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Redesigning the Use of Electronic Health Records in the Exam Room: A Multidisciplinary Approach

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Abstract

Utilizing video-recordings and transcriptions of actual clinical interactions, as well as interviews with patients and physicians, this thesis analyzes how the use of electronic health records, and the information found within them, impact doctor-patient interaction and, in effect, notions of patient-centered care. 'Patient centered care,' a major area of focus in doctor-patient communication literature, is a style of interaction where the patient is put first and their concerns and feelings are given priority over the 'biomedical agenda' by the doctor. Using a multidisciplinary approach between language and social interaction and industrial and interaction design, this thesis proposes possible changes to electronic health records and exam rooms and, more importantly, how they are used to improve interactions between physicians and their patients in the contexts of patient-centered care.

Redesigning the Use of Electronic Health Records in the Exam Room:

A Multidisciplinary Approach

By

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B.I.D. Syracuse University 2013

THESIS

Submitted in partial fulfillment of the requirements for the

degree of Master of Arts in Communication and Rhetorical Studies

in the Graduate School of Syracuse University

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Chapter 1 - Introduction

An inevitable part about being human is at some point we all get sick. As theorized by Talcott Parsons (1951) when a person becomes ill they enter into the "sick role," which has specific rights and obligations. Two obligations that the sick person is socially obligated to are: One, they will try to get better. Two, they will do so by seeking technically competent help and comply with the treatment recommendations. If a sick person decides to adhere to these obligations s/he is likely to end up in a doctor's exam room.

The exam room is an important social and interactional stage for the doctor and patient, where the participants co-construct the description of the problem as well as negotiate the recommended treatment(s) (Heritage and Clayman, 2010). Most exam rooms vary in size and equipment depending on the scale and type of practice, the specialty of the physician, and the physician's preferences.[1] However, there is still a general exam room archetype, especially among primary care physicians[2]. A primary care exam room will typically have: an exam table, a writing surface and stool for the physician, a few chairs, a countertop with a sink, storage cabinets, hazard disposal containers, the doctors equipment, wall charts and diagrams, and informational pamphlets (Figure 1).

This archetype has remained largely unchanged for many years, however, the health care sector and how physicians and patients interact has not. According to Ventres and

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[1] For an examples of clinic types and effects on exam room see Vickery, 2012

[2] A primary care physician can be defined as "a generalist physician who provides definitive care to the undifferentiated patient at the point of first contact and takes continuing responsibility for providing the patient's care" (American Academy of Family Physicians).

FIGURE 1 - EXAM ROOM EXAMPLE[3]

Frankel (2010) two of the most important developments in ambulatory care[4] in the past 20 years are the advent of patient-centered care (henceforth PCC) practices and electronic health records (henceforth EHRs). PCC is an approach to healthcare that encourages a collaborative relationship between physicians and their patients, and EHRs are digital versions of patient health records. Both PCC and EHRs are discussed more below.

The general lack of change within the exam room in relationship with PCC and EHRs has become an increasingly important topic among healthcare professionals and designers within the last decade (Mayo, 2006; Vickery, 2012). The work I present here focuses on the developments of PCC and EHRs in relation to the exam room and each other. I seek to propose possible changes to EHRs and exam rooms and, more importantly, how they are used to improve interactions between physicians and their patients in the contexts of

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[3] This exam room is larger and more open than most, but reflects what is typically seen within the space.

[4] Ambulatory care can be defined as "Medical care provided on an outpatient basis *(patients that are not admitted for more than 24 hours),* including diagnosis, observation, treatment, and rehabilitation services." (MedicineNet.com) Parenthetical in italics added.

patient-centered care. I approach this endeavor from a multidisciplinary perspective between language and social interaction and industrial and interaction design, using an analysis of video recorded exams, and interviews with participants. What follows in this chapter is an explanation of patient-centered care, electronic health records, and my multidisciplinary approach.

1.1 Patient-centered Care

As mentioned, a sick individual is usually socially obligated to seek competent help to get better. According to Starr (1982) when a person seeks treatment from a doctor, they are expected to abandon any personal beliefs on their condition and accept the physician's diagnosis and treatment recommendations on "medical authority." Starr further states that medical authority comes from the patient's inability to treat his/herself, and a cultural authority given to physicians because they have been trained in and practice medicine. However, within the history of medicine the medical authority that favors the status of the physician has ebbed and flowed. According to Starr (1982), Shorter (1985), and Freidson (1986) the height of medical authority reached its peak around 1960 and has been declining since. Many factors have contributed to this decline including the evolving consumerist nature of patients shopping around and selecting a doctor (Heritage and Clayman, 2010), and the rise of bureaucratic and financial restrictions placed on physicians (Light, 2000). In the wake of the "golden age of doctoring" (McKinlay and Marceau, 2002) a new healthcare paradigm has emerged, that of patient-centered care.

Unlike other changes in healthcare, PCC efforts don't undercut the physician's authority as much as increase the patient's active involvement in their own care to build a

therapeutic relationship between the doctor and patient. PCC as defined by the Institute of Medicine (2001) is, "providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions" (p.3). Within a PCC practice physicians are still respected as those with the medical knowledge and training needed to treat the patient. However, contrary to the perspective that patients are expected to abandon any personal beliefs and accept the doctor's treatment recommendations in blind faith, doctors that practice PCC encourage their patients to express their personal beliefs and preferences. The doctor then takes the patient's beliefs and preferences into consideration when making a diagnosis and treatment recommendations. If a patient's beliefs are misled or faulty, physicians that practice PCC educate the patient on the mistake rather than simply ignoring or asserting an authoritative position. By taking the patients beliefs and emotions into consideration PCC is a more inclusive approach to healthcare than the biomedical approach, which reduces the patient's illness to a "set of signs and symptoms which are investigated and interpreted" (Mead & Bower, 2000, p.1088).

Since the late 1960s and early 1970s scholarship on patient-centered care has been substantial across multiple disciplines, medical practices, and stages of the doctor-patient interaction.[5] However, Mead and Bower (2000) note that there has been little theoretical consensus among the emerging literature to the main characteristics of PCC. Thus, to

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[5] Within LSI see Beach et al. (2004) for discussion on physicians' management of patients stated fears in oncology interactions, Byrne and Long (1976) for proposal of seven diagnostic styles that range in opportunity for patients to participate, and Heritage et al. (2007) for examination of multiple concerns eliciting differences between "some" and "any" framed questions.

streamline and simplify the large body of scholarship, they aggregated the work down into five key dimensions. They are summarized as such:

- *Biopsychosocial perspective* – A holistic approach that proposes a biological, psychological, and social perspectives is necessary to account for and address the full range of problems presented in primary care.
- *The 'patient-as-person'* - Involves attentiveness not only to the presented symptoms, but also to "understand the patient as an idiosyncratic personality within his or her unique context" (p.1089). Specifically how medical issues or even the fear of issues may relate to a patient's personal biography.
- *Sharing power and responsibility* – Promotes a more balanced relationship between the doctor and patient, where the patient is encouraged to voice their own opinion and weigh in on decisions being made.
- *The therapeutic alliance* – An understanding that emotional relationships between the doctor and patient have the ability to positively or negatively affect a patient's outcome. Therefore, doctors should address emotional 'context' in consultations.
- *The 'doctor-as-person'* – An acknowledgment of the doctor's subjectivity and affective relationship to the patient.

Using a PCC approach that incorporates these tenets can have some positive effects on the physician, patient, and the overall healthcare system. Pelzang (2010), states that PPC practices can improve the quality of the patient's care, reduce cost associated with care, and improve the satisfaction of care providers. Moreover, these effects are interconnected. First of all treating the patient as an individual with personal beliefs and lifeworld factors that affect their care can encourage the patient to disclose more information thus allowing the

physician to better diagnose and recommended treatment (Frankel, 2001; Beach et al., 2004). This also encourages patients to be more involved and take more responsibility for certain aspects of their care (Murphy, 2011). When patients feel more included and comfortable with treatment recommendations, they also tend to adhere to the treatment recommendations better (Roter & Hall, 2006). Patient adherence to treatment recommendations can reduce the need for additional doctor visits, tests, and treatment which in turn reduce the cost of care and strain on care providers (Touchette & Shapiro, 2008). Although PCC practices have many advantages they are not without challenges.

Some of the biggest challenges arise from implementing PCC practices within actual clinical encounters. Adopting PCC practices may require difficult structural changes to organizations (Robinson, 1991; Brown et al., 2006). PCC practices can also require more time and human resources to attend to patients (Buerhaus et al., 2005). There is also a lack of uniform methodology to measure patient behaviors and outcomes (Robinson et al., 2008; Nelson and Gordon, 2006). However complications like these can be expected when making major changes within a sector as large and complicated as the healthcare system, and should not persuade providers from adapting PCC practices.

1.2 Electronic Health Records

In the most basic respects electronic health records are a digital version of a patient's paper chart and history. EHRs have been around in some form for about the last two decades, but today they are commonly a software platform, linked to a central database, and ran on a desktop computer, laptop, or tablet device (e.g., an iPad). Much like their analog counterpart, EHRs contain the patient's: demographics, medical history,

diagnoses, medication list, immunization dates, allergies, lab results, doctor notes, and billing data (HealthIT.gov, 2013a). As theorized by Robinson (1998) this recorded information constitutes a version of the patient known as the 'inscribed patient,' opposed to the patient in the room, or 'embodied patient.'

However, what sets EHRs apart from analog patient records, is that they can be easily updated by and shared among all healthcare professions, caregivers, and pharmacists involved with the patient's care as well as the patient. The networking and sharing of information is a vital part of the healthcare system. Not only does proper communication management improve the efficiency of the healthcare provider it can also reduce the amount of errors that providers make (IoM, 2001; Tiernery, 2011; HealthIT.gov, 2014a; Pageler et al., 2014). Errors made by healthcare providers can be costly in financial terms, reputation, and the patient's health.

For example, clinician-investigator William Tierney, MD (2011), provides two versions of a story that illustrates the costs of errors. Each story begins the same way, "An 81-year-old man arrives at the emergency department in an ambulance. He's awake but he's confused. He has sustained a fall. He is unable to give a cogent history and nobody accompanied him in the ambulance" (p. 5-6). However, from here the stories deviate in their narrative.

In the first story, the ideal situation, the receiving emergency physician was able to look up the man's EHR which includes his medical history, medication list, allergy list, and notes from his neurologist, primary care physician, physical therapist, and past caregivers. With the provided information and a quick examination the doctor was able to diagnose, provide a treatment, and discharge the man after a short stay. Because of the information

made available the doctor was able to save time and resources by not having to order extra lab tests or do a lengthier examination.

In the other story the receiving physician does not have any information on the man and must run tests and an examination to determine what is wrong. During treatment caretakers administer a drug that the man is allergic to which causes negative reactions and ultimately leads to a series of events, ending with the man's death. Contrary to the first story, this version was not the ideal, but reality. Unfortunately for Tierney, this is how he lost his father.

Although reducing errors is an important potential for EHRs it is not the only benefit. EHRs are also stated to improve: the quality and convenience of patient care; patients participation in their care; care coordination; practice efficiencies and cost savings; the accuracy, legibility, and level of completion of documents (HealthIT.gov, 2014a,b,c). The amount of benefits believed to be possible with EHRs have led to a series of incentives and legislation, including the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009, to encourage healthcare providers to switch to EHRs (HealthIT.gov, 2014b,c).

