, given the patient's advanced age, the attending was not comfortable sending him home. She therefore made the decision to admit the patient to be watched over the weekend and have the stress test on Monday.

As she shifted her thinking toward admitting the patient, the attending expressed to me her concern that the inpatient receiving physician would not be happy with the admission since there was not a strong indication of heart attack and other urgent diagnoses had been ruled out. Indeed, the General Medicine resident who took the handoff indicated she was not convinced the patient was at risk of heart attack: "It doesn't sound like it to me [...] We will see." After she hung up the phone, the ED attending said to me, "She's going to send him home tomorrow. That will make me so mad."

Thus, the temporal rhythms of the hospital, which affect the availability of services and resources, interacted with the dispositioning of this patient. Had it been a day earlier in the week, the patient could have been kept in the ED protocol unit and not admitted. As it turned out, the temporal rhythms dictated that the needed service would not be available soon enough. Given the attending's unwillingness to send the patient home, the resulting handoff situation was challenging because the ED physician lacked strong evidence to support her fear.

6.3.2.2 *Shift Schedules*

Shift schedules establish rather arbitrary boundaries that produce temporal rhythms which do not always coincide well with patient trajectories. That is, a patient may present in the ED and be seen by a physician when that physician's shift is nearing its end. Since it can be hard to predict how long the ED care trajectory will take, ED physicians may begin working on a patient and then reach the end of their shift before that patient's ED care trajectory is complete. In these instances, ED physicians must either sign out the patient to an in-coming colleague to complete the workup and handle the disposition, or else stay beyond the end of shift and complete the workup themselves. The work of an ED physician does not always fit neatly into the temporal boundary of an 8-hour shift. Planning and action on the part of the ED physician are necessary to maintain these temporal divisions of labor. Put differently, shifts, and the boundaries between them, persist in part because clinicians take particular actions to accomplish those boundaries.

The efforts to re-enact the temporal divisions of labor within the ED produce temporal rhythms that affect the work of clinicians in other parts of the hospital. In an effort to reduce the necessary number of signouts (i.e., within-unit handoffs), ED physicians often try to admit as many as possible of the patients who require admitting before shift end. In so doing, they are re-enacting the temporal boundaries of ED shifts, bringing as much of the work of one shift to a close before the start of the next shift. This practice is meant as a safeguard, ensuring that the physician who gives the handoff to the inpatient service is the individual who best knows the patient's case. But the practice can result in a significant number of admissions mid-afternoon. The inpatient physicians I spoke with called this "clearing out the ED." The result is a noticeable temporal rhythm, a frenzy of admission activity building as the afternoon wears on and then slowing down in the evening. Furthermore, because these handoffs are prompted by the artificial boundary of the shift

rather than by the natural conclusion of ED clinical work, it is not uncommon that additional uncertainties surround the cases of many of these patients, further challenging handoff communication.

A similar phenomenon occurs as a result of inpatient temporal rhythms. Each morning, General Medicine residents round with their attendings, discussing the patients on their service and making plans for that day's work. This practice, in turn, has the effect of making it virtually impossible for the ED to admit patients to General Medicine between roughly 6:00 AM and 7:00 AM—what some ED physicians call “the witching hour.” Because some ED night shifts end around this same time each morning, ED physicians rush to admit patients before the witching hour in order to ensure the admission handoff happens before their shifts end.

Likewise, inpatient services organize to handle the temporal rhythms produced by workflows in other units of the hospital. The hospitalist service, for example, utilizes a “swing shift” from 2:00PM to 7:00PM each weekday to address the spike in admissions that tends to occur in the late afternoon hours. During this shift, one hospitalist handles the admissions from the ED and elsewhere, allowing the other staff to concentrate on care of patients already on the service.

Thus, the structures of organizational routines in one part of the hospital can constrain work and conflict with the temporal divisions of labor in another part. But individuals and units are not powerless in such situations. Rather both physicians and services take particular actions that accomplish their own temporal divisions of labor—some permanent, some ephemeral—in the face of constraints imposed by the routines of other units.

6.3.3 Diagnosing in the ED

We can gain further insight into the ongoing work required to maintain the boundaries between hospital services, by looking more closely at the diagnostic work that happens in the Emergency Department. In this sub-section I explore the pressures ED physicians feel to perform certain diagnostic work, how they respond to these pressures, and what ED diagnostic work reveals about organizational boundaries.

Evidence produced by various diagnostic technologies, including labs and radiographic imaging, is valuable to efforts to sell admissions. During one interview, an ED resident used the phrase “make a good case.” I asked him what he meant by this.

To be able to gather enough evidence to support my argument why this person needs to be admitted because sometimes there—so that requires what I see on physical exam, critical parts in their history and also any objective data such as laboratory tests and any imagining tests I would be using. (P211, ED resident)

Note the use of the verb “to gather” in framing what it means to make a good case. The resident is aware that the work he does in care of the patient prior to handoff has consequences for what kind of case he can present during the handoff. In other words, care provided in the ED is not merely treatment of the patient, but it may also be thought of as building a case for disposition. This is an important distinction because it has consequences for the use of resources and the demands placed on the Emergency Department. If ED physicians sense a strong expectation that they provide a considerable amount of evidence to support their case for admission, they may feel pressured to order additional tests and labs beyond what they need to accomplish their primary responsibilities: to stabilize the patient, identify and address life-threatening emergencies, and create a disposition plan. In a culture that pressures ED physicians to create strong cases for admission, one that places the burden of proof on the shoulders of the emergency physician, ED physicians may find themselves pressured to engage extensively in the work of identifying and treating the underlying causes of disease.

One senior ED attending observed that the amount of diagnostic work undertaken in the Emergency Department had “substantially increased” over the course of his career. He went on to explain.

Roughly 80% of all the diagnostic tests that a patient has when they come into [the study site hospital] are done through the emergency department. [...] it's part of the reason we have such a long length of stay, I believe, but, we've also done the bulk of the diagnostic work and that what we're really waiting for in that other 20% of cases that are admitted or the other 20% of the diagnostic effort on patients who are admitted is, we're just -- oftentimes, waiting for the passage of time. (P206, ED attending)

According to this ED veteran, the burden of diagnostic work has slowly shifted over time from the responsibility of the inpatient services to the responsibility of the ED. The ongoing daily negotiations of admission handoffs may be playing a part in this shifting of boundaries.

ED physicians certainly do attempt to diagnose patients. In many instances, however, developing a differential diagnosis and ruling out or addressing the most critical of those diagnoses is the most that can be accomplished in the limited time patients can remain within the ED. Thus, many patients are still somewhat ambiguously diagnosed at the time of the admission handoff, and most ED physicians I spoke to seem to accept this as a necessary reality. Normative behaviors and accompanying expectations regarding diagnosing in the ED vary from one institution to another, as the following from my field notes indicates.

P215 tells me that he moonlights at a community hospital in a small town in another part of the state. “There, I call one person. That person sees the patient and determines where they [the patient] should go.... No arguments. That's how it should be.” He knows the simplicity of the smaller hospital allows this. He adds that at the community hospital, “the ED doesn't have to figure everything out,” adding that “here, we have to gift wrap them [the patients],” meaning that he feels pressured to sort out the patients' many complaints and diagnose clearly so the patient can be placed appropriately. (Field notes, P215, ED resident)

Other ED physicians used similar metaphors to “gift wrap” including “packaged with a big red bow,” to describe their sense of the expectations of inpatient physicians regarding the diagnostic work that should be done in the ED prior to handoff. This sense of expectation is

significant. It shows the tight connection between expectations and enacted boundaries, and it means that ED physicians will sometimes order certain tests not because they feel they need the results to disposition the patient, nor because anyone has requested the tests, but rather because they *anticipate* that the party to whom they hand off the patient will want those tests. By ordering the tests in advance, the ED physician intends to reduce the need for negotiations during handoff. Over time, however, this practice has the potential to shift the boundary of diagnostic responsibility between the ED and the inpatient services.

Some ED physicians feel the need to push back against the increasing expectation that the ED should fully diagnose or at least order various tests which might be necessary for settling on a final diagnosis but which are not necessary, in the view of the ED physicians, to stabilize the patient and rule out life-threatening illnesses. Another senior ED attending explained his view of the responsibility of the ED with regards to diagnosing.

Well I see it a bit differently, I think, than what admitting services sometime see it. And I kind of stress that to the residents. I kind of use this term, what is our duty? What is our duty here in the emergency department? And our duty isn't always the same duty I think as whoever gets the patient when they're on the floor. Their duty might be the same, might be different. But basically I see our role in trying to establish a diagnosis if possible and then obviously render the appropriate treatment. Now sometimes—that sounds fairly simple and straightforward enough but—especially here with the kind of patient population we see that often times there's a lot of convolution as to multiple organ systems that are problematic and kind of how to deal with that a bit more than the community setting. A patient often times comes in with—when you get right down to it a basic set of signs and symptoms that arise from a particular problem that needs to be addressed—addressed most acutely. And that may be a part of a bigger thing that's going on too that may need to be addressed as well but not in an emergency department. (P210, ED attending)

In talking about “duty” with regards to diagnosing patients, this attending makes a distinction between the duty of the inpatient physicians and the duty of the ED. He is defining a boundary between the ED and the inpatient services and advocating ED physicians actively police that boundary. The advice to stop and ask oneself, “What is our duty?” is, in effect, an attempt to avoid the subtle shifting of boundaries that can happen as

ED physicians engage more and more in diagnostic work. It is a call to actively maintain boundaries.

This ED attending went on to clarify, “When I say ‘duty,’ I’m not trying to make it sound particularly mechanical.”

So I would say what is our duty? What do we need to do? What’s the right thing to do for this patient for what they’re presenting for? Understanding that that might be all there is to do and they can go home or it might be all there is to do and they might be admitted. Or it might be a bigger piece but we’re not responsible for that bigger piece. That bigger piece is just going to tie up our bed a lot longer. It’s not going to enhance the patient’s emergency department visit. It’s stuff that can be handled safely and legitimately on the floor. It’s the bigger piece of the problem. We don’t have to get all that extra diagnostic testing because we’ve already taken care of, at least addressed in some manner, the problem that really needed to be addressed in the shorter term. And the determination is that the patient needed to come into the hospital, and then hand off that care to someone who is willing to then to address—sometimes the floor doesn’t see it that way. Sometimes the admitting team doesn’t see it that way. “Why don’t you get that test, that test, that test as well before the patient comes up here?” It’s like, “Why?” (P210, ED attending)

This attending defines a border based on division of responsibility (e.g., “we’re not responsible for that bigger piece”) and proposes criteria (e.g., enhancing the patient’s ED visit) for making that division. He justifies this boundary maintenance work by placing the case of the individual patient into the larger context of the many other patients being cared for or requiring attention in the hospital. As he notes, doing additional diagnostic work would just “tie up our bed a lot longer.”

If I had nothing else to do—it’s not so much me having something to do because me putting in for the study, or my resident, is not labor-intensive. It’s just that now we’re tying up that cart, that room, that cubicle, for another whatever, three, four, five hours for no legitimate reason. We know the patient needs to be admitted. Whereas, if it’s going to determine what goes on with the patient as far as does the patient go home versus being admitted, well, okay then that’s legitimate too, but if you’ve already determined, “No, this patient is going to need to come in,” and we’ve addressed the most emergent things and kind of calmed down that thing—but that’s a small piece of the bigger piece that kind of needs to be figured out. But that doesn’t have to tie up my bed. I’ve got patients in the waiting room trying to get back. (P210, ED attending)

A clear focus on disposition enables this physician to suggest when the ordering of additional diagnostic work is legitimate and when it is not. The driving concern is not one of

work-avoidance, but rather of workload management, discussed in the previous chapter. Here, the specific concern is what I have termed waiting-room pressures. ED physicians are often conscious of the somewhat steady influx of patients to the hospital, waiting to be cared for in the ED. The limited capacity of the ED to handle this influx generates a momentum to move patients through the ED as quickly as is safely possible. There is usually the sense that patients are waiting, “trying to get back.” As this and some previous quotes demonstrate, the concern about ordering additional diagnostic tests is that doing so will necessitate longer stays in the ED, slowing down throughput, one of the chief measures of ED efficiency. Concerns about overflowing waiting rooms—what one attending called the “massive backlog at our front door”—are never far from the ED physician’s mind. The ED has a limited number of beds, so the longer a given patient remains in the ED, the longer another patient may have to remain in the waiting room.

To be sure, there are other factors that are also driving the increase in diagnostic work undertaken in the ED. Most notably, physicians in both the ED and General Medicine pointed to the fact that diagnostics ordered by the ED receive priority over orders placed by other services in the hospital. Knowing that tests ordered from a general medicine service may take many hours or longer before they are done and the results available, inpatient physicians regularly ask ED physicians to order additional tests or to do additional work in the ED before sending patients to the floor.

6.3.4 Summary

Hospital policies and organizational charts create structures that form divisions of labor among units within the hospital. However, it is the ongoing, daily actions of individual doctors that produce and reproduce, maintain and change the boundaries between those units. I have shown that by invoking and interpreting policies, keeping up with temporal rhythms, and diagnosing in the ED, doctors re-enact and maintain boundaries.

6.4 Discussion

In this chapter I have analyzed how the division of labor into hospital units both affects and is affected by the negotiations of admission handoff. In describing the different kinds of disagreements that characterize such interactions, I have shown that admission handoffs may involve considerable boundary work. Doctors are not merely exchanging information during admission handoffs; they are also presuming, re-enacting, negotiating, and potentially altering the boundaries that structure the hospital's divisions of labor. Handoffs are therefore consequential not only for individual patients, but also for larger organizational orders.