Nevertheless, EHRs, like a lot of new developing systems have their issues. Issues with EHRs range from: overloading physicians with information and alerts that interrupt their work flow (Sittig & Singh 2012), failing to support efficient and effective clinical work (AMA, 2014b), removing physician's focus from their patients (Makoul, Curry, & Tang, 2001; Ventres, Kooienga, & Marlin, 2006; Ventres & Frankel, 2010; Nusbaum, 2011), and as stated by the physician during the interview, "Honestly, electronic records have exponentially increased clinicians' work." (Physician 1, personal communication, 3.19.15) These issues

originate with the design and implementation of EHRs. As it has been reported EHRs were design not around healthcare provider's use, but instead to support transactions and billing (Stead & Lin 2009) and to meet requirements of meaningful use programs[6] (AMA, 2014b). Negative effects caused by EHRs can be so significant that a recent study by the International Data Corporation (2013) found that 58 percent of ambulatory physicians were very dissatisfied, dissatisfied, or neutral with their current EHR technology. Top among the causes of dissatisfaction is a lost in productivity. EHR usability has become such a concern that the American Medical Association (2014a) released a statement in September 2014, requesting a design overhaul of EHRs.

It is to this statement that I align the purpose of this work. However, to accomplish a complete overhaul of EHRs is well beyond the scope of this thesis. Instead I will focus on components of the AMA's request, mainly concerning EHR use in the exam room. In the third chapter I will provide an analysis of EHRs in the exam room and how they can problematize the interaction, even though a majority of patients say they are not bothered by the use of EHRs during the exam (McCormack, 2014). Using this analysis, interviews with patients and doctors, and additional research, I will discuss in the fourth chapter potential design solutions that could improve the use of EHRs in the exam room.

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[6] Meaningful use is a set of criteria used to evaluate the quality of EHR use by physicians and hospitals in order to participate in the Center for Medicare and Medicaid Services (CMS) Incentive Program. For more information visit: http://www.healthit.gov/providers-professionals/meaningful-use-definition-objectives

1.3 Approach

My approach to this subject comes from two disciplines, that of language and social interaction (henceforth LSI), and industrial and interaction design (henceforth IID). This is not the first time these two disciplines have been paired. Communication scholars Mark Aakhus and Sally Jackson (2005) advocate for a more applied practice that makes deliberate interventions into the means and objects of communication through the development of a "theoretically informed design enterprise within Language and Social Interaction" (p. 412). However, I do not use one discipline inside the other, but the two in tandem. As I will discuss, this multidisciplinary perspective is a natural fit for I have been formally trained in both.

My training starts within design, but not in IID. In 2007, my junior year of high school, I was offered a job as a draftsman in an architectural firm. Over the next four years of employment my experience at the firm nurtured my interest in the relationship between people and the built environment. Not fully committed to architecture as a profession I entered into the industrial and interaction design program at Syracuse University and graduated in 2013. IID is a combination of two different but very closely related fields of design, industrial design and interaction design. Industrial design, which is the primary core of IID, is commonly viewed as the design of consumer and professional mass-produced products. Interaction design sometimes mistakenly thought of as only the design of digital interfaces can be summarized as "the creation of dialogue between a person and a product, service, or system" (Kolko, 2011 p.119). With the influence of these two fields, the program at Syracuse University encourages its students to consider not just the design of the product, but that product's position within a larger system of use and the interactions

between people and the product. A larger discussion of design methodology and process will be provided later on.

In addition to the perspectives taught in IID, I have come to view design not only as a method to create products, but as a means, a tool, or a force within humankind's relationship with the built world and other humans. As noted by design critic and theorist Alice Rawsthorn (2013) design's "elemental role is to act as an agent of change" (p.9). However, I believed that design alone is not as powerful an agent of change, but can become influential when paired with other disciplines. I started exploring design at the intersections of other disciplines, which led to a minor in psychology and ultimately to my current position as a M.A. candidate in the Communication and Rhetorical Studies graduate program at Syracuse University.

In my graduate studies I began drawing connections between my former studies and my current classes. Although my graduate work explored the intersections of IID and CRS from both rhetorical and LSI perspectives, I will only discuss the LSI work here. LSI is the parent field for many other fields (e.g., conversation analysis, and action implicative discourse analysis) that study human language, discourse, and interaction in use. I will discuss LSI in more depth in the methods chapter below. One intersection between LSI and IID I noticed is that both share connections to the social sciences (e.g., anthropology, sociology, and psychology). For LSI emerged as an independent area of study from the social sciences in the early 1970s (van Dijk, 1985), and IID started using the social sciences as a multidisciplinary means of addressing social and economic issues after World War II (Bayazit, 2004). From this shared connection to the social sciences, both use similar methods of research, such as video ethnography and content analysis, to study human

interaction. I believe that because of these similarities among others, LSI and IID pair well and make a strong analytical and pragmatic partnership.

1.4 Genesis

My inspiration for a partnership between LSI and IID originated from a short response to Tracy's (1997b) *Interaction Trouble in Emergency Service Requests: A Problem of Frames,* that I wrote for my graduate seminar Discourse and Social Institutions taught by Dr. Jeffrey Good. In the article Tracy examines conversations between callers and call takers of emergency calls, and identifies that interactional problems can arise from a mismatching of frames, or held perspectives of expectations, between the participants. The direct inspiration for this project emerges from Tracy's decision to use a grounded practical theory approach to her analysis, therefore not only identifying conversational issues but offering suggestions on how to improve the interaction. At the end of the piece, Tracy proposes two interventions to address complications within the interactions. First, she suggests a public service announcement to educate the public about the characteristics of emergency calls. Second, she proposes additional training for call takers to help them identify when issues are arising because of mismatched frames, and how to handle them when they occur.

Although, I applauded Tracy's pragmatic approach and suggestions, I wondered how many people would see and then remember a public service announcement when they were calling emergency services. Was there a more appropriate form of communication? My background in IID encouraged me to question if there were other means to address the issue. In my response I suggested two quick potential ideas that might also assist the

problem. First, what if during the ringtone period a message is relayed to the caller before the call taker answers? For example, a message similar to, “Emergency operators needs specific information to assist you, please provide any information that is requested,” might prime the caller for the interaction with the call taker. Next, in addition to Tracy’s suggestions of training, I questioned how the interface of the call taker’s computer log affects the interaction. Could the interface be redesigned to streamline the interaction and alleviate some complications? Aside from my discussion of additional potential interventions, it was nevertheless Tracy’s practical approach that intrigued me. It was from here that I became interested to how the methodologies of LSI could provide unique insight into problems that might not be considered by some designers.

The final term paper for the same seminar provided my first opportunity to combine LSI and design in my own writing, which is also the start of this work. In the paper I took inspiration from Tracy’s grounded practical theory approach and applied it to interactions between primary care physicians and their patients. Specifically in that paper, I sought to expand off of previous doctor-patient interaction scholarship by examining how periods of silence in the interaction can be marked as problematic, which in turn complicates the interaction ideals of patient-centered care practices. Like Tracy, once I had identified instances of interaction that were problematized I proposed opportunities to improve the interaction from both a LSI and design approach. I concluded the paper stating that it was my strong opinion that the practices of LSI and design nicely complement each other as research methodologies, but that additional research was needed to address limitations to my scope that I noted within the paper. It is the purpose of this body of work to expand off of my first paper and to further explore the partnership between LSI and IID.

1.5 Continuation of past scholarship

In the original paper that started this thesis, I made note of a few limitations within its scope, specifically that my analysis only covered a section of a larger research project. Both disciplines would use other research methods including interviews and surveys in addition to the observations made from the videos. Furthermore, designers would also prototype and test models and systems since it is their task to construct interventions to the identified issues. Lastly, the original analysis only provided one example of how the two disciplines could be used together, in order to fully make a case on the practicality of the partnership additional studies would be needed. It is the purpose of this thesis to expand upon where I had left off.

However, attempting to address all of the limitations of the original paper is still too much to accomplish in this body of work. In this thesis I start by revisiting the original paper within the third chapter. I do so to first apply action-implicative discourse analysis, a methodology develop by Tracy to complement the theoretical perspective of grounded practical theory. I will spend time discussing these methods as well as others in the next chapter. I then support the analysis with new information gathered from surveys and interviews with doctors and patients. Because of available resources I was not able to collect my own doctor-patient interactions, and thus there is a disconnect between the data used and the surveys and interviews. I discuss this in more detail and provide my reasoning for using separate data in Chapter Two.

Chapter 2 - Data and Methods

Central to any work is the methodology and theory used to frame it. The theoretical structure chosen informs the work from the subject matter, to what details to pay attention to. Although methods are important for a focused and articulate analysis, they can also obscure and render other information invisible or to the periphery. For example, Ochs (1979) argues that transcription is a form of theory and when an analysis highlights certain phenomena of speech they hide others. Although this visibility work could be problematic, it is important to recognize that no analysis could ever coherently cover the full extent of any text or interaction. Therefore, methods should be chosen to best fit the goals of the analysis.

I have chosen the following methodologies to assist my efforts of identifying and propose opportunities to improve the use of EHRs in the exam room in context of PCC practices. The methods of LSI, specifically grounded practical theory and action-implicative discourse analysis, provide a method to analyze and compare actual doctor-patient interactions with the ideal norms of PCC. Next, practices of IID provide a framework to organize insights from the analysis and work them into potential designed interventions. What follows is a description of the fields, methods, and data used within this work.

2.1 Language and Social Interaction

Although traces of the study of language and discourse extend back more than 2000 years ago to classic rhetoric, the contemporary studies of LSI emerged in the early 1970s as a method of studying texts and communication in systematic ways (van Dijk, 1985). The origins of this emergence started in the 1960s with a paradigm shift across various

language disciplines, such as linguistics, grammar, psychology, sociology, and anthropology.[7] The common shift among these disciplines was an attention towards discursive phenomena. Over the following decade the common interest on language and discourse would mold an autonomous and interdisciplinary study of language and social interaction (ibid).

The interdisciplinary nature of LSI has led to a vast array of subjects of study, or texts, ranging from early studies of narrative of folktale, to speeches, mass communication, and to naturally occurring interaction, which is the subject of this work. No matter the subject matter, the intent of LSI remains the same — the construction of knowledge as it relates to the use of language and discourse. As articulated by discourse scholars Wetherell, Taylor, and Yates (2001), "the study of discourse is the study of human meaning-making" (p. 3). By reversing Wetherell, Taylor, and Yates's statement another important point about studying discourse is made clear. The study of human meaning-making, an act that humans engage in everyday to understand how to navigate life's events, can be understood through the study of discursive interaction. Therefore to study discourse is to study how society is mediated.

Although my use of LSI also concerns itself with the construction of knowledge of how life is mediated by language and discourse, my intention does not stop there. The events of life are not perfect and problems do arise. Such problems are often identified as occurrences within the interaction. My interest within LSI, and this work, is how those problems might be articulated and addressed. This objective is supported by two practical

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[7] For an overview of the paradigm shifts in relation to the above mentioned disciplines, as well as a more extensive historic narrative of the study of discourse see (van Dijk, 1985)

approaches to LSI known as grounded practical theory and action-implicative discourse analysis.

2.1.1 Grounded Practical Theory

The theoretical approach to LSI that I use in this work, as well as the original paper, is grounded practical theory (henceforth GPT) developed by Craig and Tracy (Craig, 1989, 1992, 1993; Craig & Tracy, 1995). GPT originates from Craig's (1989) proposition that the field of communication should be a practical discipline rather than strictly a scientific one. Craig further contends that communication theory has been largely dominated by influences from a scientific paradigm which concerns itself with discovering how things are. (1993). Thus Craig and Tracy (1995) model GPT on normative theory which by contrast "is centrally concerned with what *ought to be;* it seeks to articulate normative ideals by which to guide the conduct and criticism of practice" (p.249). The scholars do note that normative theory is not enough on its own, for it does not automatically grant itself as being practically useful to the problems and requirements of the settings it covers. For example, Craig and Tracy cite how the rational models of problem-solving group discussions of a large, empirical research base (Gouran, Hirokawa, Julian & Leatham, 1993), have be criticized because of their irrelevance to the actual conditions under which problem-solving groups must perform (Stohl & Holmes, 1993). Therefore, to be practically useful normative theories must address actual problems that arise within the practice they cover. Craig and Tracy present GPT as a model that pragmatically applies normative theories through a reconstruction of the practice being examined. This reconstruction is developed at three

interrelated theoretical levels through a combination of observations of the practice and interviews with the participants.

- The technical level - Specific communicative strategies and techniques that are available to use within the practice.
- The problem level - Problems or dilemmas that affect the use of communicative strategies and techniques. As well as new strategies and techniques devised by the practice participants in response to the problems.
- The philosophical level: Situated ideas and overarching principles that provide participants with rationale for the resolution of problems. May also consist of trade-offs among competing goals. (Craig and Tracy, 1995)

2.1.2 Action-Implicative Discourse Analysis

Complimenting the theoretical perspective of GPT I use an approach based off of Tracy's methodological technique of action-implicative discourse analysis (henceforth AIDA) (Craig & Tracy, 2010; Tracy, 1995; 1997a). Craig and Tracy (2010) state that AIDA, "is centrally interested in describing the problems, interactional strategies, and ideals-in-use within existing communicative practices. It is an approach that melds the analytical moves of discourse analysis — attending to situated talk and texts — with the goals of developing and understanding that will be action-implicative for practical life" (p.146). AIDA therefore moves beyond the construction of knowledge to an informed response.

Like other studies of LSI, AIDA starts with audio/video recording the interaction of attention. However, after the data is record AIDA starts to differentiate from other common practices. First, in contrast to the often used transcriptions systems of other methods, such

as Jefferson's (see appendix A), Tracy proposes a simplified transcription method (see appendix B). Tracy's method, like other common transcription systems, captures the naturally occurring talk including restarts (pri-, primarily), repairs (I went to Sims-, Smith Hall), and vocalized nonfluencies (uhm, or mmm). However, it does not include prosodic (pitch, rhythm, etc) or timing details such as pauses. Tracy (1997a) offers three explanations to the level of detail in her transcription system. First, that AIDA is concerned with "conversational strategies about which people are capable of reflecting on as they contemplate action" (p.179), and although prosodic and timing details have implications to meaning making in LSI practices, they are largely in the unconscious control of participants and therefore harder to intervene with discursive practices. Furthermore, Tracy states that there is a practical trade off between the amount of interaction that can be examined and the amount of detail to which it is transcribed. Lastly, Tracy expresses that a lower transcription detail is more available to an interdisciplinary audience.

Beyond transcription detail, Tracy establishes additional differences between AIDA and other forms of LSI. She specifically draws a distinction between AIDA and conversation analysis (henceforth CA). Tracy (1997a) states that AIDA focuses on problems that participants experience and discursive techniques used to address them, where CA's goal is "to explain how social action is organized through conversational particulars" (p.15). This distinction relates back to Tracy and Craig statement above that communication studies should be a practical discipline. In further contrast to CA, an AIDA analysis will use additional resources beyond the recorded interaction. These resources may include

background information, researcher's knowledge gained through participation in the interaction, and interviews with participants.

At the beginning of this section I noted that I am using a methodological approach *based* on AIDA. I find that AIDA's attention to problems in the interaction, use of additional resources, and dedication to proposing responses to problems aligns to my purpose and complements the methods of IID. However, despite Tracy's reasonable justification for using a less detailed transcript for the observed interaction; my analysis will show that only focusing on discursive moves in interaction overlooks other details, such as embodied interaction and timing, that can problematize interaction. Therefore, in my analysis I use transcription methods and attention to other details commonly used in CA to supplement AIDA. Although I use elements of CA, I do not heavily draw enough from its methodology to warrant an elaborated description.[8]

2.2 Design

Design, the parent field of IID, is sometimes talked about as being one of humankind's oldest disciplines (Dreyfuss, 1955; Rawsthorn, 2013; Mars, 2014). That even before there was language to help construct civilizations (Lucaites & Condit, 1998), humans were using the design process to alter their environment and craft tools for survival. Surrounded in this alpha hubris lies some truth, a process, that is very similar to the design process used today, is a long standing, innate human activity. However, the modern profession, specifically industrial design, that based its practice around this human capacity

[8] For a history and discussion of CA methodology see (Heritage & Clayman, 2010; Atkinson & Heritage (Eds.), 1984)

to innovate started to form with the arrival of the Industrial Revolution in the 17th century (Heskett, 1980). According to Lidwell, Holden, and Butler (2003) early designers were generalists that studied art, science, and religion, and applied their knowledge to problems of the day. However, with the increase in quantity and complexity of knowledge led to specialization among designers. The two specializations that I use in this work are industrial design and interaction design. In the following pages I provide a brief discussion of each specialization and the design process used within the practices.

2.2.1 Industrial design

As mentioned in the introduction and above, industrial design is a practice of design that formalized with the Industrial Revolution and historically has focused on the mass production of consumer and professional products.[9] Even though such products are still the core focus of industrial design, the field has expanded into systemic and social issues since the late 1940s (Bayazit, 2004). For example, Project Masilueke an initiative of Frog Design, PopTech, iTeach and the Praekelt Foundation uses mobile technology to raise awareness and provide education to those living in African regions hit hardest by the global HIV/AIDS epidemic (Frog 2015).

The process used by industrial designers is explain below, but being an industrial designer requires at least a basic understanding of various disciplines. Because of industrial design's attention to aesthetics as well as function and efficiency; designers should be skilled craftsmen and artists with an understanding of the physical sciences. When conducting research to understand the end users of the design, designers often rely on

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[9] For a more in depth history of industrial design see Heskett (1980) and Pulos (1988).

research methods commonly used throughout the social sciences. Finally, because most products are made to be sold at market, a designer should have a basic understanding of communication, business, and marketing.

2.2.2 Interaction Design and User Experience Design

Interaction design the practice that creates how users, objects, and other people interact and communicate is often wrongfully simplified to screens and user interface design (UI).[10] Although information and communication technology is a large and growing part of the field of interaction design (Frog, 2013), it is nevertheless still only a part of the subject matter covered by interaction design. Gui Bonsiepe (1999), a human-computer interaction researcher, proposes that interaction design is a practice devoted to the creation of user interfaces, or points of interaction between users and objects, however, that such interfaces are not restricted to digital technologies but extend to typography and product design. Bonsiepe's more inclusive and holistic conception of interaction design shares a lot in common with another emerging speciality of design, that of user experience design (UX).

Nielsen and Norman (2015), explain UX design as, design that, "encompasses all aspects of the end-user's interaction with the company, its services, and its products" (¶1). Meaning that UX designers focuses on the user's experience at all points of interaction and how these interactions influence the overall experience. For example, even before a customer interacts with the interface of a self-check out machine at a grocery store, a UX designer would consider: what was the customers experience getting to the store, how was parking and getting inside, was the store organized and could they easily find what they

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[10] For example see Aakhus and Jackson (2005).

need, how long did they have to wait for an available check-out machine, etc. All of these steps are separate points of interaction between a customer and the grocery store, even though the interaction may not be facilitated through a screen. Consequentially all of these interactions affect the overall experience that customer has at that store and if they will become a returning customer.

2.2.3 Design Process

Even though industrial designers and interaction designers have their differences, both are concerned with making changes to the built environment. As Simon (1996) states designers are concerned with "how things *ought* to be — how they ought to be in order to *attain goals*, and to *function"* (p. 4-5). In order to intervene and make changes to how things ought to be, designers use a specific process to help them understand the situation, identify problems, and ideate and test potential solutions. Although the exact process can vary among designers and design groups, Martin and Hanington (2012) describe a simplified foundation design process in these phases.

1. Planning, scoping, and definition, where project parameters are explored and defined.
2. Exploration, synthesis, and design implications, is characterized by immersive research and design ethnography, leading to implications for design.
3. Concept generation and early prototype iteration, involving participatory and generative design activities.
4. Evaluation, Refinement, and Production, based on iterative testing and feedback.

5. Launch and Monitor, the quality assurance testing of design to ensure readiness for market and public use, and ongoing review and analysis to course-correct when necessary. (p.7)

Describing the process of design in such phases leads to the perception that the process is linear in format, in which when one phase ends another begins. However, what is typically the case is that phases are often returned to, overlap, and repeat throughout the process. Therefore, it might be better suited to look at the five sections not as phases or stages, but components of the design process. In this work I will largely use the first three parts of the process.

This first half of the process can be characterized as exploratory research. Exploratory research as described by Martin and Hanington (2012) is,

> typically conducted in the earliest stages of the design process, set by the planning, scoping, and definition phase, and leading to generative concept design. Activities are focused on gaining a solid knowledge base of the design territory and existing artifacts, and forging an empathic sense of the people targeted by the design work (p.84).

Exploratory research can come in the form of many different methods such as: interviews, surveys, observations, case studies, remote research, and ethnographic work. No matter what the method of research the purpose is the same, to help designer's identify opportunities and provide inspiration to design from.

2.3 Data

The data I use in this work comes from two sources. First, is a set of video recorded interactions between primary care physicians and their patients. The videos were recorded in southern California and central Pennsylvania between 2003 and 2004 for a larger study researching patient expressions of concerns (see Heritage & Robinson, 2006). For this current study, I use seven videos with a combined total of about 81 minutes of footage. Of the four different doctors in this data, one practices in southern California, and the other three practice in central Pennsylvania. Transcriptions of this data (Appendix C) employs an adaptation of Gail Jefferson's work (see Atkinson & Heritage (Eds.), 1984, pp. ix-xvi). (Appendix A)

The second selection of data, collected in late 2014-early 2015 in Central, NY, consists of surveys and interviews conducted with three patients and one primary care physician, and less than two hours of personal observations gathered during doctor visits. Interviews conducted with patients and physicians consisted of a 20 question pre-interview survey (Appendix D) and a 40 minute follow-up interview (Appendix E). Due to time and budget restraints, only one interview was transcribed. See Appendix F for this interview as well as info and materials on the other interviewees.

Due to available resources and protocol needed to record in hospitals, I was unable to conduct an entire new body of research that uses the same doctors and patients through out the analysis. Therefore, the patients and physicians interviewed share no connection with each other or the original data from 2003-2004. Nevertheless the purpose of the surveys and interviews with physicians and patients remains the same, to gather the

situated ideals about doctor-patient interaction and participants' thoughts and opinions on EHRs and the exam room.

Chapter 3 - Analysis of Health Records in Use

Using the theory and methods of GPT and AIDA discussed above, in this chapter I analyze the discursive and embodied actions in meetings between doctors and patients within the exam room. With this analysis I aim to: 1.) Show how physicians use EHRs in the exam room, 2.) provide an example of how doctors can give too much attention to EHRs rather than their patient, 3.) demonstrate that analog health records (paper charts) also subtract the doctor's attention from patients, 4.) show how silence caused by a physician's attention to health records can be marked as problematic in the contexts of Western (US) norms of silence, 5.) discuss how these interactions conflict with PCC practices.

3.1 Challenging Attention

Past scholarship has well discussed physicians' use of EHRs in the exam room and the effects they can have on the interaction (Makoul, Curry, & Tang, 2001; Ventres, Kooienga, & Marlin, 2006; Ventres & Frankel, 2010; Nusbaum, 2011). I start here with an example from the '03-'04 data set to show, in discursive and embodied detail, how a doctor's attention towards EHRs can affect the interaction. For this first extract I discuss the problem presentation and data gathering phases of the exam before any physical examination start.[11] I have chosen to show this extract at length to discuss multiple ways EHRs can effect the interaction.