The famous line from Robert Frost's poem *Mending Wall*—"Good fences make good neighbors"—implies that clear boundaries are desirable because they reduce uncertainty and preserve a clear separation between properties, thereby reducing conflict, which is also implied to be undesirable. In theory, clearly defined boundaries between organizational units can enable smooth, routine functioning. If we were to take this perspective to its fullest elaboration, we would have a world where policies clearly articulate all boundaries and patients would flow into the hospital and to the most appropriate unit with no need to discuss or deliberate disposition. The boundaries between which patients should be admitted and which should not would be indisputable. The boundaries between the various services of the hospital would likewise be clearly demarcated, making it plain which unit is best positioned to care for each patient. The result would be a harmonious, conflict-free organization.

But of course, the reality is that the boundaries between hospital units are not fully demarcated by policy, and even where they are well-defined, boundaries must be re-enacted through ongoing, situated, negotiative processes. Deliberation and discussion are often required in working out the dispositioning of patients. Each patient is somewhat

unique; many are complicated with some degree of uncertainty surrounding their conditions. Furthermore, when working out the dispositioning of individual patients, admission handoff parties must also negotiate the allocation of limited service capacities, the availability of resources, and other organizational concerns.

The narrator of *Mending Wall* questions the need for the wall and notes that there are forces at work that continually break down and shift the wall: “Something there is that doesn’t love a wall / That wants it down.” But for all his protestations about the wall, it is he who calls his neighbor to the annual ritual of rebuilding, and it is he who finds pleasure in the experience of rebuilding. As one literary scholar put it, “...he likes the yearly ritual. Because if fences do not ‘make good neighbors,’ the making of fences can” (Poirier, 1977, p. 105). That is, the process of constructing the wall and the interaction among neighbors that it affords may be as valuable if not more so than the wall itself. In other words, boundary work serves purposes beyond establishing divisions of labor.

This raises the question of what benefits may be achieved through the processes of negotiating boundaries during admission handoff. The negotiability of divisions of labor that becomes evident when admitting certain borderline patients may be indicative of flexibility that enables important organizational outcomes. Because boundaries are not sharply defined in all cases, doctors are able to employ judgment to shape approaches to care that fit the unique needs of individual patients, balanced against broader concerns of workload management and resource availability. The permeability of boundaries enabled by flexible policy is essential to the hospital’s ability to act appropriately in dynamic situations, and doctors engaged in handoff—who know the current state, capabilities, and needs of their respective units—may be in the best position to allocate divisions of labor on-the-fly. In other words, clearly demarcated boundaries do not have a corner on efficiency, or

on safety and quality for that matter. There are circumstances in which the boundary negotiations of handoff are necessary to ensure efficient, safe, high quality operations.

Furthermore, as the practice of medicine evolves—as technological, diagnostic, and therapeutic advances are made—the hospital is better able to adapt its practices and respond where boundaries are flexible.

This is not to suggest that the boundary negotiations of admission handoff are always beneficial. We have seen that they can be inefficient and may fan the flames of inter-unit animosities. From the beginning of this chapter, however, I have argued for a nuanced view of boundaries and boundary work, and for avoiding seeing the negotiations of divisions of labor as purely problematic.

Talk of boundaries naturally conjures up certain metaphors, most notably walls and fences. Indeed, my own invoking of the Frost poem may have contributed to that here. But, as we have seen, the clear, fixed demarcation that wall metaphors imply provides a poor fit with the reality that physicians face when coordinating the care of certain patients. The range and variety of patients and the complexity and uncertainties that characterize many cases are too great for policies to articulate the division of responsibilities in all possible situations. Some boundary ambiguity is inevitable, even desirable, so that the hospital can respond dynamically to input uncertainty (Argote, 1982), and organize to make best use of limited resources.

Moving beyond metaphors of walls and fences, the boundaries between units may be thought of as overlapping spaces, zones of shared responsibility. The metaphor of a Venn diagram may be useful for capturing this overlap. While there are some conditions that may be clearly the responsibility of one particular specialization, there are other conditions or levels of acuity that lie in a space between two or more specialties. In such cases, the care of the patient could be assumed by more than one unit. Often, other concerns, such as

capacities, are used to help make disposition decisions when confronted with patients in these overlapping spaces. The Venn diagram metaphor requires a shift in thinking and approach to care coordination where the hospital has previously thought of boundaries as walls. It suggests the units whose responsibilities overlap must think of the overlapping area as a shared sensemaking zone, where the involved parties collaborate to work toward the best solution for the patient. Such an approach likely requires policies and practices that create a level playing field where neither unit is disproportionately empowered.

6.4.1 Contributions

I have made several contributions in this chapter. First, I have provided an ethnographic account of the boundary negotiations of admission handoffs. In so doing, I join a small group of scholars that use a practice lens to examine boundary work in healthcare (Allen, 1997, 2002; Barley, 1986; Mizrachi et al., 2005; Strauss et al., 1963) and other types of organizations (Bechky, 2003). Many of these existing studies examine boundary work in the context of larger structural changes, such as national policy initiatives (Allen, 2002), technological innovations (Barley, 1986), and the introduction of new professions into the organization (Mizrachi et al., 2005). To the best of my knowledge, the work I have presented in this chapter is the first to examine doctors' boundary work in the context of day-to-day organizational routine.

Second, I have shown that the divisions of labor that segment the units of the hospital are ongoing, effortful accomplishments. The boundaries between hospital units are not fixed, but are flexible, contested, presumed, negotiated and re-enacted, in part, through the daily interactions of admission handoffs. Doctors presume boundaries based in large part on expectations shaped by past experience, act as if those boundaries exist, and thereby re-enact boundaries. When the boundaries presumed by one handoff party conflict with those presumed by another, negotiations become necessary. Over time, these

negotiations have the potential to shift boundaries, with consequences for organizational structures and outcomes.

Third, in showing that this boundary work plays out in admission handoffs, I have demonstrated the importance of handoff to larger organizational structure concerns of the hospital. I have provided an empirical example of how inter-departmental coordination routines play a part in producing and reproducing the very structure of the organization (Giddens, 1984), and over time have the potential to alter negotiated orders (Allen, 1997; Strauss, 1978; Strauss et al., 1963). Although admission handoffs typically involve coordinating the transfer of responsibility for individual patients, and therefore have consequences for those individual patients, there are also larger organizational ramifications. Patterns of resource usage, of allocations of responsibility, and of the dispositioning of populations of patients are being shaped, in part, by handoff interactions. Consequently, there is a need for greater attention to between-unit handoff.

Fourth, I have demonstrated empirically a central organizational challenge facing tertiary referral teaching hospitals, and likely many other complex organizations: achieving requisite variety demands both highly specialized expertise and highly effective, dynamic coordination of that expertise. The law of requisite variety asserts that a system must have internal variety that is at least equal to that of the variety in the environment with which it must cope (Conant & Ashby, 1970; Weick, 1979). To deal safely and effectively with an increasingly complex patient population, hospitals require increasing levels of highly-specialized expertise and technologies, but this increasing specialization brings with it increasing subdivision of labor. Because divisions of labor increase coordination costs (Becker & Murphy, 1992), this subdivision, in turn, threatens to fragment care and compromise safety, quality, and efficiency unless effective means of flexibly coordinating expertise and other resources are in place.

6.4.2 Implications

These findings have broad implications. First, a shift in thinking about admission handoffs—and perhaps other types of between-unit handoffs as well—is needed. Hospitals, policy makers, and researchers alike must recognize that these handoffs involve more than the safety and quality of care provided to individual patients. Given the role admission handoffs can play in re-enacting and potentially altering divisions of labor, efforts to evaluate or improve such handoffs must consider the larger organizational influences they exert.

Second, hospitals—at least tertiary referral and teaching hospitals—must recognize negotiations are an inevitable aspect of admission work. To fully remove the need for boundary negotiations from admission handoffs, hospitals would need policies that clearly demarcate all boundaries, accounting for all possible patient scenarios. In addition, hospitals would need to do one of two things: build the capacities of their various units to meet the maximum possible demand, or accept frequent scenarios where patients are turned away because no resources are available to serve them. The former would be inefficient at best. The latter would be unthinkable for caring professions. An alternative approach is needed.

Where patient conditions can be clearly articulated and evidence supports particular approaches to treatment, encoding clear divisions of labor into policy is warranted. Where more uncertainties and complexities surround conditions and where there is little or no evidentiary basis to direct treatment, more flexible policies that create shared decision spaces are desirable. However, even where clear divisions of labor can be encoded into policy, some amount of negotiation may be necessary to balance larger organizational concerns beyond the needs of the individual patient. Consequently, most admission handoffs in hospitals such as Memorial might need to be conducted in shared

decision spaces. Such spaces will likely need to be accompanied by a culture that fosters patient-centeredness, collaboration, mutual respect and appreciation for the different perspectives involved. Many of the Chapter 5 recommendations for addressing handoff negotiations more generally should also improve boundary negotiations.

Some flexibility along with coordination capabilities are required to mobilize resources dynamically into arrangements that accommodate present situations. Overlap of capabilities of different services is crucial to this kind of flexibility. General Medicine, for example, must be able to handle some heart patients, since it is unlikely Cardiology can adequately care for all possible heart patients at all times. By the same token, Cardiology must be able to take the simpler heart patients—those which General Medicine might normally take—when the latter is nearing capacity and the former is not. In other words, the hospital must be able to respond dynamically, to allocate the division of labor on-the-fly.

At Memorial Hospital, this overlap does exist, but there are conflicting views about this overlap, including whether or not it is even acknowledged and when and how it is to be used. Likewise, doctors do engage in such dynamic allocation of workloads; however, this appears to be a capability that evolved of necessity rather than one that has been consciously planned and carefully cultivated. If the boundary negotiations of handoff appear inefficient—and, indeed, in some cases described above they do—this might be taken as an indication that some policies that divide units should be made clearer. However, it might also be indication that what are needed are policies, practices, and cultural norms that facilitate effective, on-the-fly coordination and division of labor.

6.5 Conclusion

The modern, tertiary referral, teaching hospital is a complex, highly-specialized and highly-subdivided organization containing significant technological and knowledge resources and positioned to provide sophisticated levels of care to a wide variety of

patients. The subdivision of the practices of medicine and surgery into many subspecialties has enabled the hospital to provide these sophisticated levels of care. Challenges emerge, however, from the fact that illnesses present themselves in ways and in combinations that do not neatly match the divisions of labor of the modern hospital. The increase in knowledge and sophisticated approaches to care is associated with an increased division of labor, and where divisions of labor increase, coordination costs also increase (Becker & Murphy, 1992). Admission handoffs bring the challenges of intra-organizational coordination into focus. This chapter has examined the divisions of labor at Memorial Hospital as they pertain to the accomplishing of admission handoffs between physicians. I have shown that while policies do provide some formal encoding of boundaries, those boundaries must be re-enacted through the day-to-day negotiative interactions of organizational actors. Furthermore, because policies, of necessity, cannot perfectly describe all divisions of labor, some amount of defining and maintaining boundaries is accomplished by actors in the course of their daily work.

Chapter 7

Conclusion

In this dissertation, I have reported on a two-year ethnographic study of patient handoffs between Emergency Department (ED) and General Medicine physicians at one highly specialized tertiary referral teaching hospital. I have produced a grounded theory to explain how the multi-functional, situated nature of admission handoff contributes to practice variety. In so doing, I have problematized the dominant model of handoff as an information transfer activity by showing that admission handoffs are dynamic interactions that play out in a multi-dimensional social space in which ambiguities abound and emergent organizing is necessary. I have also shown that admission handoffs are potentially highly consequential not only for the care of individual patients, but also for the management of entire units and for the ongoing re-enactment of larger organizational orders.

In this final chapter, I review and synthesize my contributions. Then I discuss the implications of my work. I conclude with a discussion of limitations and possibilities for future research.

7.1 Contributions

The central contribution of this dissertation is a grounded theory that proposes a connection between micro-practices of physicians and larger organizational orders. Through a chain of interrelated activities, physicians construct understandings of patients, which then give rise to a need to negotiate those understandings and related activities, which in turn reproduces and potentially alters organizational divisions of labor. In this

section, I review and synthesize the main findings and conclusions of the three empirical chapters.

In Chapter 4, I argued that physicians actively construct understandings of their patients, over time, as they encounter, interpret, assemble, and reassemble information through socially-interactive processes within particular contexts and situations. Furthermore, I proposed a provisional framework of four building blocks—illness trajectory, baseline, care trajectory, and rationale—that appear to be relevant to and useful for understanding the wide variety of patients. This framework highlights the actions involved in assembling information and making connections between multiple points of data, often through abductive inferences. Given the dynamic, ongoing, interactive processes involved in understanding patients, I argued that holistic understandings of patients are greater than the sum of the pieces of information used in their construction, and that multiple understandings of a single patient are not only possible but likely. Furthermore, I identified and documented the emerging practice of chart biopsy, demonstrating how electronic health records change the distribution of information, potentially altering the interactions and outcomes of admission handoffs.

In Chapter 5, I characterized admission handoffs as negotiations, situated by entangled webs of motives and concerns which produce ambiguities. Because multiple understandings of a patient are possible and given the differing perspectives of various medical specializations, admission handoffs sometimes involve negotiations over conflicting understandings and alternative approaches to care or disposition. These negotiations are complicated by the need for involved parties to work through various ambiguities produced by an entangled web of patient uncertainties, workload management concerns, and physician characteristics. I concluded that ambiguities may be reduced and the nature of the negotiations simplified by clarifying policies and arranging processes to facilitate shared

decision-making. However, I argued that some degree of ambiguity will remain and that handoff standardization efforts should acknowledge the situated interpretations required for safe, flexible functioning.