Extract 1 - MC 20-9

01 PAT: Hi.
02 DOC: Good mornin'.
03 3.0 ((Door Closes))
04 DOC: Well what's up tihday?

[11] For a discussion on the phase structure of primary care visits see Heritage and Clayman (2010)

(0.2)
PAT: Well, I need somethin'=for that back and arm pain.
DOC: Okay.
(0.7)
PAT: And uh (that same-) my toes (are still dian) going numb on this foot. Um, what that's from. But it th- this leg is partially (.) numb anyway, remember from back surgery.=
DOC: (Your) Back.
PAT: So I don't know if that moved down there or not.=But sometimes It's annoying.
DOC: Okay. So you're having some problems with your back (0.2) your arm, your le[g and where else,
PAT: [Well it's across here.=
DOC: =(Ka[y.)
PAT: [And down he:re. They took eh- x rays I think [uh Doctor
DOC: [Mm.
PAT: Stout did.
(1.3)
PAT: Sep- And somebody else (Del) Mark, he sent me for x-rays. But She took- gave me the CAT scan.
(1.0)((Doctor pulls out keyboard tray))
DOC: O[kay.
PAT: [And she said I evidently had a mini stroke. Which (.) °I Don't really remember havin[g.
DOC: [Grea:t. ((sniff)) Okay,=
PAT: =Didn't know it.
DOC: Did you have any other things that you need to talk about today.before we get into that further?
(1.0)
DOC: Cuz I'll be able to look in here and see (if you) have anything in here on that mini stroke (.) question. (.) Anything else goin' on?
(0.3)
PAT: No.
(0.5)
PAT: Miserable.
(0.6)
DOC: Really,
(0.2)
DOC: When'd you see Doctor Stout last.
PAT: A:h, couple weeks ago.
DOC: Mmkay.
DOC; I'm going (get you something) from the Internet.
PAT: (Maybe it was a week ago) It has not been long.
(1.0)
PAT: Unhappy. (.) Just miserable.

51 (4.0) ((Doctor logs into the computer and starts browsing))
52 PAT: Course I guess there's a lot of that going around, huh?
53 DOC: MYeah. Some people are starting to feel better because it's
54 DOC: spring.
55 (0.7)
56 PAT: I shou:ld, but I'm no:t.
57 (6.0)
58 DOC: Alright, yeah she did send me something.
59 (8.0)
60 DOC: ( )
61 (8.0)
62 DOC: Mild to moderate (illarg stinosis.)
63 (0.3)
64 PAT: What that mean?
65 (1.0)
66 DOC: Means you have very minimal ((sniff)) narrowing of your aortic
67 valve.
68 (3.0)
69 DOC: You have mild LVH, left ventricular (perchaby) means the muscles
70 in your ventricle are a little thick.
71 ((Sniff))
72 The (ejection) fraction is normal.
73 (18.0)

The physician starts this interaction by entering the room, greeting the patient, asking "Well what's up tihday?," and sitting down right in front of the computer without interacting with it (lines 1-4). The patient then expresses her concerns and the reason for her visit (lines 6-17). She then mentions previous x-ray and CAT scan test performed for other doctors that detected a possible mini stroke (lines 19-24). Upon the patient's mentioning of the CAT scan the doctor can be observed trying to switch into the data gathering phase of the exam. This move can be noted in the doctor's embodied action of reaching for the keyboard (line 25; Figure 2), and his shift-implicative utterance "okay" (Jefferson, 1981; Beach, 1993) followed by the question about addition concerns (lines 31-32), and his statement that he will be able to look up any information relating to her mini stroke within the computer (lines 34-35). Although the patient initially states "No"

FIGURE 2 - PHYSICIAN REACHES FOR KEYBOARD

(line 38) to any additional concerns she quickly changes her stance with her utterance "Miserable" (line 40) and continues to expresses additional problems about her mental wellbeing (lines 40,50,52, and 56). Instead of directly addressing the patient's presentation of additional problems the doctor employs the pseudo-acknowledgment of "Really" (line 42). I classify this utterance as a pseudo-acknowledgment because unlike physician's acknowledgments, such as "mmh hmh," "okay," and "I see" that invite patients to continue presenting information (Frankel, 1984), the doctor's agenda is not to have the patient continue. This is noticeable when the doctor ignores the patient's concern of mental wellbeing by returning to his own medical agenda regarding the patient's last visit with Dr. Stout (Line 44). Thus, acknowledgments might be classified as pseudo when the

subsequent utterances break the expected adjacency pair structure by not addressing the patient's talk.

Another similar instance happens again with the patient reissuing of her 'mental' concerns (Lines 50), which is not at first acknowledge by the doctor but is instead followed by four-seconds of silence as the doctor signs into the computer (Line 51). After the silence the patient downgrades her mental wellbeing from a personal issue to a common issue shared by others (Line 52). Only then does doctor finally respond with an acknowledgment and reaffirmation of her downgrade — but not her initial expression of concern. Lastly, the doctor then vocalizes that Dr. Stout did forward him the results of the previous testing (lines 58 & 62) and starts to read aloud a few of the findings (lines 62, 66-72). I end the excerpt here, however from this point, the exam continues for another 12 minutes.[12] During this time the doctor never responds to the patient's expression of 'mental' concerns even though she continues to express them, "What am I a basket case? I need- put away, or." (line 108 Appendix C).

In the part of the interaction observed above, it can be observed how quickly some doctors move to using EHRs and how they can be used as a source of information instead of the patient. EHRs may be favored as resources of information over patients for a couple of reasons. First, the patient may not have, or be able to easily communicate, the necessary information to the doctor. Secondly, the physician favors information from the EHR rather than his patient. In this interaction the latter preference could be argued. From the very beginning of the interaction the physician locates himself right in front of the computer, not the patient, almost preparing for future use of the EHR. Furthermore, the physician moves

[12] For further discussion on this interaction see Good (forthcoming).

towards the computer after the patient mentions past medical tests, rather then asking his patients about the test results (line 25).

According to Ventres et al. (2005) actions like this are not the direct result of the EHRs in the exam room, but the practice style of the physician. In their study the authors' identify three types of practice styles related to EHRs use: informational, interpersonal, and managerial. Informational physicians are guided by their attention to gathering information, and spend a majority of the visit with the EHR checking the patient's history, making notes, or ordering test and prescriptions. Interpersonal physicians were found to direct most of their attention to the patient, and typically only used the EHR towards the end of the visit to type prescriptions, referrals, and letters. Managerial physicians balanced their attention between the patient and EHR often alternating between the two.

Based on the findings of Ventres et al. (2005), the physician in this extract can be classified with an informational style. This is further supported by the authors' notes that informational doctors frequently talk while gazing at the EHR, and uses the EHR to change topics. In the extract above it can be noted how the doctor switches his attention to the EHR to switch into a data-collecting phase. Furthermore, within this interaction the doctor rarely broke his gaze from the computer. (Figure 3) From the moment he logs in (line 51) he only breaks his gaze once in five minute, then, only moving away to physically examine the patient.

With the amount of scholarship dedicated to how EHRs affect doctor-patient interactions [13] it is important to remember that the physician's practice style will effect how

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[13] See Makoul, Curry, & Tang, 2001; Ventres, Kooienga, & Marlin, 2006; Ventres & Frankel, 2010; Nusbaum, 2011

s/he will use the EHR (Ventres et al., 2005). Moreover, it is also important to note that the doctor's practice style does not only affect his/her use of EHRs but also analog (paper) health records (Quill, 1995). For example, the physician in the data used next uses an analog chart instead of a EHR.

FIGURE 3 - THE DOCTOR'S FIXED GAZE

3.2 Silence and Health Records

In the previous extract multiple moments of silence can be observed throughout the interaction, at a time reaching up to 18 seconds.[14] At this point three notes should be mentioned about the doctor's behavior: 1.) Health records, electronic or not, are an important resource for the doctor. 2.) As part of the doctor's responsibilities s/he will need to refer to, make notes in, or update the patient's medical record. 3.) Silence is not always

[14] Within the same interaction the longest period of silence was 57 seconds.

inherently bad or problematic. For example, Goodwin (2003) and Wilkinson et al. (2011) discuss how 'abnormal' communication situations, characterized by drawn out exchanges or silence within turns-in-talk, can be contextualized as 'normal' in interactions with people with communication disorders, such as aphasia and dysarthria.

Furthermore, Jefferson (1989) provides explanation for silence occurring in interaction where participants do not suffer from communications disorders. In this article Jefferson examines a 6.5 and 16.4 second segment of silence in an interaction of two secretaries looking over a train schedule on a coffee break. Jefferson states, "In the coffee break materials of Fragment 2.1 the long silences may well be unproblematically occupied by one or another of the women looking at the train schedule" (p. 178). For Jefferson, this interaction is unproblematic because the train schedule provides an object in the interaction for the participants to jointly orient their selves to for the common task of selecting a train. Although Jefferson's reading may be correct, this section will examine when doctor's orientation towards EHRs does create extended periods of silence that are marked as problematic by the patient. This analysis will examine these occurrences in relation to Jefferson's (1989) analysis and Western norms on silence.

Using a statistical approach, Jefferson (1989) approximates a 'standard maximum' of naturally occurring silence in Western interaction around .9-1.2 seconds in length. She claims that beyond this 'tolerance interval,' silence may be experienced as problematic and participants might shift activities to end or fill the silence. However, as it was noted above, Jefferson also concludes that some silence may not be seen as problematic if its existence is understood in relation to the tasks of the interaction — such as looking at a train schedule. Therefore, from these contrasting findings it could be understood that the problematic

nature of silence is depended on the type of interaction and the participants' understanding of the tasks of the interaction.

If this is true, what can be learned from the following interaction between a doctor and her patient?:

Extract 2 – MC 6-10

((After listening to the patient's story of hurting her foot by falling in a pool the doctor starts to examine the patient's foot))

DOC: =Right and what we're going to do is make sure there's not a compression fracture.=
PAT: =>Okay.<=
DOC: =So we will send you down for an x-ray.=
PAT: =Okay.
(2.0)
PAT: And I have a pinched nerve in my back so I don't know if that's what's did it. But since (.) I mean this last week since I've hurt my toes=
DOC: =Mmhmm.((Slides back towards desk))
PAT: Those toes have been tingling a lot more than:: than:: normal. I I mean [than usual.=Cause my feet go to sleep [anyways with my-=
DOC: [Well [Mmhmm
PAT: =the [pinch nerve in my back. [(.) But usually its only when-=
DOC: [Mmhmm [Yes ((Starts writing in patient's file))
PAT: =when part of my foot is sitting on the ground. But- (.) its like I said the toes on that foot have been tingling a lot more this last week so:: (.) I didn't know if that had anything to do with my- twisting my foot or::=
DOC: =Well we'll see
PAT: hh. Ju(hh)st le(hh)tting you know.
(10.0)((Doctor writing in patient's file while patient watches))
PAT: I guess- I was telling your nurse that at least I fell in the pool with the water so at least it was(hh)n't a h(hh)ard la(hh)nding. I didn't hurt my back or anything. That's good.
(1.0)
PAT: My foot just wanted to stay up on the side of the po(hh)ol. [hah= the re(hh)st of m(hh)e: went in ha [hh ha
DOC: [^Mmhmm [O::ka::y.
(14.0)((Doctor writing in patient's file while patient gazes at doctor))
DOC: Al:ri:ght you get to take this [to the x-ray department
PAT: [Okay
DOC: ((Hands patient a form))
PAT: Mmhmm

86 DOC: And when you come back I'll have your prescriptions written and
87 we'll see what we're gonna do.
88 PAT: Okay.

This extract, starts with a series of institutionalized tasks being performed by the participants. First, the doctor examines the patient in regard to the patient's expressed concerns. Following the initial examination (Figure 4) the doctor suggest further examination in the form of an x-ray (line 54). The patient acknowledges and accepts the doctor's suggestion (line 55). Next, the patient starts to express a concern that a past injury could be complicated by the new injury (lines 57-59, 61-62, 64, 66-69). During the patient's talk the doctor starts the task of making notes and filling out forms for further examination (line 65; Figure 5). In addition to this activity the doctor offers acknowledgments of the patient's talk, but never addresses the previous injury directly. Instead, she reaffirms the purpose of getting x-rays taken with, "Well we'll see" (line 70). The patient concludes this series of talk with a statement of the purpose of her utterances (line 71).