In Chapter 6, I characterized the divisions of labor among physicians as ongoing effortful accomplishments. Boundaries between hospital units are neither fixed nor perfectly defined; rather, they are re-enacted by physicians as they interact and negotiate in admission handoffs. Over time, these interactions have the potential to shift perceptions of boundaries and to alter the division of labor in the hospital, with potential consequences for organizational outcomes. In a world where patient loads are variable and not completely predictable, operating in a flexible, efficient manner requires some overlap in the capabilities of organizational units, as well as practices that enable shared sensemaking and dynamic workload allocations by the parties who are best positioned to make such allocations.

Taken together, the findings of these three chapters provide a characterization of admission handoffs as multi-functional, situated, highly consequential organizational routines. They are multi-functional in that they simultaneously accomplish more than one end or the parties involved pursue various purposes. Among these are exchange of information; constructing understandings of patients; negotiating conflicting understandings and dispositioning of patients; learning about practice, the competencies of others, and the performance of other organizational units; triaging and planning of care; and the dynamic allocation of hospital work. Admission handoffs are situated in that they are shaped by a variety of contextual factors. Among these are the attention, actions, capabilities, habits, knowledge, and past experiences of individual physicians; the quality and nature of their relationships and interactions with others; the availability of information; the usability and accessibility of their tools and technologies; the demands and

distractions of other work activities and of the physical environment; the policies and routines of the organization; and perhaps the influence of larger societal contexts. Finally admission handoffs are consequential in that they may influence individual and organizational outcomes. The understandings to which such handoffs contribute and the negotiations they entail can impact the subsequent care of individual patients, as well as of entire units of patients. The outcomes of admission handoff negotiations may influence larger organizational concerns, including the relationships between services, the use of resources, the efficiencies of workflows, and the divisions of labor.

Variations in the practice of admission handoff may be understood as responses to this multi-functional, situated nature. Parties engaged in handoff dynamically adapt to the present situation. They work through ambiguities; pressure-test understandings; consider alternatives; manage workloads and workflows; attend to safety, quality and efficiency. In activities with high consequences for failure, heedful interrelating is essential to the reduction of errors and the effective adaptation to situation (Weick & Roberts, 1993). While all variations in practice are not beneficial, some variation is always necessary to organize safely, effectively and efficiently in the present moment.

Practices vary in part because many patients admitted through EDs of highly-specialized tertiary referral hospitals such as Memorial tend to have complicated medical histories and multiple morbidities. Their cases are not easily conveyed in data points or stereotypical narratives (Bruce & Suserud, 2005; Christianson, 2009; Patterson & Wears, 2010), and subsequently there can be considerable room for debate regarding approaches to care.

Practices vary in part because the physicians involved vary. In a highly-specialized teaching hospital, admission handoffs may involve anyone from a first-year resident to a

seasoned attending. The specializations, past experiences, training, and knowledgebase of the involved parties also runs an extensive gamut.

Practices vary in part because physicians on the receiving end of handoff enter with varying degrees of pre-constructed understandings of patients, due largely to the affordances of the electronic health record and the practice of chart biopsy. The questions and topics that might be raised by a physician on the receiving end of an admission handoff will, to some extent, depend on what understanding that physician has constructed prior to entering the handoff.

Practices vary in part because handoffs are more than information transfer activities. Rather, they are multi-functional; however, the exact mix of functions may vary from one instance to the next. The parties involved have multiple concerns they must manage simultaneously. They must balance efforts to understand and address the needs of the present patient with efforts to ensure a manageable service workload that will preserve safety and quality for entire units of patients. They must accommodate temporal divisions of labor without allowing these to compromise quality of care and safety. They manage reputations—their own and those of their department—and cultivate relationships with colleagues in other parts of the hospital. The transfer of accurate, essential information is crucial to handoff, but so are the many other functions handoffs accomplish.

7.2 Implications

In the three preceding empirical chapters, I have provided a number of implications for practice, including for the improvement of handoffs and of electronic health records. Here, I suggest a few broad implications.

The multi-functional, situated nature of admission handoffs indicates that it may be more desirable to standardize ways of interacting and processes for negotiating conflicts rather than the content and structure of handoff conversations. It is not possible to remove

all ambiguity and uncertainty; therefore, handoffs will often need to involve sensemaking. If heedful interrelating requires adaptation to situation, then handoff parties need the skills, tools, and culture to engage collectively and cooperatively in sensemaking—to identify, prioritize, and work through concerns together.

The negotiations and boundary work entailed in admission handoffs reveal the potential for the structures of the organization to interfere with patient-centered care. Divisions of labor are crucial for continuous and specialized operations, but they come with significant coordination costs (Becker & Murphy, 1992). Furthermore, as my study revealed, divisions of labor run the risk of producing at times fractures that fragment care and impede coordination. If variety is required in a complex system in order to deal effectively with variety in the environment (Conant & Ashby, 1970; Weick, 1979), then the hospital must be able to adapt flexibly to variable patient loads and the increasing medical complexity of patients. Hospitals need not only to provide the appropriate services, but also to enable and empower their members to organize those services most effectively for individual patients, as well as for populations of patients. Organizing is not only a strategic activity of leadership. It is also the ongoing, daily accomplishment of organizational members (Weick, 1995). Developing structures that allow for shared spaces of overlapping capabilities and fostering practices to enable organizational members to manage those spaces cooperatively, should allow the organization to adapt flexibly to the unknowable flow of equivocal inputs from the complex environment.

Finally, many of the dynamics and practices I have described are unique to between-unit handoffs. To be sure, there are aspects reported here that are also common to within-unit handoffs. For example, clinicians must construct understandings of patients in both handoff scenarios. They may have to work through ambiguities of language regardless of handoff type, although these ambiguities are likely to be more complex in between-unit

exchanges. When engaged in either type of handoff, clinicians are simultaneously accomplishing multiple functions, including learning about the functioning of the hospital, triaging, and planning care among other possibilities. But admission handoffs, as instances of between-unit coordination, entail added challenges and dynamics that emerge precisely because clinicians must work with and across organizational boundaries. Given the overwhelming focus on within-unit handoffs in the existing literature, an important contribution of this dissertation is a rich characterization of the unique complexities of between-unit handoff. This characterization highlights the importance of distinguishing between different types of handoff in research and improvement efforts, standardization requirements, and other policy initiatives.

7.3 Limitations and Future Work

The inductive, qualitative, interpretivist nature of my work limits me from saying anything about frequencies or from statistically generalizing to other settings. My intent has been to understand admission handoffs between physicians at one hospital and to characterize practice in a way that would offer new insights. If I have generalized, it has been to theory; that is with the intent of refining theory (Tsoukas, 2009).

My data were collected at a single institution, and this poses potential limitations. Memorial Hospital is a highly-specialized, tertiary referral, teaching hospital and, as such, offers services and expertise that the average US hospital does not. Its organizational structure is, therefore, more complex, and its patient population is likely more complicated medically than would be typical for smaller hospitals. Its academic affiliation and reputation as a research center, in turn, set up incentives that may differ significantly from those found in for-profit settings. Indeed, these various characteristics of Memorial appear to be directly relevant to the phenomena studied and the observations I have made. Consequently, the findings of this study may have more resonance and usefulness to other large, high-

specialized, academic medical centers than other institutional forms. One of the values of presenting qualitative research in richly descriptive forms as I have endeavored to do here is that it allows others to assess for themselves the degree to which their own institutions experience similar phenomena to those described.

I have attempted throughout the course of this study to maintain awareness of this limitation in part by frequently asking participants who have experiences at other hospitals to relate their experiences at Memorial to those other institutions. This approach was useful, for instance, in strengthening the argument about the role electronic health records are having in admission handoffs. While I only collected data at an institution with an EHR, many of my participants could speak to experiences in other hospitals which lacked them. This allowed me access to data for comparing and contrasting what I saw at Memorial.

My intent in this study was to understand the work of physicians, how they communicate and coordinate when admitting patients to the hospital. Of course, healthcare is a complex endeavor involving input from a diverse assortment of healthcare professionals, clerical staff, and administrators. Although I did gather some data from non-physicians in an attempt to understand something about how the work of others contributes to and is influenced by the work of physicians, I acknowledge that my analysis does not account for the work of non-physicians. It is certain that analyzing and incorporating the work of these other professions into the characterization I have presented here would reveal additional complexities and further expose the situated, multi-functional nature of handoff.

Future research could seek to incorporate the activities of other hospital staff. The limitations posed from using a single study site could be addressed by examining similar processes in other institutions. Studying admission handoff work in hospitals with different policies and practices, different medical record systems, different organizational structures

and services and different patient populations would yield data useful for further refining my theory and developing a more robust understanding of the situated, multi-functional nature of handoff.

Similarly, the practices of chart biopsy and the work of constructing an understanding of a patient are not limited to physicians nor to admissions work. Clinicians of all kinds make use of electronic health records at various points in the care trajectory. Likewise, all clinicians who provide care to a patient must, to some extent, construct some understanding of the patient's case. Furthermore, there is ongoing work involved in updating and refining these understandings. Further research should explore these matters.

References

- Abraham, J., & Reddy, M. C. (2010). Challenges to inter-departmental coordination of patient transfers: A workflow perspective. *International Journal of Medical Informatics*, 79(2), 112-122.
- Adler, P. S., Goldoftas, B., & Levine, D. I. (1999). Flexibility versus efficiency? A case study of model changeovers in the Toyota Production System. *Organization Science*, 10(1), 43-70.
- Al-Benna, S., Al-Ajam, Y., & Alzoubaidi, D. (2009). Burns surgery handover study: trainees' assessment of current practice in the British Isles. *Burns*, 35(4), 509-512.
- Alem, L., Joseph, M., Kethers, S., Steele, C., & Wilkinson, R. (2008). Information environments for supporting consistent registrar medical handover. *HIM Journal*, 37(1), 9-25.
- Allen, D. (1997). The nursing-medical boundary: a negotiated order? *Sociology of Health & Illness*, 19(4), 498-520.
- Allen, D. (2002). Doing occupational demarcation: The boundary work of nurse managers in a district general hospital. In A. M. Rafferty & M. Traynor (Eds.), *Exemplary Research for Nursing and Midwifery* (pp. 205-230). London: Routledge.
- Allen, D., Griffiths, L., & Lyne, P. (2004). Understanding complex trajectories in health and social care provision. *Sociology of Health & Illness*, 26(7), 1008-1030.
- Amato-Vealey, E. J., Barba, M. P., & Vealey, R. J. (2008). Hand-off communication: a requisite for perioperative patient safety. *AORN Journal*, 88(5), 763-770; quiz 771-764.
- Anderson, J., Shroff, D., Curtis, A., Eldridge, N., Cannon, K., Karnani, R. (2010). The Veterans Affairs shift change physician-to-physician handoff project. *Joint Commission Journal on Quality and Patient Safety*, 36(2), 62-71.
- Anderson, J. K., & Kaboli, P. (2007, April 25-28). *Physician to Physician Handoff: The Veterans Administration Cairo Project*. Paper presented at the Society of General Internal Medicine 30th Annual Meeting, Toronto, Ontario, Canada.
- Anderson, P. (1999). Complexity theory and organization science. (Perspective). *Organization Science*, 10(3), 216-232.
- AORN. Perioperative Patient 'Hand-Off' Tool Kit Retrieved September 8, 2010, from <http://www.aorn.org/PracticeResources/ToolKits/PatientHandOffToolKit/>
- Apker, J., Mallak, L. A., Applegate, E. B., 3rd, Gibson, S. C., Ham, J. J., Johnson, N. A. (2010). Exploring Emergency Physician-Hospitalist Handoff Interactions: Development of the Handoff Communication Assessment. *Annals of Emergency Medicine*, 55(2), 161-170.
- Apker, J., Mallak, L. A., & Gibson, S. C. (2007). Communicating in the "gray zone": perceptions about emergency physician hospitalist handoffs and patient safety. *Academic Emergency Medicine*, 14(10), 884-894.
- Argote, L. (1982). Input Uncertainty and Organizational Coordination in Hospital Emergency Units. *Administrative Science Quarterly*, 27(3), 420-434.
- Argote, L. (1999). *Organizational Learning: Creating, Retaining and Transferring Knowledge*. Norwell, MA: Kluwer.

- Argyris, C., & Schön, D. (1978). *Organizational Learning: A Theory of Action Perspective*. Reading, Mass: Addison-Wesley
- Arora, V., Johnson, J., Lovinger, D., Humphrey, H., & Meltzer, D. (2005). Communication failures in patient sign-out and suggestions for improvement: A critical incident analysis. *Quality & Safety in Health Care, 14*(6), 401-407.
- Arora, V. M., & Johnson, J. (2006). A model for building a standardized hand-off protocol. *Joint Commission Journal on Quality and Patient Safety, 32*(11), 646-655.
- Arora, V. M., Kao, J., Lovinger, D., Seiden, S. C., & Meltzer, D. (2007). Medication discrepancies in resident sign-outs and their potential to harm. *Journal of General Internal Medicine, 22*(12), 1751-1755.
- Arora, V. M., Manjarrez, E., Dressler, D. D., Basaviah, P., Halasyamani, L., & Kripalani, S. (2009). Hospitalist handoffs: a systematic review and task force recommendations. *Journal of Hospital Medicine, 4*(7), 433-440.
- Ash, J. S., Berg, M., & Coiera, E. (2004). Some unintended consequences of information technology in health care: the nature of patient care information system-related errors. *Journal of the American Medical Informatics Association, 11*(2), 104-112.
- Ashkanasy, N., Wilderom, C. P. M., & Peterson, M. F. (2000). Introduction. In N. Ashkanasy, C. P. M. Wilderom & M. F. Peterson (Eds.), *Handbook of Organizational Culture and Climate* (pp. 1-18). Thousand Oaks, CA: Sage Publications, Inc.
- Astion, M. (2004). The Result Stopped Here. Retrieved from <http://www.webmm.ahrq.gov/printview.aspx?caseID=65>
- Atkinson, P. A. (2004). The discursive construction of competence and responsibility in medical collegial talk. *Communication and Medicine, 1*(1), 13-23.
- Australian Healthcare & Hospitals Association. (2009). 2009 Issues Paper - Clinical Handover - System Change, Leadership and Principles Retrieved September 9, 2010, from http://www.aushealthcare.com.au/publications/publication_details.asp?pid=175
- Australian Medical Association. (2006). Safe handover: Safe patients *Report of the Australian Medical Association*.
- Axelrod, R., & Cohen, M. D. (1999). *Harnessing Complexity: Organizational Implications of a Scientific Frontier*. New York, NY: The Free Press.
- Barbera, M. L., Conley, R., & Postell, M. (1998). A silent report. *Nursing Management, 29*(6), 66-67.
- Barley, S. R. (1986). Technology as an occasion for structuring: Evidence from observations of CT scanners and the social order of radiology departments. *Administrative Science Quarterly, 31*(1), 78-108.
- Beach, C. (2006). Lost in Transition. *AHRQ Web Morbidity and Mortality Rounds on the Web* Retrieved August 5, 2008, from <http://webmm.ahrq.gov/case.aspx?caseID=116>
- Beach, C., Croskerry, P., & Shapiro, M. (2003). Profiles in patient safety: emergency care transitions. *Academic Emergency Medicine, 10*(4), 364-367.
- Bechky, B. A. (2003). Object Lessons: Workplace Artifacts as Representations of Occupational Jurisdiction. *The American Journal of Sociology, 109*(3), 720-752.
- Becker, G. S., & Murphy, K. M. (1992). The Division of Labor, Coordination Costs, and Knowledge. *The Quarterly Journal of Economics, 107*(4), 1137-1160.
- Behara, R., Wears, R., Perry, S., Eisenberg, E., Murphy, L., Vanderhoef, M. (2005). A Conceptual Framework for Studying the Safety of Transitions in Emergency Care. *Advances in Patient Safety: From Research to Implementation, 2*. Retrieved from <http://www.ahrq.gov/downloads/pub/advances/vol2/Behara.pdf>

- Benham-Hutchins, M. M., & Effken, J. A. (2010). Multi-professional patterns and methods of communication during patient handoffs. *International Journal of Medical Informatics*, 79(4), 252-267.
- Berger, P. L., & Luckmann, T. (1966). *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. New York: Anchor Books.
- Berkenstadt, H., Haviv, Y., Tuval, A., Shemesh, Y., Megrill, A., Perry, A. (2008). Improving Handoff Communications in Critical Care: Utilizing Simulation-Based Training Toward Process Improvement in Managing Patient Risk. *Chest*, 134(158-162).
- Bernau, S., Aldington, S., Robinson, G., & Beasley, R. (2006). From medical doctor to junior doctor: The medical handover -- a good habit to cultivate. *studentBMJ*, 14(5), 188-189.
- Bernstein, J. A., Imler, D. L., Sharek, P., & Longhurst, C. A. (2010). Improved physician work flow after integrating sign-out notes into the electronic medical record. *Joint Commission Journal on Quality and Patient Safety*, 36(2), 72-78.
- Bhabra, G., MacKeith, S., Monteiro, P., & Pothier, D. (2007). An experimental comparison of handover methods. *Annals of the Royal College of Surgeons of England*, 89, 298-300.
- Birnholtz, J. P., Cohen, M. D., & Hoch, S. V. (2007). Organizational Character: On the Regeneration of Camp Poplar Grove. *Organization Science*, 18(2), 315-332.
- Blatt, R., Christianson, M. K., Sutcliffe, K. M., & Rosenthal, M. M. (2006). A sensemaking lens on reliability. *Journal of Organizational Behavior*, 27(7), 897-917.
- Block, M., Ehrenworth, J. F., Cuce, V. M., Ng'ang'a, N., Weinbach, J., Saber, S. B. (2010). The tangible handoff: a team approach for advancing structured communication in labor and delivery. *Joint Commission Journal on Quality and Patient Safety*, 36(6), 282-287, 241.
- Blumer, H. (1969). *Symbolic Interactionism: Perspective and Method*. Berkeley, CA: University of California Press.
- Bodenheimer, T., Chen, E., & Bennett, H. D. (2009). Confronting The Growing Burden Of Chronic Disease: Can The U.S. Health Care Workforce Do The Job? *Health Affairs*, 28(1), 64-74.
- Bomba, D. T., & Prakash, R. (2005). A description of handover processes in an Australian public hospital. *Australian Health Review*, 29(1), 68-79.
- Borowitz, S. M., Waggoner-Fountain, L. A., Bass, E. J., & Sledd, R. M. (2008). Adequacy of information transferred at resident sign-out (in-hospital handover of care): a prospective survey. *Quality and Safety in Healthcare*, 17(1), 6-10.
- Bowker, G., & Star, S. L. (1999). *Sorting things out: classification and its consequences*. Cambridge, MA: MIT Press.
- Boynton, B. (2007). Structured communication for hand offs: a shift toward collaboration with senders and receivers of critical information. *Nurse leader*, 5(4), 18-20.
- Brindley, P. G., & Reynolds, S. F. (2010). Improving verbal communication in critical care medicine. *Journal of Critical Care*.
- British Medical Association, National Patient Safety Agency, & N. H. S. Modernisation Agency. (2005). Safe handover: Safe patients *Report of the British Medical Association and the National Patient Safety Agency*.
- Broekhuis, M., & Veldkamp, C. (2007). The usefulness and feasibility of a reflexivity method to improve clinical handover. *Journal of Evaluation in Clinical Practice*, 13(1), 109-115.
- Brophy, D. R. (2006). A comparison of individual and group efforts to creatively solve contrasting types of problems. *Creativity Research Journal*, 18(3), 293-315.

- Bruce, K., & Suserud, B. O. (2005). The handover process and triage of ambulance-borne patients: the experiences of emergency nurses. *Nursing in Critical Care, 10*(4), 201-209.
- Bruni, A., Gherardi, S., & Parolin, L. L. (2007). Knowing in a System of Fragmented Knowledge. *Mind, Culture, and Activity, 14*(1), 83-102.
- Buckley, T., & Gordon, C. (2010). The effectiveness of high fidelity simulation on medical-surgical registered nurses' ability to recognise and respond to clinical emergencies. *Nurse Education Today.*
- Campbell, D. A., Jr., & Thompson, M. (2007). Patient safety rounds: description of an inexpensive but important strategy to improve the safety culture. *American Journal of Medical Quality, 22*(1), 26-33.
- Campbell, E. M., Sittig, D. F., Ash, J. S., Guappone, K. P., & Dykstra, R. H. (2006). Types of unintended consequences related to computerized provider order entry. *Journal of the American Medical Informatics Association, 13*(5), 547-556.
- Campion, T. R., Jr., Denny, J. C., Weinberg, S. T., Lorenzi, N. M., & Waitman, L. R. (2007). Analysis of a computerized sign-out tool: identification of unanticipated uses and contradictory content. *AMIA Annual Symposium Proceedings, 99-104.*
- Carroll, K., Iedema, R., & Kerridge, R. (2008). Reshaping ICU ward round practices using video-reflexive ethnography. *Qualitative Health Research, 18*(3), 380-390.
- Caruso, E. M. (2007). The evolution of nurse-to-nurse bedside report on a medical-surgical cardiology unit. *Medsurg Nursing, 16*(1), 17-22.
- Castledine, G. (2006). The importance of a good shift handover of patients. *British Journal of Nursing, 15*(9), 524-524.
- Catchpole, K., Leval, M. R. D., McEwan, A., Pigott, N., Elliott, M., McQuillan, A. (2007). Patient handover from surgery to intensive care: Using Formula 1 pit-stop and aviation models to improve safety and quality. *Pediatric Anesthesia, 17*(5), 470-478.
- Catchpole, K., Sellers, R., Goldman, A., McCulloch, P., & Hignett, S. (2010). Patient handovers within the hospital: translating knowledge from motor racing to healthcare. *Quality & Safety in Health Care, 19*(4), 318-322.
- Charmaz, K. (2006). *Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis*. Thousand Oaks, CA: Sage.
- Chartrand, T. L., & Bargh, J. A. (1999). The chameleon effect: The perception-behavior link and social interaction. *Journal of Personality and Social Psychology, 76*(6), 893-910.
- Chatman, J. A., Bell, N. E., & Staw, B. M. (1986). The managed thought: The role of self-justification and impression management in organizational settings. In H. P. Sims, Jr. & D. A. Gioia (Eds.), *The Thinking Organization* (pp. 191-214). San Francisco: Jossey-Bass.
- Cheung, D. S., Kelly, J. J., Beach, C., Berkeley, R. P., Bitterman, R. A., Broida, R. I. (2009). Improving Handoffs in the Emergency Department. *Annals of Emergency Medicine, [Epub ahead of print]*.
- Christian, C. K., Gustafson, M. L., Roth, E. M., Sheridan, T. B., Gandhi, T. K., Dwyer, K. (2006). A prospective study of patient safety in the operating room. *Surgery, 139*(2), 159-173.
- Christianson, M. K. (2009). *Updating as part of everyday work: An interactional perspective*. Ph.D. Unpublished doctoral dissertation, University of Michigan, Ann Arbor, MI.
- Chu, E. S., Reid, M., Schulz, T., Burden, M., Mancini, D., Ambardekar, A. V. (2009). A structured handoff program for interns. *Academic Medicine, 84*(3), 347-352.
- Clark, H. H., & Brennan, S. E. (1991). Grounding in Communication. In L. Resnick, J. Levine & S. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 127-149). Washington, D.C.: American Psychological Association.

- Cohen, M. D. (2007). Reading Dewey: Reflections on the study of routine. *Organization Studies*, 28(5), 773-786.
- Cohen, M. D., & Bacdayan, P. (1994). Organizational Routines Are Stored As Procedural Memory: Evidence from a Laboratory Study. *Organization Science*, 5(4), 554-568.
- Cohen, M. D., Burkhart, R., Dosi, G., Egidi, M., Marengo, L., Warglien, M. (1996). Routines and Other Recurring Action Patterns of Organizations: Contemporary Research Issues. *Industrial and Corporate Change*, 5(3), 653-698.
- Cohen, M. D., & Hilligoss, P. B. (2010). The Published Literature on Handoffs in Hospitals: Deficiencies Identified in an Extensive Review. *Quality & Safety in Health Care*, 19(6), 493-497.
- Coiera, E. W. (2000). When conversation is better than computation. *Journal of the American Medical Informatics Association*, 7(3), 277-286.
- Coiera, E. W., Jayasuriya, R. A., Hardy, J., Bannan, A., & Thorpe, M. E. (2002). Communication loads on clinical staff in the emergency department. *The Medical Journal of Australia*, 176(9), 415-418.
- Committee on Patient Safety and Quality Improvement. (2007). ACOG Committee Opinion No. 367: Communication Strategies for Patient Handoffs. *Obstetrics and Gynecology*, 109(6), 1503-1506.
- Conant, R., & Ashby, W. R. (1970). Every good regulator of a system must be a model of that system. *International Journal of Systems Science*, 1(2), 89-97.
- Cooper, J. B. (2010). Using Simulation to Teach and Study Healthcare Handoffs. [Editorial]. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare*, 5(4), 191-192.
- Cooper, J. B., & Kamdar, B. B. (2010). Tacit Handover, Overt Mishap. *Morbidity and Mortality Rounds on the Web*, 2010(August 26). Retrieved from <http://www.webmm.ahrq.gov/case.aspx?caseID=219>
- Cooper, J. B., Long, C. D., Newbower, R. S., & Philip, J. H. (1982). Critical Incidents Associated with Intraoperative Exchanges of Anesthesia Personnel. *Anesthesiology*, 56(6), 456-461.
- Copp, L. (1972). Improvement of care through evaluation: change of shift report. *Bedside Nurse*, 5, 19-23.
- Corbin, J., & Strauss, A. C. (2008). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (3rd ed.). Thousand Oaks, CA: Sage.
- Coutsouvelis, J., Corallo, C. E., Dooley, M. J., Foo, J., & Whitfield, A. (2009). Implementation of a pharmacist-initiated pharmaceutical handover for oncology and haematology patients being transferred to critical care units. *Supportive Care in Cancer*.
- Croskerry, P. (2002). Achieving Quality in Clinical Decision Making: Cognitive Strategies and Detection of Bias. *Academic Emergency Medicine*, 9(11), 1184-1204.
- Croskerry, P. (2003). The importance of cognitive errors in diagnosis and strategies to minimize them. *Academic Medicine*, 78(8), 775.
- Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. London: Sage Publications.
- Crowston, K. (1997). A Coordination Theory Approach to Organizational Process Design. *Organization Science*, 8(2), 157-175.
- Dewey, J. (1922). *Human Nature and Conduct: An introduction to social psychology*. New York, NY: Henry Holt and Company.
- Dhingra, K. R., Elms, A., & Hobgood, C. (2010). Reducing Error in the Emergency Department: A Call for Standardization of the Sign-out Process. *Annals of Emergency Medicine*.