Up until this point in the interaction (lines 51-71) the only silence was a 2.0 second pause (line 56). Considering Jefferson's 'tolerance interval' this pause may have been experienced as problematic by the patient, therefore, prompting her into the talk of her prior injury. However, the patient's additional expression of concern can be expected within the setting of the exam, and the pause my have only provided the patient space to launch into the talk about the prior injury. Considering these two alternatives, a conclusive reading regarding the problematic nature of the silence is hard to determine. However, the silence in line 73 provides a potential example of problematic silence.

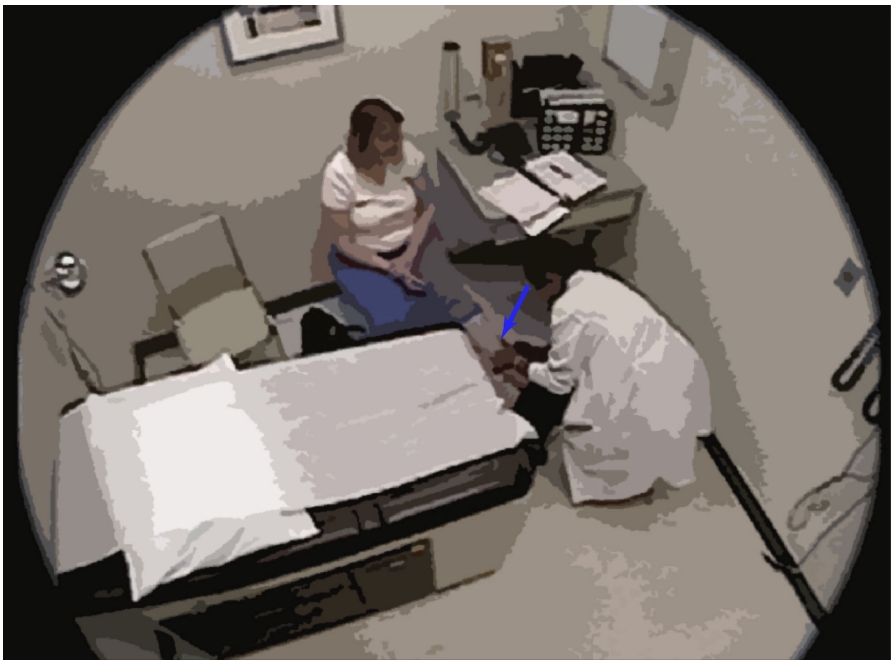

FIGURE 4 - PHYSICIAN EXAMINING THE PATIENT

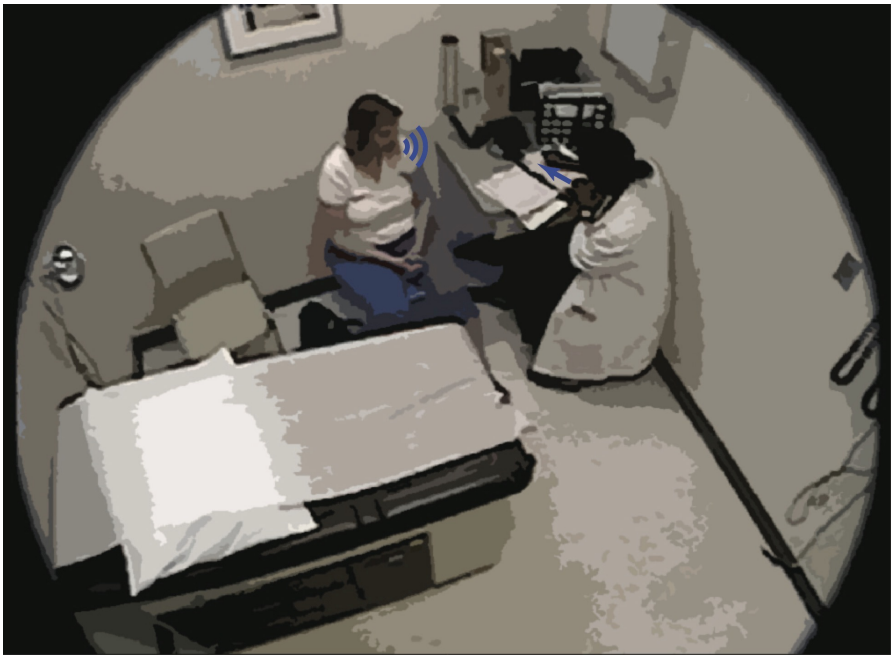

FIGURE 5 - PHYSICIAN MAKING NOTES WHILE PATIENT SPEAKS

Extract 2 – MC 6-10

73		(10.0)((Doctor writing in patient's file while patient watches))
74	PAT:	I guess- I was telling your nurse that at least I fell in the
75		pool with the water so at least it was(hh)n't a h(hh)ard
76		la(hh)nding. I didn't hurt my back or anything. That's good.
77		(1.0)
78	PAT:	My foot just wanted to stay up on the side of the po(hh)ol.
79		[hah= the re(hh)st of m(hh)e: went in ha [hh ha
80	DOC:	[^Mmhmm [O::ka::y.
81		(14.0)((Doctor writing in patient's file while patient gazes at doctor))
82	DOC:	Al:ri:ght you get to take this [to the x-ray department
83	PAT:	[Okay
84	DOC:	((Hands patient a form))
85	PAT:	Mmhmm
86	DOC:	And when you come back I'll have your prescriptions written and
87		we'll see what we're gonna do.
88	PAT:	Okay.

As stated, the doctor starts to write notes in the patient's file while the patient is describing the previous injury. Upon the conclusion of the patient's talk there is 10.0 seconds of silence as the doctor continues to write in the patient's file. Similar to Jefferson's example of the secretaries examining the train schedule, the doctor's actions of writing in the file should be considered a necessary part of the interaction. However, the patient's shift in activity away from silence in line 73 potentially marks the silence as problematic. Unlike the patient's previous talk describing the past injury, this talk offers no new or relevant information to the interaction. Instead, the patient only reports on an interaction between her and the nurse in which she narrates the events that caused the injury (lines 74-79), the same events that she had presented to the doctor prior in the interaction. In response to the patient's report, the doctor only offers two acknowledgments (line 80) while she continues to write in the file for another 14.0 seconds (line 81). The doctor concludes the interaction by presenting the patient with forms to take the radiologist, and discussing what will happen when they reconvene (lines 82-87).

Using the proposition that the problematic nature of silence is depended on the type of interaction and the participants' understanding of the tasks of the interaction, it could be argued that the patient did not fully understand the necessary tasks involved within the interaction, including the doctor's actions of writing in the patient's file. A potential cause of the misunderstanding is the asymmetry of knowledge between the patient and doctor in regard to the necessary tasks in the interaction (Heritage & Clayman, 2010). Furthermore, considering the asymmetry of knowledge, the three notes previously made about the doctor's use of the computer needs the following amendment: the doctor's use of health records and the resulting silence is not inherently problematic, nevertheless it maybe rendered as such by the patient.

Because of interactions like this many scholars and organizations (Ventres, Kooienga, & Marlin, 2006; Ventres & Frankel, 2010; AMA, 2014) have issued what they consider best practices with health records. One recommendation is for the doctor to inform the patient of their actions and purpose (Ventres, Kooienga, & Marlin, 2006). By simply stating upfront their actions or narrating their progress doctors can continue to provide attention to the patient and possibly avoid silence being marked as problematic. The following short extract by a third doctor provides an example of what this interaction could look like.

Extract 3 - MC 17-2

((After recommending ordering a blood test and x-ray the doctor turns away from the patient and towards the computer))

272 DOC: I'm just gonna go 'head an order a couple blood
273 tests an' thee x ray then
274 PAT: hh
275 (29.0)
276 DOC: An' (now) let me look here an' see what kind of
277 blood tests we've done in thuh past here

278 (xx)[15]
279 DOC: An' let me also order an x ray we can do all
280 these today
281 PAT: Alright
282 (x)
283 DOC: I don't see that you've had an x ray in quite a
284 long time is that right

As the doctor turns back to the computer he informs the patient of his actions (Lines 272-3; Figure 6). Which is followed by an out breath by the patient (Line 274) and 29 seconds of silence (Line 275). As the doctor continues to work on the computer he updates the patient on his progress (Lines 276-7, 279-80). Unlike the interaction of Extract 2, this patient does not attempt to break the silence as the doctor works with the health record. Therefore, it is plausible that she understood the doctor's attention to the tasks of the interaction, and consequentially did not note the doctor's silence as problematic. Within the last two extracts it is also possible that the idiosyncrasies of the patient, related to personality or culture, may have had an effect on the outcome of this interaction.

According to Johannesen, (1974) in Western culture silence is often viewed as worthless or asocial if not antisocial. Even with this generalization Johannesen elaborates that silence in interaction holds multiple meanings (see also Jefferson, 1989). From his list three are useful here: One, the person lacks sufficient information to talk on the subject. Two, the person is avoiding discussion of a controversial or sensitive issue out of fear. Three, the person is daydreaming or preoccupied with other matters. By returning to a part of the first extract, these three meanings of silence can be used to explain the doctor's use of the EHR and resulting utterances.

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[15] Video recording terminates so exact time of silence cannot be attained.

FIGURE 6 - DOCTOR USING COMPUTER

Extract 4 - MC 20-9

DOC: Did you have any other things that you need to talk about today.before we get into that further?
(1.0)
DOC: Cuz I'll be able to look in here and see (if you) have anything in here on that mini stroke (.) question. (.) Anything else goin' on?
(0.3)
PAT: No.
(0.5)
PAT: Miserable.
(0.6)
DOC: Really,
(0.2)
DOC: When'd you see Doctor Stout last.
PAT: A:h, couple weeks ago.
DOC: Mmkay.
DOC; I'm going ( ) or not.
PAT: (Maybe it was a week ago) It has not been long.
(1.0)
PAT: Unhappy. (.) Just miserable.
(4.0) ((Doctor logs into the computer and starts browsing))

52 PAT: Course I guess there's a lot of that going around, huh?
53 DOC: MYeah. Some people are starting to feel better because it's
54 DOC: spring.
55 (0.7)
56 PAT: I shou:ld, but I'm no:t.
57 (6.0)
58 DOC: Alright, yeah she did send me something.

This section of the interaction starts with the doctor noting that he does not have information on the patient's mini stroke but can look it up in the computer (line 34-5). Following this utterance the patient expresses additional emotional concerns (line 40). As previously discussed the doctor virtually ignores her emotional state to return to his own agenda, asking when the patient saw Doctor Stout last (line 44). After the patient's response to the question (lines 45, 48) she reiterates that she is feeling depressed (line 50). The doctor again ignores the patient's emotional state and logs into the computer (line 51).

Throughout this section of interaction, the doctor's decision to neglect the patient's expression of concern about her mental wellbeing (lines 44&58) can be related to the three mentioned meanings of silence. The doctor may be silent on the patient's expression of depression because he is focused on his own agenda concerning gathering information about the patient's biomedical history. In both cases the silence in line 57 can be related to the third point of silence as the doctor is preoccupied with the computer. Between the two scenarios the latter can be linked to the second meaning of silence, the person is avoiding discussion of a controversial or sensitive issue out of fear. However, for this instance this statement should be amended to expand beyond the reasoning of fear.

According to Beach et al. (2005), in a study examining patients' disclosure of fear and doctors' responses in oncology clinics, there is "a tendency for doctors to provide neither reassurance nor commentary on patients' contributions, essentially working to

close down and move away from patients' emotional concern" (p.906). The reason for this move away from the emotional is not necessarily from fear, but as some scholars have noted as a way of holding to a biomedical frame. This point may reinforce the scenario that the doctor is not improperly trained to handle emotional concerns, but that he is holding to his own agenda, which favors a biomedical frame. By holding to a biomedical frame and ignoring the psychosocial elements the physician is excluding factors that are essential to the biopsychosocial tenet of PCC. A little later I discuss, how silence, pseudo-acknowledgments, and other actions can conflict with the five tenets of patient-centered care as discussed in Chapter One. However, first I move to discuss the embodied actions of the participants.