- Dunn, W., & Murphy, J. G. (2008). The Patient Handoff: Medicine's Formula One Moment. *Chest*, 134, 9-12.
- Ebright, P. R., Urden, L., Patterson, E. S., & Chalko, B. (2004). Themes surrounding novice nurse near-miss and adverse-event situations. *The Journal of Nursing Administration*, 34(11), 531-538.
- Egidi, M., & Narduzzo, A. (1997). The emergence of path-dependent behaviors in cooperative contexts. *International Journal of Industrial Organization*, 15(6), 677-709.
- Eisenberg, E. M., Murphy, A. G., Sutcliffe, K., Wears, R., Schenkel, S., Vanderhoef, P. (2005). Communication in Emergency Medicine: Implications for Patient Safety. *Communication Monographs*, 72(4), 390-413.
- Engesmo, J., & Tjora, A. H. (2006). Documenting for whom? A symbolic interactionist analysis of technologically induced changes of nursing handovers. *New technology, work, and employment*, 21(2), 176-189.
- Evans, A. M., Pereira, D. A., & Parker, J. M. (2008). Discourses of anxiety in nursing practice: a psychoanalytic case study of the change-of-shift handover ritual. *Nursing Inquiry*, 15(1), 40-48.
- Evans, S. M., Murray, A., Patrick, I., Fitzgerald, M., Smith, S., Andrianopoulos, N. (2009). Assessing clinical handover between paramedics and the trauma team. *Injury*, in press.
- Farnan, J. M., Paro, J. A., Rodriguez, R. M., Reddy, S. T., Horwitz, L. I., Johnson, J. K. (2010). Hand-off education and evaluation: piloting the observed simulated hand-off experience (OSHE). *Journal of General Internal Medicine*, 25(2), 129-134.
- Fassett, M., Hannan, T., Robertson, I., Bollipo, S., & Fassett, R. (2007). A national survey of medical morning handover report in Australian hospitals. *Medical Journal of Australia*, 187(3), 164-165.
- Feldman, J. A. (2003). Medical errors and emergency medicine: Will the difficult questions be asked, and answered. *Academic Emergency Medicine*, 10(8), 910-911.
- Feldman, M. S. (2003). A performative perspective on stability and change in organizational routines. *Industrial and Corporate Change*, 12(4), 727-752.
- Feldman, M. S., & Orlikowski, W. J. (2011). Theorizing Practice and Practicing Theory. *Organization Science*, [epub February 23, 2011].
- Feldman, M. S., & Pentland, B. T. (2003). Reconceptualizing Organizational Routines as a Source of Flexibility and Change. *Administrative Science Quarterly*, 48, 94-118.
- Feldman, M. S., & Rafaeli, A. (2002). Organizational routines as sources of connections and understandings. *Journal of Management Studies*, 39(3), 309-331.
- Ferran, N. A., Metcalfe, A. J., & O'Doherty, D. (2008). Standardised proformas improve patient handover: Audit of trauma handover practice. *Patient Safety in Surgery*, 2, 24.
- Fischer, J. (2004). Continuity of care: A causality of the 80-hour work week. *Academic Medicine*, 79(5), 381-383.
- Fisher, R., & Ury, W. (1981). *Getting to yes: Negotiating agreement without giving in*. Boston: Houghton Mifflin.
- Flanagan, M. E., Patterson, E. S., Frankel, R. M., & Doebbeling, B. N. (2009). Evaluation of a Physician Informatics Tool to Improve Patient Handoffs *Journal of the American Medical Informatics Association*, pre-print.
- Fletcher, K., Davis, S., Underwood, W., Mangrulkar, R., McMahon, L., & Saint, S. (2004). Systematic Review: Effects of Resident Work Hours on Patient Safety. *Annals of Internal Medicine*, 141(11), 851-857.
- Fletcher, K., Saint, S., & Mangrulkar, R. (2005). Balancing Continuity of Care with Residents' Limited Work Hours: Defining the Implications. *Academic Medicine*, 80(1), 39-43.

- Flick, U. (2007). *Managing Quality in Qualitative Research*. London: Sage.
- Forrester, K. (2005). Clinical handover: Can we afford the time? *Journal of Law and Medicine*, 13(2), 176-179.
- Foster, P. N., Sidhu, R., Gadhia, D. A., & DeMuis, M. (2008). Leveraging computerized sign-out to increase error reporting and addressing patient safety in graduate medical education. *Journal of General Internal Medicine*, 23(4), 481-484.
- Frank, G., Lawler, L. A., Jackson, A. A., Steinberg, T. H., & Lawless, S. T. (2005). Resident Miscommunication: Accuracy of the Resident Sign-out Sheet Retrieved Access Date, from <http://www.nahq.org/journal/online/pdf/webex0305.pdf>
- Friesen, M. A., White, S. V., & Byers, J. F. (2008). Handoffs: Implications for Nurses. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses. (AHRQ Publication No. 08-0043)* Retrieved April 23, 2008, from http://www.ahrq.gov/qual/nursesfdbk/docs/FriesenM_HOIN.pdf
- Fu, W. T., & Anderson, J. R. (2006). From recurrent choice to skill learning: A reinforcement-learning model. *Journal of Experimental Psychology: General*, 135(2), 184-206.
- Galinsky, A. D., Ku, G., & Wang, C. S. (2005). Perspective-Taking and Self-Other Overlap: Fostering Social Bonds and Facilitating Social Coordination. *Group Processes & Intergroup Relations*, 8(2), 109-124.
- Galinsky, A. D., & Moskowitz, G. B. (2000). Perspective-taking: Decreasing stereotype expression, stereotype accessibility, and in-group favoritism. *Journal of Personality and Social Psychology*, 78(4), 708-724.
- Gandhi, T. K. (2005). Fumbled handoffs: One dropped ball after another. *Annals of Internal Medicine*, 142, 352-358.
- Garling, P. (2008). Final Report of the Special Commission of Inquiry: Acute Care Services in NSW Public Hospitals Retrieved September 9, 2010, from <http://healthactionplan.nsw.gov.au/garling-report.php>
- Gaver, W. W. (1991, April 28 - June 5). *Technology Affordances*. Paper presented at the CHI 91 Human Factors in Computing Systems Conference, New Orleans, Louisiana.
- Gawande, A. A. (2007a). *Better: A surgeon's notes on performance*. New York, NY: Picador.
- Gawande, A. A. (2007b). The Checklist.(intensive care units and Peter Pronovost's medical care checklist). *The New Yorker*, 83(39), 86.
- Gee, J. P. (2005). *An Introduction to Discourse Analysis: Theory and Method* (2nd ed.). New York: Routledge.
- Gibson, J. J. (1979). *The Ecological Approach to Visual Perception*. New York, NY: Houghton Mifflin.
- Giddens, A. (1984). *The Constitution of Society: Outline of the Theory of Structuration*. Cambridge, UK: Polity Press.
- Gieryn, T. F. (1983). Boundary-Work and the Demarcation of Science from Non-Science: Strains and Interests in Professional Ideologies of Scientists. *American Sociological Review*, 48(6), 781-795.
- Gittell, J. H. (2002). Coordinating mechanisms in care provider groups: relational coordination as a mediator and input uncertainty as a moderator of performance effects. *Management Science*, 48(11), 1408-1426.
- Glaser, B. G., & Strauss, A. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago, IL: Aldine.
- Gosbee, J. (2010). Handoffs and communication: the underappreciated roles of situational awareness and inattentive blindness. *Clinical Obstetrics and Gynecology*, 53(3), 545-558.

- Greenberg, C. C., Regenbogen, S. E., Studdert, D. M., Lipsitz, S. R., Rogers, S. O., Zinner, M. J. (2007). Patterns of communication breakdowns resulting in injury to surgical patients. *Journal of the American College of Surgeons*, 204(4), 533-540.
- Groopman, J. (2007). *How doctors think*. New York, NY: Houghton Mifflin.
- Haig, K. M., Sutton, S., & Whittington, J. (2006). SBAR: A shared mental model for improving communication between clinicians. *Joint Commission Journal on Quality and Patient Safety*, 32(3), 167-175.
- Hamman, W. R., Beaudin-Seiler, B. M., Beaubien, J. M., Gullickson, A. M., Orizondo-Korotko, K., Gross, A. C. (2010). Using simulation to identify and resolve threats to patient safety. *American Journal of Managed Care*, 16(6), e145-150.
- Han, Y. Y., Carcillo, J. A., Venkataraman, S. T., Clark, R. S. B., Watson, R. S., Nguyen, T. C. (2005). Unexpected increased mortality after implementation of a commercially sold computerized physician order entry system. *Pediatrics*, 116(6), 1506-1512.
- Hanna, D., Griswold, P., Leape, L. L., & Bates, D. W. (2005). Communicating critical test results: safe practice recommendations. *Joint Commission Journal on Quality and Patient Safety*, 31(2), 68-80.
- Hardey, M., Payne, S., & Coleman, P. (2000). 'Scraps': hidden nursing information and its influence on the delivery of care. *Journal of Advanced Nursing*, 32(1), 208-214.
- Harris, K. T., Treanor, C. M., & Salisbury, M. L. (2006). Improving Patient Safety With Team Coordination: Challenges and Strategies of Implementation. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 35(4), 557-566.
- Hartswood, M., Procter, R., Rouncefield, M., & Slack, R. (2003). Making a Case in Medical Work: Implications for the Electronic Medical Record. *Computer Supported Cooperative Work*, 12(3), 241-266.
- Harvey, C. M., Schuster, R. J., Durso, F. T., Matthews, A. L., & Surabattula, D. (2007). Human Factors of Transition of Care. In P. Carayon (Ed.), *Handbook of Human Factors and Ergonomics in Health Care and Patient Safety* (pp. 233-248). Mahwah, NJ: Lawrence Erlbaum Associates.
- Hays, M. M. (2003). The phenomenal shift report: a paradox. *Journal for Nurses in Staff Development*, 19(1), 25-33.
- Hays, M. M., & Weinert, C. (2006). A dramaturgical analysis of shift report patterns with cost implications: a case study. *Nursing Economics*, 24(5), 253-262, 227.
- Hedberg, B., & Larsson, U. S. (2004). Environmental elements affecting the decision-making process in nursing practice. *Journal of Clinical Nursing*, 13(3), 316-324.
- Hendrich, A. L., Fay, J., & Sorrells, A. K. (2004). Effects of acuity-adaptable rooms on flow of patients and delivery of care. (CE Online). *American Journal of Critical Care*, 13(1), 35(11).
- Hendrich, A. L., & Lee, N. (2005). Intra-unit patient transports: time, motion, and cost impact on hospital efficiency. *Nursing Economics*, 23(4), 157-164, 147.
- Henneman, E. A. (2007). Unreported Errors in the Intensive Care Unit: A Case Study of the Way We Work. *Critical Care Nurse*, 27(5), 27-34.
- Heritage, J., & Maynard, D. W. (Eds.). (2006). *Communication in Medical Care: Interaction Between Primary Care Physicians and Patients*. Cambridge, UK: Cambridge University Press.
- Hillgoss, B. (2010, October 22-27). *Dissecting the Pre-Handoff Chart Biopsy: Information Seeking in the Electronic Health Record*. Paper presented at the Annual Meeting of the American Society for Information Science & Technology, Pittsburgh, PA.
- Hinami, K., Farnan, J. M., Meltzer, D. O., & Arora, V. M. (2009). Understanding communication during hospitalist service changes: a mixed methods study. *Journal of Hospital Medicine*, 4(9), 535-540.

- Hoban, V. (2003). How to...handle a handover. *Nursing Times*, 99(9), 54-55.
- Hopkinson, J. B. (2002). The hidden benefit: the supportive function of the nursing handover for qualified nurses caring for dying people in hospital. *Journal of Clinical Nursing*, 11(2), 168-175.
- Horwitz, L., Krumholz, H. M., Green, M. L., & Huot, S. J. (2006). Transfers of Patient Care Between House Staff on Internal Medicine Wards. *Archives of Internal Medicine*, 166(11), 1173-1177.
- Horwitz, L., Meredith, T., Schuur, J. D., Shah, N. R., Kulkarni, R. G., & Jenq, G. Y. (2009). Dropping the Baton: A Qualitative Analysis of Failures During the Transition From Emergency Department to Inpatient Care. *Annals of Emergency Medicine*, 53(6), 701-710.
- Horwitz, L., Moin, T., & Green, M. (2007). Development and implementation of an oral sign-out skills curriculum. *Journal of General Internal Medicine*, 22(10), 1470-1474.
- Horwitz, L., Moin, T., Krumholz, H. M., Wang, L., & Bradley, E. H. (2008). Consequences of Inadequate Sign-out for Patient Care. *Archives of Internal Medicine*, 168(16), 1755-1760.
- Horwitz, L., Moin, T., Krumholz, H. M., Wang, L., & Bradley, E. H. (2009). What are covering doctors told about their patients? Analysis of sign-out among internal medicine house staff. *Quality & Safety in Health Care*, 18(4), 248-255.
- Horwitz, L., Parwani, V., Shah, N. R., Schuur, J. D., Meredith, T., Jenq, G. Y. (2009). Evaluation of an Asynchronous Physician Voicemail Sign-out for Emergency Department Admissions. *Annals of Emergency Medicine*, 54(3), 368-378.
- Houser, N. (Ed.). (1998). *The Essential Peirce, Volume 2: Selected Philosophical Writings, 1893-1913* (Vol. 2). Bloomington: Indiana University Press.
- Howard-Grenville, J. A. (2005). The persistence of flexible organizational routines: The role of agency and organizational context. *Organization Science*, 16(6), 618-636.
- Howard, D. L., Silber, J. H., & Jobes, D. R. (2004). Do regulations limiting residents' work hours affect patient mortality? *Journal of General Internal Medicine*, 19(1), 1-7.
- Husserl, E. (1963). *Ideas: A General Introduction to Pure Phenomenology* (W. R. B. Gibson, Trans.). New York, NY: Collier Books.
- Hutter, M. M., Kellogg, K. C., Ferguson, C. M., Abbott, W. M., & Warshaw, A. L. (2006). The impact of the 80-hour resident workweek on surgical residents and attending surgeons. *Annals of Surgery*, 243(6), 864-871.
- Hyman, N., Moore, J., Cataldo, P., & Osler, T. (2010). The high yield of 1-year colonoscopy after resection: is it the handoff? *Surgical Endoscopy*, 24(3), 648-652.
- Iedema, R., Merrick, E., Kerridge, R., Herkes, R., Lee, B., Anscombe, M. (2009). Handover -- Enabling Learning in Communication for Safety (HELiCS): a report on achievements at two hospital sites. *The Medical Journal of Australia*, 190(11), S133-S136.
- Institute for Safe Medication Practices. (2005). Building a case for medication reconciliation. Retrieved from <http://www.ismp.org/newsletters/acutecare/articles/20050421.asp?ptr=y>
- Jagsi, R., Kitch, B. T., Weinstein, D. F., Campbell, E. G., Hutter, M., & Weissman, J. S. (2005). Residents report on adverse events and their causes. *Archives of Internal Medicine*, 165(22), 2607-2613.
- James, I., Andershed, B., Gustavsson, B., & Ternestedt, B. M. (2010). Knowledge constructions in nursing practice: Understanding and integrating different forms of knowledge. *Qualitative Health Research*, 20(11), 1500-1518.
- James, W. (1961). *Psychology: The Briefer Course*. New York, NY: Harper.

- Jeanmonod, R. K., Brook, C., Winther, M., Pathak, S., & Boyd, M. (2010). Dedicated Shift Wrap-up Time Does Not Improve Resident Sign-out Volume or Efficiency. *Western Journal of Emergency Medicine*, 11(1), 35-39.
- Jeffcott, S. A., Evans, S. M., Cameron, P. A., Chin, G. S., & Ibrahim, J. E. (2009). Improving measurement in clinical handover. *Quality & Safety in Health Care*, 18(4), 272-277.
- Jenkin, A., Abelson-Mitchell, N., & Cooper, S. (2007). Patient handover: time for a change? *Accident and Emergency Medicine*, 15(3), 141-147.
- Jiang, H. J., Elixhauser, A., Nicholas, J., Steiner, C., Reyes, C., & Bierman, A. S. (2000). Care of Women in U.S. Hospitals, 2000. Rockville, MD: Agency for Healthcare Research and Quality.
- Joint Commission. (2005). The Joint Commission's Sentinel Event Policy: Ten Years of Improving the Quality and Safety of Health Care. *Joint Commission Perspectives*, 25(5), 1-5.
- Joint Commission. (2006a, March 2, 2008). National Patient Safety Goals: 2006 Critical Access Hospital and Hospital National Patient Safety Goals Retrieved September 21, 2010, from http://www.jointcommission.org/GeneralPublic/NPSG/06_npsg_cah.htm
- Joint Commission. (2006b, April 3, 2007). Sentinel Event Statistics Retrieved Oct 1, 2010, from <http://www.jointcommission.org/SentinelEvents/Statistics/>
- Joint Commission. (2008). 2008 National Patient Safety Goals Handbook Retrieved August 27, 2010, from http://www.jointcommission.org/NR/rdonlyres/82B717D8-B16A-4442-AD00-CE3188C2F00A/0/08_HAP_NPSGs_Master.pdf
- Joint Commission. (2009a). Approved: 2010 National Patient Safety Goals. *The Joint Commission Perspectives*, 29(10), 1, 20-21. Retrieved from <http://www.jointcommission.org/NR/rdonlyres/DFBF9FFD-AF97-4CA1-A9C8-8102C2D77AE0/0/JCP1009.pdf>
- Joint Commission. (2009b). National Patient Safety Goal compliance trends by program Retrieved September 20, 2010, from http://docs.google.com/viewer?a=v&q=cache:q_TQ_AoVSDgJ:www.jointcommission.org/NR/rdonlyres/184406E5-0646-4D5A-A844-3DE467309F39/0/Hospitalprogram2008.pdf+patient+safety+goal+2e+site:jointcommission.org&hl=en&gl=us&pid=bl&srcid=ADGEESh0gLhHXgEd2vIR4MutEIQFpjIeB-QVu1e7BeYIK8EOVKwdkFWaT-c_J-8Vv_z0aQBNk4Yyttzkt7M3q8wnyrBRvQ30HASb1GXQH9NOz-42rtRWDuuq6y4QuzZ0k1twdCGa3YCA&sig=AHIEtbRhb--f50_qBndIBsq39MtMgVPK1A
- Joint Commission. (2010a). The Joint Commission 2009 Requirements Related to the Provision of Culturally Competent Patient-Centered Care Hospital Accreditation Program (HAP) Retrieved August 26, 2010, from http://www.jointcommission.org/NR/rdonlyres/5744E5F5-F7BC-400D-A1AD-3BD6002B09E4/0/2009_CLASRelatedStandardsHAP.pdf
- Joint Commission. (2010b). Patient Safety Solutions Retrieved September 10, 2010, from <http://www.jointcommission.org/PatientSafety/Solutions/>
- Joint Commission. (2010c). Standards Project Focuses Attention on High-Value Standards, Cuts 16 EPs. *The Joint Commission Perspectives*, 30(6), 1-6.
- Joint Commission. (2011). Facts about the Sentinel Event Policy Retrieved March 26, 2011, from http://www.jointcommission.org/assets/1/18/Sentinel_Event_Policy_3_2011.pdf

- Jones, D., Bates, S., Warrillow, S., Opdam, H., Goldsmith, D., Gutteridge, G. (2005). Circadian pattern of activation of the medical emergency team in a teaching hospital. *Critical Care*, 9(4), R303-306.
- Jordan, P. (1991). Psychiatric ward handovers. *Nursing Times*, 87(43), 40-42.
- Kaafarani, H., Itani, K., Petersen, L., Thornby, J., & Berger, D. (2004). Does resident hours reduction have an impact on surgical outcomes? *Journal of Surgical Research*, 126(2), 167-171.
- Kabrhel, C., Camargo, C. A., & Goldhaber, S. Z. (2005). Clinical Gestalt and the Diagnosis of Pulmonary Embolism. *Chest*, 127(5), 1627-1630.
- Keenan, G., Yakel, E., & Marriott, D. (2006). HANDS: A revitalized technology supported care planning method to improve nursing handoffs. *9th International Congress on Nursing Informatics, Seoul, South Korea*, 1-6.
- Kellogg, K. C., Breen, E., Ferzoco, S. J., Zinner, M. J., & Ashley, S. W. (2006). Resistance to change in surgical residency: an ethnographic study of work hours reform. *Journal of the American College of Surgeons*, 202(4), 630-636.
- Kelly, M. (2005). Change from an office-based to a walk-around handover system. *Nursing Times*, 101(10), 34-35.
- Kerr, M. P. (2002). A qualitative study of shift handover practice and function from a socio-technical perspective. *Journal of Advanced Nursing*, 37(2), 125-134.
- Kilpack, V., & Dobson-Brassard, S. (1987). Intershift report: oral communication using the nursing process. *Journal of Neuroscience Nursing*, 19(5), 266-270.
- Kim, G. R., Miller, M. R., Ardolino, M. A., Smith, J. E., Lee, D. C., & Lehmann, C. U. (2007). Capture and classification of problems during CPOE deployment in an academic pediatric center. *AMIA Annual Symposium Proceedings*, 414-417.
- Klaber, R. E., & Macdougall, C. F. (2009). Maximising learning opportunities in handover. *Archives of disease in childhood. Education and practice edition*, 94(4), 118-122.
- Kochendorfer, K. M., Morris, L. E., Kruse, R. L., Ge, B. G., & Mehr, D. R. (2010). Attending and resident physician perceptions of an EMR-generated rounding report for adult inpatient services. *Family Medicine*, 42(5), 343-349.
- Koppel, R., Metlay, J., Cohen, A., Abaluck, B., Localio, A., Kimmel, S. (2005). Role of Computerized Physician Order Entry Systems in Facilitating Medication Errors. *The Journal of the American Medical Association*, 293(10), 1197-1203.
- Kort, K. C., Pavone, L. A., Jensen, E., Haque, E., Newman, N., & Kittur, D. (2004). Resident perceptions of the impact of work-hour restrictions on health care delivery and surgical education: time for transformational change. *Surgery*, 136(4), 861-871.
- Lally, S. (1999). An investigation into the functions of nurses' communication at the inter-shift handover. *Journal of Nursing Management*, 7(1), 29-36.
- Lamont, M., & Molnar, V. (2002). The Study of Boundaries in the Social Sciences. *Annual Review of Sociology*, 28(1), 167-195.
- Landrigan, C. P., Rothschild, J. M., Cronin, J. W., Kaushal, R., Burdick, E., Katz, J. T. (2004). Effect of reducing interns' work hours on serious medical errors in intensive care units. *New England Journal of Medicine*, 351(18), 1838-1848.
- Lawrence, R. H., Tomolo, A. M., Garlisi, A. P., & Aron, D. C. (2008). Conceptualizing handover strategies at change of shift in the emergency department: A grounded theory study. *BMC Health Services Research*, 8(1), 256.
- Laxmisan, A., Hakimzada, F., Sayan, O. R., Green, R. A., Zhang, J., & Patel, V. L. (2007). The multitasking clinician: decision-making and cognitive demand during and after team handoffs in emergency care. *International Journal of Medical Informatics*, 76(11-12), 801-811.

- Lee, R. S., Woods, R., Bullard, M., Holroyd, B. R., & Rowe, B. H. (2008). Consultations in the emergency department: a systematic review of the literature. *Emergency Medicine Journal : EMJ*, 25(1), 4.
- Lempert, L. B. (2007). Asking Questions of the Data: Memo Writing in the Grounded Theory Tradition. In A. Bryant & K. Charmaz (Eds.), *The SAGE Handbook of Grounded Theory*. London: Sage.
- Levinthal, D., & Rerup, C. (2006). Crossing an apparent chasm: Bridging mindful and less-mindful perspectives on organizational learning. *Organization Science*, 17(4), 502-513.
- Levitt, B., & March, J. G. (1988). Organizational Learning. *Annual Review of Sociology*, 14, 319-340.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Newbury Park, CA: SAGE.
- Liukkonen, A. (1993). The content of nurse's oral shift reports in homes for elderly people. *Journal of Advanced Nursing*, 18, 1095-1100.
- Lundberg, S., Wali, S., Thomas, P., & Cope, D. (2006). Attaining resident duty hours compliance: the acute care nurse practitioners program at Olive View-UCLA Medical Center. *Academic Medicine*, 81(12), 1021-1025.
- Luo, J., Hales, R., Hilty, D., & Brennan, C. (2001). Electronic sign-out using a personal digital assistant. *Psychiatric Services*, 52(2), 173-174.
- Lurie, N., Rank, B., Parenti, C., Woolley, T., & Snoke, W. (1989). How do house officers spend their nights? A time study of internal medicine house staff on call. *The New England Journal of Medicine*, 320(25), 1673-1677.
- Lyndon, A. (2006). Communication and teamwork in patient care: how much can we learn from aviation? *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 35(4), 538-546.
- Lyons, M. N., Standley, T. D., & Gupta, A. K. (2010). Quality improvement of doctors' shift-change handover in neuro-critical care. *Quality & Safety in Health Care*, 19(6), 1-7.
- March, J. G., & Simon, H. A. (1993). *Organizations* (2nd ed.). Oxford: Blackwell Publishing.
- Måseide, P. (2003). Medical talk and moral order: Social interaction and collaborative clinical work. *Text*, 23(3), 369-403.
- Mathias, J. M. (2006). A SHARED tool strengthens handoffs. *OR Manager*, 22(4), 15.
- Matthews, A. L., Harvey, C. M., Schuster, R. J., & Durso, F. T. (2002). Emergency Physician to Admitting Physician Handovers: An Exploratory Study. *Proceedings of the Human Factors and Ergonomics Society 46th Annual Meeting*, 1511-1515.
- Maughan, B. C., Lei, L., & Cydulka, R. K. (2010). ED handoffs: observed practices and communication errors. *The American Journal of Emergency Medicine, In Press, Corrected Proof*.
- Mazzocco, K., Petitti, D. B., Fong, K. T., Bonacum, D., Brookey, J., Graham, S. (2009). Surgical team behaviors and patient outcomes. *American Journal of Surgery*, 197(5), 678-685.
- McCann, L., McHardy, K., & Child, S. (2007). Passing the buck: clinical handovers at a tertiary hospital. *The New Zealand Medical Journal*, 120(1264), U2778.
- McDaniel, R. R., & Driebe, D. J. (2001). Complexity Science and Health Care Management. *Advances in Health Care Management*, 2, 11-36.
- McMahon, B. (1994). The functions of space. *Journal of Advanced Nursing*, 19(2), 362-366.
- Mead, G. H. (1934). *Mind, Self, and Society: From the standpoint of a social behaviorist*. Chicago, IL: The University of Chicago Press.
- Meltzer, D. O., & Arora, V. M. (2007). Evaluating Resident Duty Hour Reforms: More Work to Do. *Journal of the American Medical Association*, 298(9), 1055-1057.
- Miller, C. (1998). Ensuring continuing care: Styles and efficiency of the handover process. *Australian Journal of Advanced Nursing*, 16(1), 23-27.