3.3 Embodied Interaction

Thus far this analysis has largely focused on discursive action of doctors and patients as a result of the doctor's attention to the patient's health record. LSI also provides different theoretical frameworks to address the embodied interaction of the participants. During interactions between the doctors and patients, the participants' orientation towards each other and objects within the environment will change as the current tasks change. For example, while physically examining a patient, the doctor's orientation and gaze is towards the patient and possibly towards a specific part of the patient. Goodwin (2000) refers to such areas of focus as *s*emiotic fields, or diverse media fields of sign phenomena. Furthermore, he classifies a group of semiotic fields that a person orients to as a contextual configuration. Together Goodwin states, "As action unfolds, new semiotic fields can be added, while others are no longer relevant, with the effect that the contextual

configurations which frame, make visible, and constitute the actions of the moment undergo a continuous process of change" (p.1490). As participants change their orientation towards specific semiotic fields, thus altering the contextual configuration, they might also embody a shift in the ecological huddle, or arrangements between the participants bodies. Goffman (1964) states that ecological huddles "publicly demonstrates through visible embodied practice that the participants are mutually oriented towards each other and frequently towards particular places, objects, and events in the surrounding environment" (p.64). Together these concepts start to provide a framework to discuss the physical embodied actions of the participants.

Within the corpus of data examined numerous semiotic fields (e.g., patient's body and health records) are present and demand attention. Attention to these fields cause changes in the contextual configuration and ecological huddle. Below are some common orientations observed in the data, and some of their implications on the interaction.

FIGURE 7 - ECOLOGICAL HUDDLES

First, it should be noted that within the third and forth arrangement that the doctor at times has his back towards the patient. Although, this is not necessarily bad, it does completely change the doctor's orientation away from the patient, and as Goodwin (2000) notes, this could mark the patient as no longer relevant to the interaction. Furthermore, within the first two arrangements the angle of change between the health record and patient is acute and does not take much effort on behalf of the doctor to switch in between the two contextual configurations. Thus allowing the doctor to quickly change his or her attention back to the patient, and by doing so keeping them engaged and relevant. The opposite is noticeable in the third and forth arrangement as the doctor has to fully reorient their body to address the patient. Therefore, considering the work needed to switch orientations, the first two arrangements are preferable. However, if we consider the discussions above where the patient is informed of the doctor's actions, arrangements two, three, and four allow the patient to oversee the doctor's interaction with the health record. These arrangements, in relation to the third tenet of PCC (i.e., sharing power and responsibility*),* present the patient with more power within the interaction. Considering the third tenet again, image 4 of the second arrangement is especially noteworthy. In this interaction the patient's position and proximity to the physician in the ecological huddle has allowed the patient to reach over and point to a medicine listed in her chart that she needs refilled. Therefore, if an arrangement were to be selected as the preferred choice, arrangement two offers the least amount of work needed to switch between configurations, and it grants the patient a more equal position in the interaction.

Although the second ecological huddle between the doctor-patient-chart is productive by allowing the patient to interact with the medical record, the patient must

turn her body to do so. The patient could better participate in the interaction if she was oriented facing the chart with the doctor. (Figure 8) Goodwin (2007) proposes that ecological huddles such as this create a triadic framework ideal for joint attention to objects in the environment. Goodwin further discusses that joint attention frameworks like this are important to the processes of education and apprenticeship, in which a master is able to easily present information to and monitor the reception of the apprentice. In the contexts of PCC practices, a joint attention frameworks create a more positionally balanced space for physicians and patients to share and discuss information easily, thus strengthening the therapeutic relationship between the participants. Furthermore, to draw back to Jefferson's (1989) example of two secretaries looking over a train schedule, a joint attention framework could potentially reduce the probability that a patient might mark silence, and thus the interaction, as problematic. As I will now conclude this chapter, when interactions are marked as problematic, they often conflict with the tenets of PCC.

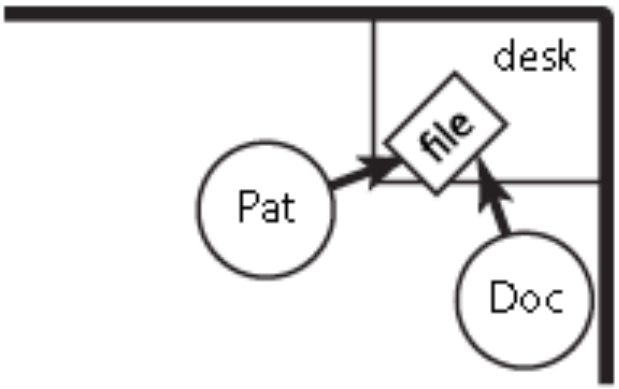

FIGURE 8 - PATIENT ORIENTED TOWARDS CHART WITH THE DOCTOR

3.4 How attention to EHRs can interfere with PCC practices

In this chapter I have presented examples of how doctors use health records during exams with patients, and how the use can be marked as problematic by the patient. I now argue that these occurrences are the results of actions and utterances that complicate efforts towards patient-centered care.

By returning to the first extract again (p. 30-1) it can be observed how doctor's actions concerning EHRs can conflict with practices of PCC. In this extract the doctor's pseudo-acknowledgments neglects the patient's expression of emotional concerns. Instead of addressing the presented concerns the doctor clings to a biomedical agenda focused on the test results from Dr. Stout (line 44, p30). Therefore, the doctor can be viewed as not following the biopsychosocial approach of patient-centered care. Furthermore, by neglecting the psychosocial component of patient-centered care it is difficult for the doctor to discover how the patient's issues affect their personal life, or patient-as-person, unless the patient offers it on their own. For example, because of the pain in her back the patient identifies herself as "the crippled one" within her group of friends — who at times must help her put on her coat (Appendix C, MC 20-9, lines 97-8). In respects to the tenets of PCC such patient talk should not be treated as anecdotal, but as an opportunity to understand how the biomedical affects the psychosocial. However, the pseudo-acknowledgments from the doctor treats the talk of the patient as not important.

Similarly, in Extract 2 the doctor does not indulge the patient's talk about how the new injuries may be exacerbating past injuries (Lines 57-9,61-2,64,67-70; p 34-5). Instead of discussing this talk in detail, the doctor offers a few pseudo-acknowledgments before she

reaffirms a medical authority by restating they will have the needed answers after the x-ray (Line 71). This selection of talk is then followed by 10 seconds of silences (Line 73), which as it was discussed is marked as problematic by the patient because of a potential asymmetry in knowledge between the doctor and patient.

In both of these extracts the doctors appear to be performing acts and utterances that go against efforts of patient-centered care. Because of this the therapeutic alliance between the doctor and patient can be strained. In order to attain a proper therapeutic relationship between the doctor and patient, the patient must perceive the doctor as caring, sensitive, and sympathetic (Bordin, 1979; Squier, 1990). Therefore, the doctor should acknowledge and discuss patient's expression of emotional aspects and lay diagnosis.

When the doctor sticks to a biomedical agenda, he or she does not encourage the patient to view him or her as a subjective human being within the interaction. Instead, the doctor only fulfills the tasks that any equally competent doctor should be able to complete, thus removing the doctor's personal identity within the interaction and only treating them as a medical professional.

In order to promote a more balanced relationship, there can be numerous ways that a doctor can share the power and responsibility with the patient. They can allow the patient to discuss and weigh in on treatment options or they can simply provide an opportunity for a patient to express what they believe is going on through a lay diagnosis. Ultimately the doctor does hold the medical knowledge needed to solve the patients ailments, but in efforts of PCC they should attempt to include the patient in these decision and acknowledge contributions that the patient offers.

Chapter 4 - Potential Design Directions

In this chapter I will explore, conceptualize, and discuss, potential designs of how to incorporate EHRs into exam rooms based on effective communication and engagement between patients and physicians, and patient-centered care practices. It is the goal of this thesis to improve the usability and efficiency of EHRs for doctors, to advocate for patients to have direct access to their care records, and to improve the experience of all of the participants. As discussed in the first chapter, I have conceptualized this thesis through an industrial and interaction design process informed by a language and social interaction analysis presented in Chapter Three. I start this process by first defining the scope of project and my approach to the problems. I will then discuss some research and identified opportunities. Finally, I will present my concepts and an illustrative narrative to show one potential new interaction with my concepts in use.

4.1 Scope of work

As mentioned previously, I align this work as a response to the American Medical Association's (2014a) call for a design overhaul of EHRs. Within this call the AMA advocates for eight priorities to improve EHRs:

- Enhance physicians' ability to provide high-quality patient care
- Support team-based care
- Promote care coordination
- Offer product modularity and configurability
- Reduce cognitive workload
- Promote data liquidity

- Facilitate digital and mobile patient engagement
- Expedite user input into product design and post-implementation feedback

Although each of these points are important aspects of EHRs that need to be addressed, it is well beyond my abilities and scope of this work to propose concepts to fully overhaul of a system as large and complex as EHRs and the healthcare system. For this reason I will only address sections of these priorities, which I will discuss in relation to my proposed concepts, in the conclusion of this chapter.

Furthermore, although EHRs are used throughout the healthcare system, I specifically focus my attention to EHRs in the exam room. This decision is based on a number of factors including: The IDC (2013) report that a major of physicians are dissatisfied with EHRs due to their negative effects on productivity while seeing patients, the use of EHR can sometimes lead to discursive and embodied actions which conflict with PCC practices, and even though the exam room is one space within a very large network of people, private policies, and laws, the exam room provides a single interactional stage to study. Moreover, to fit within the scope of this project I must start with some basic components of the current system and reimagine how they are constructed and used. For example, to fully redesign the exam room would require redesigning each piece of equipment, if that piece of equipment was even still needed. Instead I will attempt to optimize what is currently in place, while reimagining how EHRs are used and incorporated into the space.

Lastly, I will also focus my attention on the physical components of EHRs and how and when they are used, not the digital user interfaces. Although multiple sources (IDC, 2013; AMA, 2014b; Physician 1, personal communication, 3.19.15) have discussed major

issues with the digital interfaces of EHRs, I focus my attention on the physical and interactional components of EHRs for two reasons: One, I do not practice digital user interface design, I do not have the ability to test current systems, and more importantly I believe there is an opportunity to take a step back and reimagine EHRs not as information system accessed through a single screen, but as resource who's interfaces exists at multiple points of interaction between the doctor, patient, and exam room.

4.2 Approach

If you were to ask a group of people, designers or not, to draw a new computer mouse, you would probably end up with a lot of quasi-blobby, injection molded plastic objects that rest on a table with buttons and a sensor to track movement. Archetypes of form and practice so quickly become the ingrained norm that it is hard to conceptualize anything that does not share a resemblance. However, to take a step back and ask, "what is a computer mouse?" can open up the floor to expand beyond the typical expectations of the object.[16] At its primary level a computer mouse is not that piece of injection molded plastic, with a sensor, buttons, and maybe a bluetooth transmitter. It is not even that flat, rectangular touchpad that sits below the keyboard. A computer mouse is a way of interacting with a computer by extending the human hand and its gestures into a digital space. To start with this definition of a computer mouse helps move the concept of the device away from its archetype and open space for new possibilities. This does not mean that all new possibilities will be better than what there is now, but if you were to return to

[16] I would like to thank Cas Holman for encouraging her students to pause and take a step back to have room to be curious and ask even the simplest questions.

the same original group of people and ask them to create a new way to interact with a computer, I'm certain you would have drastically different results, and sometimes different can inspire greatness.

It is this with approach that I explore and conceptualize EHRs and the exam room. But before I step back it is important to understand what I am stepping back from. In Chapter One I briefly discussed both exam rooms and EHRs. To recap, the archetype of a primary care exam room has not changed beyond adopting new technology in the past few decades. The room will typically contain: an exam table, a writing surface and stool for the physician, a chair or two, a countertop with a sink, storage cabinets, hazard disposal containers, the doctors equipment, and wall charts and diagrams. Additionally, as EHRs started appearing in exam rooms, desktop computers began filling whatever flat work surface was available. As technology advanced so did EHRs; screens got flatter and more portable, and now doctors can be observed using tablets such as iPads. It is from these archetypes and current status of exam rooms and EHRs that I pause, and step back from.

I step back not because I believe these systems are totally wrong, as I will discuss there are elements that will need to stay, instead I step back because I believe there is an opportunity for innovation beyond trying to fix the current system of screens and digital interfaces by assuming the answer is different screens and digital interfaces. I start by asking if the current system was built with full consideration of the users and their interaction, or was it built on convenience and naturally evolved and adapted new technology because it was available. As mentioned in Chapter One, a lot of current EHRs systems were design around billing practices and incentive requirements, not the end users. As I step back I begin to ask: What is an exam room? What are electronic health

records? What are the activities involved with the interaction? Where, how and why is it necessary for the exam room, EHRs, and users to interact? By starting with these questions I do not aim to wipe the slate clean and to begin completely anew. As with the mouse example above, I start with the function and purpose of the current systems.

4.3 The function of the exam room and EHRs

By asking what is an exam room, or what are EHRs, I attempt to get at the basic properties that define them and make them different from other rooms and records. If any conceptual ideas put forth do not meet these basic properties then it is arguable that the concept would not properly function as an exam room or EHR. To question if the basic properties of current exam rooms and EHRs are right would be a meaningful study, but one that I do not explore now.

Revisiting the discussion from Chapter One, the exam room is the primary location where doctors interact with their patients. Each exam room is fitted with resources and equipment that may be needed during the interaction. Most activities that occur within the exam room can be broken into two sections, conversation about the patient's health and the physical exam. According to the Mayo Clinic (2006), and as observed in the data, doctor-patient interaction is primarily communicative, and some interactions never need a physical exam. Furthermore, interactions will vary between different patients or return visits. Because of this variety, the exam room must be flexible enough to cover a range of use, and also efficient to maximize productivity. All considered, the question, "What is an exam room?" can be answer as, a space that provides the necessary equipment for a doctor to successfully meet with and treat their patient.

Exploring the question, "What are EHRs?" entails a similar approach. As also stated in Chapter One, EHRs at their most basic level are seen as a digital version of the patient's medical chart and history containing the patient's: demographics, medical history, diagnoses, medication list, immunization dates, allergies, lab results, doctor notes, and billing data (HealthIT.gov, 2013a). From observations healthcare providers can be seen using EHRs to: set and view reminders for patient screenings, check or clarify information, retrieve data or test results, write orders for prescriptions or tests, take notes, and share information with patients. However, it is of course the networking abilities of EHRs that provides the most profound difference between EHRs and their analog counterparts. Prior to EHRs, health records and test results had to be copied and shared via other methods, such as mail, phone, or fax. Ideally now records can be request and received in the matter of seconds with a few simple clicks. Therefore, EHRs are truly a network of communication tools that facilitate the recording and sharing of health[17] information, in real time, between healthcare providers, other important personnel (e.g., pharmacists), the patient, or even themselves.

4.4 Exam Room and EHRs Regulations

When considering what an exam room is and what are EHRs it is important to consider additional factors that define their properties, especially official regulations sanctioned by legislation and institutional policy. For example, exam rooms must comply to a number of guidelines including the Americans with Disabilities Act 1990 (2010), Facility

[17] I use the word health here instead of medical to emphasize that the records should contain more than the patient's medical history and concerns, a summary of their overall health including psychosocial concerns. See also (Garrett & Seidman, 2011).

Guidelines Institute (2014), and Occupational Safety and Health Administration (2003). These guidelines not only regulate safety protocol but also the physical structure of the room. For example the FGI advocates at least a 100 square foot room, while the ADA stipulate wheelchair access guidelines that require at least a 60" diameter clear floor area for wheelchair turning.

Unlike exam rooms, EHRs regulations do not directly dictate their form but how they are used by healthcare providers. Physicians are required to use certified EHR technology to participate in meaningful use incentive programs (AMA, 2014b). Certification criteria is set by the Office of the National Coordinator for Health Information Technology as authorized by the Health Information Technology for Economic and Clinical Health (HITECH) Act (Office, 2014).

Although I have briefly reviewed available regulatory resources, I do not focus much on such guidelines for a number of reasons. 1.) To fully review the extensive amount of guidelines is well beyond my current scope, expertise, and resources. 2.) I do not believe my proposals are so far out of the norm to warrant an intensive review of the guidelines. I do acknowledge upfront the limitations and issues that follow with this perspective. 3.) I believe that ideation of new concepts can be stifled by restrictions, and although generated ideas may not pass the guidelines they can either be revised or useful to inspire new ideas.

4.5 Insights and Opportunities

At this point in my project I have conducted, reviewed, and analyzed a fair amount of research including: participant interviews, an analysis of video recorded doctor-patient interactions, reviews of current systems and products, and scholarly articles. Looking

through this gathered information certain observations can be made about the interactions. As these observations are synthesized specific insights start to emerge and give direction to potential opportunities for design. In this section I layout and discuss several insights which have influenced the direction and focus of my design work.

Insight 1: *Exam room seating and EHR placement limits participants' interactional flexibility.*

As discussed, exam rooms have been designed to accommodate the needs of different types of visits from consultations to full physical exams. Although the overall space of the room can support a variety of activity, individual components of the space, such as seating and placement for EHRs are often inflexible. I start by discussing seating then EHR placement.

In Chapter Three I discussed a few seating arrangements with particular focus on the second arrangement of Figure 7(p 42-46). In this orientation I noted that the patient must rotate her body and head to face the doctor and chart. The physician's stool allows the doctor to freely move about the space and orient her body to different focuses be it the patient or EHR. However, the patient's chair does not have wheels or a pivoting base, if she desired to rotate the chair she would have to either stand up and move the chair or quickly shift her body in the chair to jerk it along the floor. Both methods are cumbersome and not ideal. Static chairs like this are the norm in exam rooms, and can be observed in all collected data, discussions with interviewees, additional observations, and studies on exam room designs[18]. In a Mayo Clinic (2006) study researchers note that there is need for a chair that can adjust to accommodate the patient's size and strength. The researchers even go on

[18] See Mayo (2006); Midmark (2011); Steelcase (2013).

to state that “Chairs that provide ways of connecting with the physician or with family members could be of value” (p.12). However, their discussion and supporting drawings do not speak to how this could be done.

Opportunity 1: *Mobile patient chairs will provide participants with additional flexibility by giving patients equal mobility as the doctor. In turn this can improve eye contact, communication, and joint attention between participants.*

Like patient seating, EHR placement tends to be mostly static as well. Within Chapter Three’s data all physician can be observed using desktop computers on a desk. Of course this equipment is fixed in its placement and can cause orientation issues between the doctor and patient. These issues were discussed in Chapter Three, but were also noted by the physician during our interview. The physician explained that she used to use a laptop which she placed on her lap so she could face the patient and take notes. However, she recently moved her practice into a shared space with another practice and the information technology department for the building switched over EHRs devices to desktop so there would be a more secure connection to the server. She explained that the desktop limits her abilities and makes it harder to work between the EHR and her patient (Physician 1, personal communication, 3.19.15).

Although this physician has returned to desktops, many other physicians in recent years have adopted flat screens on movable arms, laptops, or tablets instead of desktop computers. Because laptops and tablets are portable, they have reduced the need to have a computer in each room since the doctor can carry it in. However, when the doctor carries in

the device there is often only one place to set it down (for examples see Figure 9). Once the device is in that position it more or less functions the same as a desktop computer, including capturing the doctor's attention similarly to what was discussed in Chapter Three. Furthermore, the form and touch screen features of laptops and tablets makes it difficult for physicians to share and navigate the EHR at the same time. As the physician turns the laptop or tablet towards the patient s/he also move the points of interaction (e.g., keyboard, mouse or touch screen) away from his/herself.

Another method of EHR placement has been wall-mounted screens on movable arms. This system has been praised for its ability to position a screen in front of patients to share information (Mayo, 2006; Ventres, Kooienga, & Marlin, 2006). However, this system like the other limits the use of EHRs to one area of the room and does not allow the doctor and patient to use EHRs unless they are currently in front of it or have returned to it. The extra movement required to return to the EHR can be awkward, inefficient, and may cause doctors to face away from the patient, which can be problematic as discussed in Chapter Three.

Mobile workstations, such as Pocket™ by Steelcase, do provide a solution to this problem by creating a moveable stand that a laptop or tablet could be rested on (Figure 10). However, if laptops and tablets are used they still have the same issues with sharing and navigating that were just mention. Additionally this mobile workstation is only meant to be used by the doctor and therefore does not contribute to providing equal access to patients.

Opportunity 2: *A mobile EHR station would allow physicians and patients to share, discuss, and update information easily anywhere in the exam room.*

FIGURE 9 - FIXED WORK SURFACES

FIGURE 10 - POCKET™ MOBILE WORK STATION (IMAGE CREDIT: STEELCASE)

Insight 2: *Patient involvement in and use of EHRs is extremely low.*

If the current EHR system has been designed with any user-centric design approach, the focus has all been directed at the doctor, not the patient. Patient interaction with their own EHR is extremely low if at all despite: the patient's legal rights to have access to their

record (HIPAA, 1996; HHS.gov, n.d.), PCC practices encouraging sharing responsibility with patient (Mead and Bower, 2000), advocacy for patient access (Shenkin and Warner, 1973), and studies that show improved communication between doctor and patients (Shenkin and Warner, 1973; Westin, 1977; Kirby, 1991; Carter, 1998; Ross & Lin, 2003; Roter and Hall, 2006), and benefits from patients participating in their own data collection (Bernabe-Ortiz et al, 2008; Ruland, Starren, & Vatne, 2008).[19]

Furthermore, EHRs-PCC best practice literature such as (Ventres, Kooienga, & Marlin, 2006) focus solely on the doctor's behaviors (e.g., sharing screens and informing patients of their actions), and do not discuss giving patients direct access to their own EHR. The only 'open' access that patients have to their EHR is provide through a website that they can view at home. Typically these web portals allow patients to view summaries of past visits, view lab results, view medication lists, book new appointments, and message the doctor. Although this could be considered a step in the right direction, online portals have not been accepted by all offices that use EHRs, and are not without additional issues. First, online portals are only readily available to patients who have easy internet access, thus making it harder for low socio-economic status families to participate in their health care (Institute for Alternative Futures, 2006; Fairlie, 2006). Second, even though online portals allow patients to message the doctor, only providing patient's access to their EHR at home misses opportunities to allow patients to discuss their record with their physician at the time they are viewing it. If a patient wishes to discuss their record with their physician in person they must remember to do so at their next visit.

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[19] The physician I interviewed also stated it was very important for patients to have access to and to be involved in their health record (Physician 1, personal communication 3.19.15).

Opportunity 3: *Patients could be given access to their EHR during the doctor visit to improve PCC practices by giving them more ownership in their care, and the ability to discuss the record with their doctor.*

Insight 3: *The activities leading up to the exam with the doctor can be inefficient and redundant.*[20]

To illustrate this next insight I start by offering the following brief personal story. Recently I started seeing a new doctor. Before my first visit I was mailed a questionnaire to gather my basic demographic information, medical history, and some other data. I was instructed to fill it out and bring it to the first appointment. Upon arriving I delivered the completed forms and my insurance card to the front desk and then waited in the waiting room for a few minutes. I was then called and escorted to the exam room by a nurse. The nurse began by asking me the same questions from the questionnaire and entering them into her iPad. I answered the questions again, and then provided my reason for visiting, which she also recorded. She then left and I waited a few more minutes. The doctored entered with his own iPad, we greeted and then he too asked me what my reason for the visit was.