- Mizrachi, N., Shuval, J. T., & Gross, S. (2005). Boundary at work: alternative medicine in biomedical settings. *Sociology of Health & Illness*, 27(1), 20-43.
- Moller-Jensen, J., Lund Pedersen, I., & Simonsen, J. (2006). Measurement of the clinical usability of a configurable EHR. *Studies in Health Technology and Informatics*, 124, 356-361.
- Montgomery Hunter, K. (1991). *Doctors' Stories: The Narrative Structure of Medical Knowledge*. Princeton, NJ: Princeton University Press.
- Montgomery, K. (2006). *How doctors think: Clinical judgement and the practice of medicine*. Oxford: Oxford University Press.
- Mukherjee, S. (2004). Becoming a physician: A precarious exchange. *New England Journal of Medicine*, 351(18), 1822-1824.
- Murphy, A. G., & Wears, R. L. (2009). The Medium Is the Message: Communication and Power in Sign-outs. *Annals of Emergency Medicine*, 54(3), 379.
- Nagpal, K., Vats, A., Ahmed, K., Vincent, C., & Moorthy, K. (2010). An evaluation of information transfer through the continuum of surgical care: a feasibility study. *Annals of Surgery*, 252(2), 402-407.
- Nelson, R. R., & Winter, S. G. (1982). *An Evolutionary Theory of Economic Change*. Cambridge, Mass: Belknap Press.
- Nemeth, C. P., Kowalsky, J., Brandwijk, M., Kanaha, M., Klock, P. A., & Cook, R. I. (2008). Between shifts: healthcare communication in the PICU. In C. P. Nemeth (Ed.), *Improving Healthcare Team Communication: Building on Lessons from Aviation and Aerospace* (pp. 135-153). Aldershot, UK: Ashgate Publishing.
- Nemeth, C. P., Kowalsky, J., Brandwijk, M., O'Connor, M., Nunnally, M., Klock, P. A. (2005). *Distributing cognition: How hand-off communication actually works*. Paper presented at the American Society of Anesthesiology.
<http://www.ctlab.org/documents/ASA2005%20Handoffs%20POSTER.pdf>
- Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, 2(2), 175-220.
- Norman, D. A. (1994). *Things that make us smart: Defending human attributes in the age of the machine*. Boston, MA: Addison-Wesley.
- Nugus, P., & Braithwaite, J. (2010). The dynamic interaction of quality and efficiency in the emergency department: Squaring the circle? *Social Science & Medicine*, 70(4), 511-517.
- Nugus, P., Bridges, J., & Braithwaite, J. (2009). Selling patients. *BMJ (Clinical Research Ed.)*, 339(19-26 Dec), 1444-1446.
- Nugus, P., Greenfield, D., Travaglia, J., Westbrook, J., & Braithwaite, J. (2010). How and where clinicians exercise power: Interprofessional relations in health care. *Social Science & Medicine*, 71(5), 898-909.
- O'Byrne, W. T., 3rd, Weavind, L., & Selby, J. (2008). The science and economics of improving clinical communication. *Anesthesiology Clinics*, 26(4), 729-744, vii.
- O'Connell, B., & Penney, W. (2001). Challenging the handover. *Collegian: Journal of the Royal College of Nursing, Australia*, 8(3), 14-18.
- Olson, G. M., & Olson, J. S. (2000). Distance Matters. *Human-Computer Interaction*, 15, 139-178.
- Ong, M., Bostrom, A., Vidyarthi, A., McCulloch, C., & Auerbach, A. (2007). House Staff Team Workload and Organization Effects on Patient Outcomes in an Academic General Internal Medicine Inpatient Service. *Archives of Internal Medicine*, 167(1), 47-52.
- Ong, M. S., & Coiera, E. (2010). Safety through redundancy: a case study of in-hospital patient transfers. *Quality & Safety in Health Care*, [Epub ahead of print].

- Orlikowski, W. J. (1996). Improvising Organizational Transformation Over Time: A Situated Change Perspective. *Information Systems Research*, 7(1), 63-92.
- Orlikowski, W. J. (2000). Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations. *Organization Science*, 11(4), 404-428.
- Orlikowski, W. J. (2002). Knowing in Practice: Enacting a Collective Capability in Distributed Organizing. *Organization Science*, 13(3), 249-273.
- Paavola, S. (2005). Peircean Abduction: Instinct or Inference? *Semiotica*, 153(1-4), 131-154.
- Parke, B., & Mishkin, A. (2005). *Best Practices In Shift Handover Communication: Mars Exploration Rover Surface Operations*. Paper presented at the International Association for the Advancement of Space Safety Conference sponsored by ESA, NASA, and JAXA, Nice, France.
https://ctools.umich.edu/access/content/group/1121441283495-20574284/Research%20papers/Parke_Mishkin2005_BestPracticesShiftHandoverMars.pdf
- Parker, J., Gardner, G., & Wiltshire, J. (1992). Handover: The collective narrative of nursing practice. *Australian Journal of Advanced Nursing*, 9(3), 31-37.
- Patel, R. (2008). *Impact of Physician Perspectives on Handoff Standards and Practice At Two Teaching Institutions*. Masters Thesis. School of Information University of Michigan. Ann Arbor, MI.
- Patel, V. P., Raptis, D., Christofi, T., Mathew, R., Horwitz, M. D., Eleftheriou, K. (2009). Development of electronic software for the management of trauma patients on the orthopaedic unit. *Injury*, 40(4), 388-396.
- Patterson, E. S. (2008a). Dangerous Shift: Commentary Retrieved January 12, 2009, from <http://www.webmm.ahrq.gov/case.aspx?caseID=188&searchStr=patterson+Dangerous+shift>
- Patterson, E. S. (2008b). Structuring flexibility: the potential good, bad and ugly in standardisation of handovers. *Quality & Safety in Health Care*, 17(1), 4-5.
- Patterson, E. S., Roth, E. M., Woods, D., Chow, R., & Gomes, J. O. (2004). Handoff strategies in settings with high consequences for failure: lessons for health care operations. *International Journal for Quality in Health Care*, 16(2), 125-132.
- Patterson, E. S., & Wears, R. (2009). Beyond "Communication Failure". *Annals of Emergency Medicine*, 53(6), 711-712.
- Patterson, E. S., & Wears, R. L. (2010). Patient Handoffs: Standardized and Reliable Measurement Tools Remain Elusive. *Joint Commission Journal on Quality and Patient Safety*, 36(2), 52-61.
- Patterson, E. S., Woods, D. D., Cook, R. I., & Render, M. L. (2007). Collaborative cross-checking to enhance resilience. *Cognition, Technology & Work*, 9(3), 155-162.
- Patton, K. A. (2006). *Hand-off communication: practical strategies and tools for JCAHO compliance*. Marblehead, MA: HCPro, Inc.
- Perry, S. J., Wears, R. L., & Patterson, E. S. (Eds.). (2008). *High-Hanging Fruit: Improving Transitions in Health Care* (Vol. 3). Rockville, MD: Agency for Healthcare Research and Quality.
- Petersen, L., Brennan, T., O'Neil, A., Cook, E., & Lee, T. (1994). Does Housestaff Discontinuity of Care Increase the Risk for Preventable Adverse Events? *Annals of Internal Medicine*, 121(11), 866-872.
- Petersen, L., Brennan, T., O'Neil, A., Cook, E., & Lee, T. (1998). Using a computerized sign-out program to improve continuity of inpatient care and prevent adverse events. *Joint Commission Journal on Quality Improvement*, 24(2), 77-87.

- Philibert, I. (2007). Selected Articles on the Patient Hand-off Retrieved July 22, 2007, from http://www.acgme.org/acwebsite/dutyhours/dh_annotatedbibliography_patienthandoff_1207.pdf
- Philibert, I., & Leach, D. C. (2005). Reframing continuity of care for this century. *Quality & Safety in Health Care, 14*, 394-396.
- Philpin, S. (2006). 'Handing over': Transmission of information between nurses in an intensive therapy unit. *Nursing in Critical Care, 11*(2), 86-93.
- Pickering, B. W., Hurley, K., & Marsh, B. (2009). Identification of patient information corruption in the intensive care unit: using a scoring tool to direct quality improvements in handover. *Critical Care Medicine, 37*(11), 2905-2912.
- Pillow, M. (Ed.). (2007). *Improving Hand-Off Communication*. Oakbrook Terrace, IL: Joint Commission Resources.
- Plsek, P. E., & Greenhalgh, T. (2001). The challenge of complexity in health care.(Complexity Science, part 1). *British Medical Journal, 323*(7313), 625.
- Poirier, R. (1977). *Robert Frost: The Work of Knowing*. Stanford, CA: Stanford University Press.
- Pool, F., & Goergen, S. (2010). Quality of the written radiology report: a review of the literature. *Journal of the American College of Radiology, 7*(8), 634-643.
- Powell, S. (2007). SBAR-It's not just another communication tool. *Professional Case Management, 12*(4), 195-196.
- Propp, D. A. (2003). Emergency Care Transitions. *Academic Emergency Medicine, 10*(10), 1143-1144.
- Quan, S., & Tsai, O. (2007). Signing on to sign out, part 2: describing the success of a web-based patient sign-out application and how it will serve as a platform for an electronic discharge summary program. *Healthcare Quarterly, 10*(1), 120-124.
- Ramratnam, B., Gollerkeri, A., Martens, P., Schiffman, F. J., & Parameswaran, J. (1996). A study of cross-coverage calls. *Journal of General Internal Medicine, 11*(3), 189.
- Raptis, D. A., Fernandes, C., Chua, W., & Boulos, P. B. (2009). Electronic software significantly improves quality of handover in a London teaching hospital. *Health Informatics Journal, 15*(3), 191-198.
- Reason, J. (2005). Safety in the operating theatre - Part 2: human error and organisational failure. *Quality & Safety in Health Care, 14*(1), 56-60.
- Reddy, M. C., Dourish, P., & Pratt, W. (2006). Temporality in Medical Work: Time also Matters. *Computer Supported Cooperative Work, 15*(1), 29 - 53.
- Ren, Y., Kiesler, S., & Fussell, S. R. (2008). Multiple Group Coordination in Complex and Dynamic Task Environments: Interruptions, Coping Mechanisms, and Technology Recommendations. *Journal of Management Information Systems, 25*(1), 105-130.
- Richardson, R., & Kramer, E. H. (2006). Abduction as the type of inference that characterizes the development of a grounded theory. *Qualitative Research, 6*(4), 497-513.
- Riesch, H. (2010). Theorizing Boundary Work as Representation and Identity. [Article]. *Journal for the Theory of Social Behaviour, 40*(4), 452-473.
- Riesenberg, L. A., Leisch, J., & Cunningham, J. M. (2010). Nursing handoffs: a systematic review of the literature. *American Journal of Nursing, 110*(4), 24-34; quiz 35-26.
- Riesenberg, L. A., Leitzsch, J., & Little, B. W. (2009). Systematic Review of Handoff Mnemonics Literature. *American Journal of Medical Quality, 24*(3), 196-204.
- Riesenberg, L. A., Leitzsch, J., Massucci, J. L., Jaeger, J., Rosenfeld, J. C., Patow, C. (2009). Residents' and attending physicians' handoffs: a systematic review of the literature. *Academic Medicine, 84*(12), 1775-1787.

- Rudolph, J. W., Morrison, J. B., & Carroll, J. S. (2009). The Dynamics of Action-Oriented Problem Solving: Linking Interpretation and Choice. *Academy of Management Review, 34*(4), 733.
- Rughani, M. G. (2010). RE: Northern Ireland general surgery handover study: Surgical trainees' assessment of current practice. Kennedy R, Kelly S, Grant S, Cranley B. *Surgeon 2009, 7; 1: 10-13. Surgeon, 8*(1), 53.
- Runy, L. A. (2008). Patient Handoffs. *Hospital and Health Networks, 82*(5), 7.
- Sachdeva, A. K., Philibert, I., Leach, D. C., Blair, P. G., Stewart, L. K., Rubinfeld, I. S. (2007). Patient safety curriculum for surgical residency programs: Results of a national consensus conference. *Surgery, 141*(4), 427-441.
- Saldaña, J. (2009). *The coding manual for qualitative researchers*. London: SAGE.
- Salerno, S. M., Arnett, M. V., & Domanski, J. P. (2009). Standardized sign-out reduces intern perception of medical errors on the general internal medicine ward. *Teaching and Learning in Medicine, 21*(2), 121-126.
- Sandelowski, M. (2001). Real qualitative researchers do not count: The use of numbers in qualitative research. *Research in Nursing & Health, 24*(3), 230-240.
- Sandlin, D. (2007). Improving patient safety by implementing a standardized and consistent approach to hand-off communication. *Journal of Perianesthesia Nursing, 22*(4), 289-292.
- Sanfey, H., Stiles, B., Hedrick, T., & Sawyer, R. G. (2008). Morning report: combining education with patient handover. *Surgeon, 6*(2), 94-100.
- Schatzman, L., & Strauss, A. L. (1973). *Field Research: Strategies for a Natural Sociology*. Englewood Cliffs, NJ: Prentice-Hall.
- Schultz, K., Carayon, P., Hundt, A. S., & Springman, S. R. (2007). Care transitions in the outpatient surgery preoperative process: facilitators and obstacles to information flow and their consequences. *Cognition, Technology & Work, 9*(4), 219-231.
- Shannon, C. (1948). A Mathematical Theory of Communication. *The Bell System Technical Journal, 27*(July, October), 379-423, 623-656.
- Shem, S. (1978). *The House of God*. New York: R. Marek Publishers.
- Sherlock, C. (1995). The patient handover: a study of its form, function and efficiency. *Nursing Standard, 9*(52), 33-36.
- Shojania, K. G., Fletcher, K. E., & Saint, S. (2006). Graduate medical education and patient safety: A busy--and occasionally hazardous--intersection. *Annals of Internal Medicine, 145*, 592-598.
- Showell, C., Thomas, M., Wong, M. C., Yee, K. C., Miller, S., Pirone, C. (2010). Patient safety and sociotechnical considerations for electronic handover tools in an Australian ehealth landscape. *Studies in Health Technology and Informatics, 157*, 193-198.
- Sidlow, R., & Katz-Sidlow, R. J. (2006). Using a Computerized Sign-Out System to Improve Physician-Nurse Communication. *Joint Commission Journal on Quality and Patient Safety, 32*(1), 32-36.
- Singer, J., & Dean, J. (2006). Emergency physician intershift handovers: An analysis of our transitional care. *Pediatric Emergency Care, 22*(10), 751-754.
- Singh, H., Thomas, E. J., Petersen, L., & Studdert, D. M. (2007). Medical errors involving trainees: a study of closed malpractice claims from 5 insurers. *Archives of Internal Medicine, 167*(19), 2030-2036.
- Sinha, M., Shriki, J., Salness, R., & Blackburn, P. A. (2007). Need for standardized sign-out in the emergency department: a survey of emergency medicine residency and pediatric emergency medicine fellowship program directors. *Academic Emergency Medicine, 14*(2), 192-196.

- Skaalvik, M. W., Normann, H. K., & Henriksen, N. (2010). To what extent does the oral shift report stimulate learning among nursing students? A qualitative study*. *Journal of Clinical Nursing, 19*(15-16), 2300-2308.
- Sledd, R. M. D., Bass, E. J., Borowitz, S. M., & A.Waggoner-Fountain, L. (2006). *Supporting the characterization of sign-out in acute care wards*. Paper presented at the 2006 IEEE International Conference on Systems, Man and Cybernetics, Taipei, Taiwan https://ctools.umich.edu/access/content/group/1121441283495-20574284/Research%20papers/Sledd_EtAl2006_SupportingCharacterizationSignoutAcuteCare.pdf
- Smith, A. F., & Mishra, K. (2010). Interaction between anaesthetists, their patients, and the anaesthesia team. *British Journal of Anaesthesia, 105*(1), 60-68.
- Smith, A. F., Pope, C., Goodwin, D., & Mort, M. (2008). Interprofessional handover and patient safety in anaesthesia: observational study of handovers in the recovery room. *British Journal of Anaesthesia, 101*(3), 332-337.
- Solet, D. J., Norvell, J. M., Rutan, G. H., & Frankel, R. M. (2005). Lost in Translation: Challenges and Opportunities in Physician-to-Physician Communication During Patient Handoffs. *Academic Medicine, 80*(12), 1094-1099.
- Squire, L. R., & Kandel, E. R. (1999). *Memory: From Mind to Molecules*. New York: Scientific American Library.
- Staggers, N., & Jennings, B. M. (2009). The content and context of change of shift report on medical and surgical units. *Journal of Nursing Administration, 39*(9), 393-398.
- Star, S. L., & Griesemer, J. R. (1989). Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science, 19*, 387-420.
- Starbuck, W. H., & Farjoun, M. (Eds.). (2005). *Organization at the Limit: Management Lessons from the Columbia Disaster*. Malden, MA: Blackwell Publishing, Ltd.
- Stein, D. M., Wrenn, J. O., Johnson, S. B., & Stetson, P. D. (2007). Signout: a collaborative document with implications for the future of clinical information systems. *AMIA Annual Symposium Proceedings, 696-700*.
- Stetson, P., Johnson, S., Scotch, M., & Hripcsak, G. (2002). *The sublanguage of cross-coverage*. Paper presented at the American Medical Informatics Association Symposium, San Antonio, TX. https://ctools.umich.edu/access/content/group/1121441283495-20574284/Research%20papers/Uploaded%20April%202007/Stetson_EtAl2002_SublanguageOfCrossCoverage_DRAFT.doc
- Stiles, B. M., Reece, T. B., Hedrick, T. L., Garwood, R. A., Hughes, M. G., Dubose, J. J. (2006). General surgery morning report: a competency-based conference that enhances patient care and resident education. *Current Surgery, 63*(6), 385-390.
- Strange, F. (1996). Handover: an ethnographic study of ritual in nursing practice. *Intensive and Critical Care Nursing, 12*(2), 106-112.
- Strauss, A. (1978). *Negotiations*. San Francisco, CA: Jossey-Bass Inc.
- Strauss, A. (1993). *Continual permutations of action*. New York: Aldine de Gruyter.
- Strauss, A., Fagerhaugh, S., Suczek, B., & Wiener, C. (1997). *Social Organization of Medical Work*. New Brunswick: Transaction.
- Strauss, A., Schatzman, L., Ehrlich, D., Bucher, R., & Sabshin, M. (1963). The hospital and its negotiated order. In E. Freidson (Ed.), *The Hospital in Modern Society* (pp. 147-169). New York: Free Press.
- Strople, B., & Ottani, P. (2006). Can technology improve intershift report?: What the research reveals. *Journal of Professional Nursing, 22*(3), 197-204.
- Suchman, L. A. (1987). *Plans and situated actions: the problem of human-machine communication*. New York, NY: Cambridge University Press.

- Sutcliffe, K., Lewton, E., & Rosenthal, M. M. (2004). Communication failures: An insidious contributor to medical mishaps. *Academic Medicine, 79*(2), 186-194.
- Talbot, R., & Bleetman, A. (2007). Retention of information by emergency department staff at ambulance handover: Do standardised approaches work? *Emergency Medicine Journal, 24*(8), 539-542.
- Tamuz, M., & Thomas, E. J. (2006). Classifying and interpreting threats to patient safety in hospitals: Insights from aviation. *Journal of Organizational Behavior, 27*, 919-940.
- Thakore, S., & Morrison, W. (2001). A survey of the perceived quality of patient handover by ambulance staff in the resuscitation room. *Emergency Medicine Journal, 18*(4), 293-296.
- Thompson, K. R., Pirone, C. J., Crotty, M. M., Hancock, E. C., Thomas, M. J., & Turner, P. (2010). Safetech: Safe Tools for Electronic Clinical Handover - Summary of Research Findings. Adelaide, South Australia: South Australian Department of Health.
- Tsoukas, H. (2009). Craving for generality and small-n studies: a Wittgensteinian approach towards the epistemology of the particular in organization and management studies. In D. A. Buchanan & A. Bryman (Eds.), *The SAGE Handbook of Organizational Research Methods*. London: SAGE Publications.
- Tucker, A., & Edmondson, A. C. (2003). Why Hospitals Don't Learn from Failures: Organizational and Psychological Dynamics that Inhibit System Change. *California Management Review, 45*(2), 55-72.
- Turner, P., Wong, M. C., & Yee, K. C. (2009). A standard operating protocol (SOP) and minimum data set (MDS) for nursing and medical handover: considerations for flexible standardization in developing electronic tools. *Studies in Health Technology and Informatics, 143*, 501-506.
- Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases. *Science, 185*(4157), 1124-1131.
- Tversky, A., & Kahneman, D. (1981). The Framing of Decisions and the Psychology of Choice. *Science, 211*(4481), 453-458.
- Ulmer, C., Wolman, D. M., & Johns, M. M. E. (2008). Resident Duty Hours: Enhancing Sleep, Supervision, and Safety (pp. 480). Washington, DC: National Academies Press.
- Van Eaton, E. G., Horvath, K. D., Lober, W. B., & Pellegrini, C. A. (2004). Organizing the transfer of patient care information: the development of a computerized resident sign-out system. *Surgery, 136*(1), 5-13.
- Van Eaton, E. G., Horvath, K. D., Lober, W. B., Rossini, A. J., & Pellegrini, C. A. (2005). A randomized, controlled trial evaluating the impact of a computerized rounding and sign-out system on continuity of care and resident work hours. *Journal of the American College of Surgeons, 200*(4), 538-545.
- Van Eaton, E. G., McDonough, K., Lober, W. B., Johnson, E. A., Pellegrini, C. A., & Horvath, K. D. (2010). Safety of using a computerized rounding and sign-out system to reduce resident duty hours. *Academic Medicine, 85*(7), 1189-1195.
- Velji, K., Baker, G. R., Fancott, C., Andreoli, A., Boaro, N., Tardif, G. (2008). Effectiveness of an Adapted SBAR Communication Tool for a Rehabilitation Setting. *Healthcare Quarterly, 11*(3 Spec No.), 72-79.
- Vogus, T. J., & Sutcliffe, K. M. (2007a). The Impact of Safety Organizing, Trusted Leadership, and Care Pathways on Reported Medication Errors in Hospital Nursing Units. *Medical Care, 45*(10), 997-1002.
- Vogus, T. J., & Sutcliffe, K. M. (2007b). The Safety Organizing Scale: Development and Validation of a Behavioral Measure of Safety Culture in Hospital Nursing Units. *Medical Care, 45*(1), 46-54.

- Volpp, K. G. M., & Grande, D. (2003). Residents' Suggestions for Decreasing Errors in Teaching Hospitals. *The New England Journal of Medicine*, 348(9), 851-855.
- Wachter, R. M., & Shojania, K. (2004). *Internal bleeding: the truth behind America's terrifying epidemic of medical mistakes*. New York, NY: Rugged Land, LLC.
- Wakefield, D. S., Cyphert, S. T., Murray, J. F., Uden-Holman, T., Hendryx, M. S., Wakefield, B. J. (1994). Understanding patient-centered care in the context of total quality management and continuous quality improvement. *Joint Commission Journal on Quality Improvement*, 20(3), 152-161.
- Wayne, J. D., Tyagi, R., Reinhardt, G., Rooney, D., Makoul, G., Chopra, S. (2008). Simple Standardized Patient Handoff System that Increases Accuracy and Completeness. *Journal of Surgical Education*, 65(6), 476-485.
- Wears, R. L., Perry, S. J., Shapiro, M., Beach, C., Croskerry, P., & Behara, R. (2003). Shift changes among emergency physicians: Best of times worst of times. *Proceedings of the Human Factors and Ergonomics Society, 47th Annual Meeting*, 1420-1423.
- Wears, R. L., Perry, S. J., Wilson, S., Galliers, J., & Fone, J. (2007). Emergency department status boards: user-evolved artefacts for inter-and intra-group coordination. *Cognition, Technology & Work*, 9, 163-170.
- Webster, J. (1999). Practitioner-centered research: An evaluation of the implementation of the bedside hand-over. *Journal of Advanced Nursing*, 30(6), 1375-1382.
- Weick, K. E. (1979). *The Social Psychology of Organizing*. New York, NY: Random House.
- Weick, K. E. (1995). *Sensemaking in Organizations*. London: Sage.
- Weick, K. E., & Roberts, K. H. (1993). Collective Mind in Organizations: Heedful Interrelating on Flight Decks. *Administrative Science Quarterly*, 38(3), 357-381.
- Weick, K. E., & Sutcliffe, K. (2006). Mindfulness and the Quality of Organizational Attention. *Organization Science*, 17(4), 514-524.
- Weick, K. E., & Sutcliffe, K. M. (2001). *Managing the Unexpected: Assuring High Performance in an Age of Complexity*. San Francisco, CA: John Wiley & Sons.
- Wesorick, D. W., Fleming, A., Hsu, R., Kim, C., Lee, F., Lim, S. (2006). *Standardized observations of cross-cover events in hospitalized patients: What goes "bump" in the night?* Paper presented at the Society of Hospital Medicine National Conference, Washington, DC. https://ctools.umich.edu/access/content/group/1121441283495-20574284/Research%20papers/Wesorick_signout_poster.doc
- Whitt, N., Harvey, R., McLeod, G., & Child, S. (2007). How many health professionals does a patient see during an average hospital stay? *The New Zealand Medical Journal*, 120(1253).
- Wilcox, R. A., & La Tella, R. R. (2001). The personal digital assistant, a new medical instrument for the exchange of clinical information at the point of care. *The Medical Journal of Australia*, 175(11-12), 659-662.
- Williams, R. G., Silverman, R., Schwind, C., Fortune, J. B., Sutyak, J., Horvath, K. D. (2007). Surgeon information transfer and communication - Factors affecting quality and efficiency of inpatient care. *Annals of Surgery*, 245(2), 159-169.
- Wohlstetter, R. (1962). *Pearl Harbor: Warning and Decision* Stanford, CA: Stanford University Press.
- Wolf, Z. (1988). Nursing rituals. *Canadian Journal of Nursing Research*, 20(3), 59-69.
- Wolf, Z. (1989). Learning the professional jargon of nursing during change of shift report. *Holistic Nursing Practice*, 4, 78-83.
- Woods, D., D. (1998). Designs are hypotheses about how artifacts shape cognition and collaboration. *Ergonomics*, 41(2), 168-173.
- World Health Organization, & Joint Commission. (2007). Communication During Patient Handovers. *Patient Safety Solutions*, 1(3), 1-4.

- Ye, K., Taylor, D. M., Knott, J., Dent, A., & MacBean, C. (2007). Handover in the emergency department: deficiencies and adverse effects. *Emergency Medicine Australasia*, *19*(5), 433-441.
- Yonge, O. (2008). Shift report: a ritual play on a residential adolescent psychiatric unit. *Journal of Psychiatric and Mental Health Nursing*, *15*(1), 45-51.
- Young, R. J., Horsley, S. D., & McKenna, M. (2000). The potential role of IT in supporting the work of junior doctors. *Journal of the Royal College of Physicians of London*, *34*(4), 366-370.
- Zimmer, M., Wassmer, R., Latasch, L., Oberndorfer, D., Wilken, V., Ackermann, H. (2010). Initiation of risk management: incidence of failures in simulated Emergency Medical Service scenarios. *Resuscitation*, *81*(7), 882-886.