Within this series of interactions what is most noticeable is the redundancy of information being requested by the healthcare providers. First, I was asked to fill out the

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[20] During the interview the physician explained more redundancies within the EHR system, such as billing and coding protocol (Physician 1, personal communication 3.19.15). Although these issues are inefficient as well, they are similar to the issues identified by the AMA (2014b) report, and are largely issues within the digital interface. I instead focus on redundancies that interface directly with the patient.

questionnaire before my visit, but then I was walked through it again by the nurse so she could record it in my EHR. The next redundancy happened between the nurse and the doctor when they both ask me why I have scheduled an appointment. Which I may note an additional level of redundancy of this question because I was referred to this doctor by another, who's office is one floor below, and the reason for my visit should have been noted in the referral. Nevertheless, having the nurse enter the answers to questions that I have to answer, and have already answered, was an inefficient use of her time. Furthermore, waiting time in both the waiting room and exam room can vary from a brief moment to minutes, and has historically been the time that patients would fill out forms before the advent of EHRs. Now this time is often passed by the patient sitting, reading a magazine, browsing their phone, or another activity.

Opportunity 3b: *Patients could be given access to their EHR during the waiting periods to verify and update information as well as enter their reason for their visit. In turn this would reduce the work load of support staff and nurses.*

Insight 4: *Doctor's use of EHRs can be viewed as problematic, yet EHRs are still a needed resource.*

As some scholars have noted[21] and as I discussed in Chapter Three, the doctor's attention towards EHRs and away from the patient can be problematic. However, as I stated, EHRs provide a valuable resource to the doctor and at times are used to retrieve or record

[21] See Makoul, Curry, & Tang, 2001; Ventres, Kooienga, & Marlin, 2006; Ventres & Frankel, 2010; Nusbaum, 2011

information while in the exam room with the patient. Best practices with EHRs recommend that physicians integrate use of EHRs around the patient's needs, tell the patient what they are doing as they do it, and use mobile monitors (Ventres, Kooienga, & Marlin, 2006). However, depending on the doctor's activity these recommendations may only be a way to distract or put the patient on hold. For example, in Extract 3 of Chapter Three, the doctor informs the patient that he is engaging with the computer to order some test and review some past work. Meanwhile the patient sits quietly on the exam table behind the doctor, unengaged in the activity.

Opportunity 4: *Patients could be given productive activities with or without the EHR to give a moment for the doctor to do his/her work.*

4.6 The Optimized Exam Room

Although, the major focus of this work are EHRs, I start by rearranging the exam room, for I argue that the arrangement of the exam room lays the foundation for how the EHR will be used within the interaction and how the participants will move about the space. Furthermore, a Midmark (2011) report on patient-centered design in exam rooms notes that redesigning the exam room to integrate consultation, counseling, and treatment together can have a great impact on the provided care since the exam room is where participants spend most of their time together. I strongly believe that there are additional opportunities to be had reimagining the exam room, and note some of the interesting work done by the Mayo Clinic (2006), Midmark (2011), and Steelcase (2013) on changing exam

room furniture and work flow. However, as discussed, I have limited my scope of this project to work with the current standard components of the exam room.

For now I offer the following exam room layout. I start with the standard components of the exam room before moving into my optimized changes. Points discussed here are based on common practice, interviews with patients, and observations both personal and from the collected data.

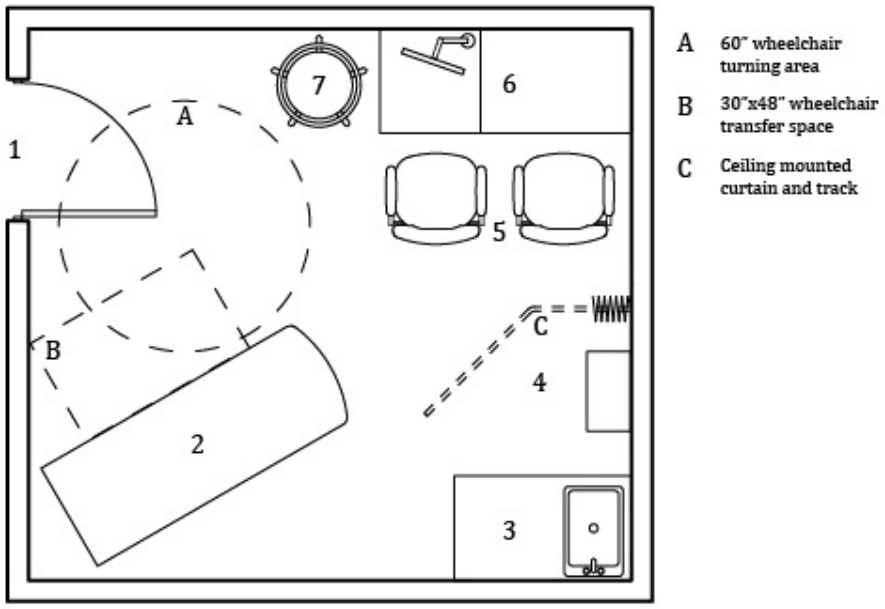

FIGURE 11 - PROPOSED FLOOR PLAN 12' X 11'[22]

(1) - The Door

The exam room door is reversed-hinged[23] to provide additional privacy to the

[22] Although the FGI (2014) advocated at least a 100 sq. ft. exam room this room is 132 sq. ft. to provide space ADA access guidelines.

[23] A standard hinged door will swing towards the wall.

interior of the room (Midmark, 2011). The door width is at least 32” to meet ADA guidelines of accessibility (ADA, 2010).

(2) - The Exam Table

The exam table is place at an angle in the corner behind the door. This placement serves multiple purposes. First, patients are not instantly greeted with the sight of the exam table when they enter. Second, not all exams require the exam table so it is removed as the focus of the space (Mayo, 2006). Third, the angle grants the physician ample access around the table and enough space to assist a patient in a wheelchair. Lastly, in combination with the reversed-hinged door, this position provides addition privacy to a patient on the exam table if someone opens the door during the exam.

(3) - Casework and Storage

The counter, sink, and hazard safety containers are located on the far wall near the exam table. This placement has been proposed for the following reasons: The proximity to the exam table provides easy access for the doctor to attain and dispose of any hazardous material. Like the exam table, it is not needed in every exam, therefore, placed out of the immediate focus of the room. Finally, it has been placed behind the patients (5) so they do not have to gaze at the medical equipment and hazard containers as they wait for the doctor.

(4) - Changing Area and Patient Storage

At the far end of the room away from the door should be a changing station with a

curtain and small storage area for the patient's belongings (e.g., purses, coats, clothing). From interviews conducted with patients, and noted by Steelcase (2013), one concern that was raised was a location to change and store personal belongs during an exam. Furthermore, at times it can be observed that some offices attempted to accommodate patients, but the efforts fall short (Figure 12).

FIGURE 12 - SIGN READS, "CLOTHES ONLY *NO PURSES OR COATS* THANK YOU"

(5) - Patient Seating

Patient seating should provide seating for the patient and at least one other person. It is important to have seating for another participant beyond the doctor and patient, because some patients may feel more comfortable with a family member or care taker present. Furthermore, patient chairs should have arm rests to help stabilize users as they get in and out of the chair. In response to the first opportunity identified above, chairs

should also have casters on each leg so the chair can be easily repositioned to the participants' desire. Wheeled patients chairs will provide patients and a guest mobility equal to that of the physician on the stool. If the patient in Extract 2 had a chair with wheels she could have more easily positioned herself within the ecological huddle to interact with her health record and the physician.

(6) - Communication Space

Communication between the doctor and patient is a vital and major part of the interaction. However, past exam rooms have been largely designed around the physical examination and not communication between the participants (Mayo, 2006). I view the entire exam room as communication space for the doctor and patient, but believe it is beneficial to have a specific space for participants to converse in comfort.

Having a location to comfortably speak to the doctor is of interest to some patients as well. During the interviews I conducted, two of the participants specifically commented on they did not like to sit on the exam table unless it was necessary. The interviewees stated that the exam table was both physically and emotionally uncomfortable[24]. Moreover, during the interview each participant was asked to imagine and sketch their ideal exam room. (see Appendix F) One common feature discussed among all three interviewees was seating arrangement. One of the more interesting idea was inspired by a kitchen island as a social gathering and conversing location (Figure 13). To support the interviewee's idea, the

[24] One interviewee described the experience of sitting on the exam table as dehumanizing because she felt the attention was on her body and illness and not on her as a person.

Mayo Clinic (2006) study found that doctor-patient dynamics improved when they sat next to each other rather than across from each other.

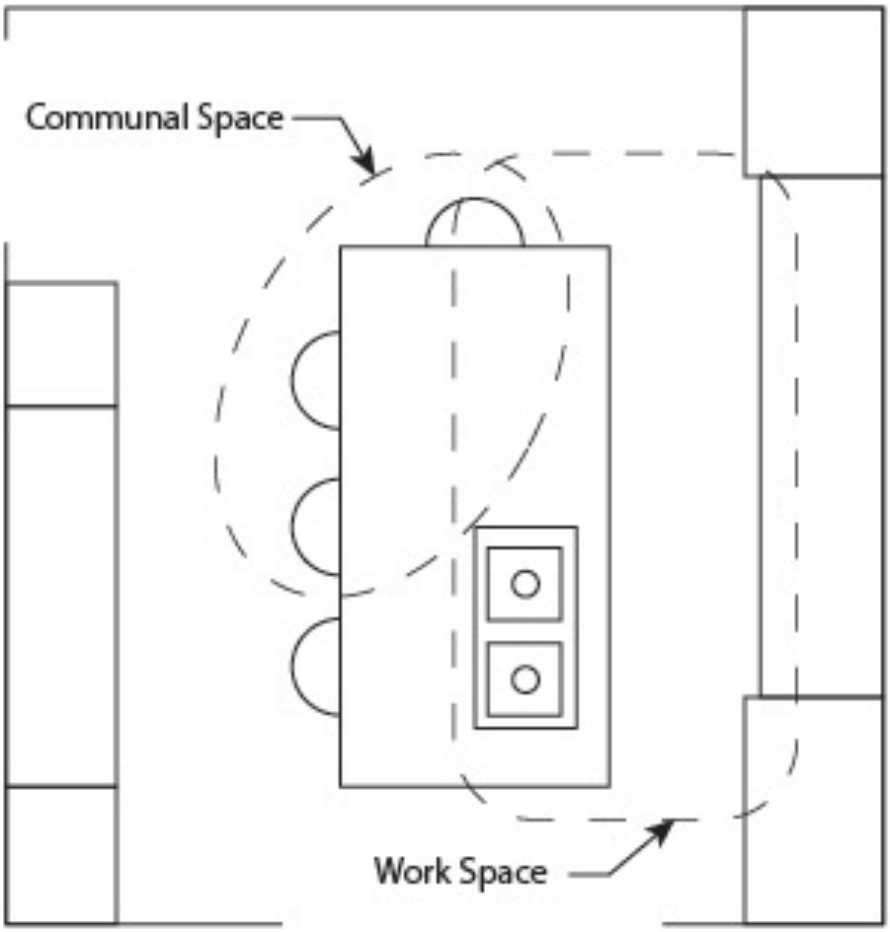

FIGURE 13 - INTERVIEWEE'S SKETCH OF HIS KITCHEN (SKETCH HAS BEEN REDRAWN FOR CLARITY)

I start by placing the communication space in the direct path of the doorway. This locates this area as the primary focus of the room and allows participants to easily navigate to the space without having to move around other furniture. It also places waiting patients as the first thing the doctor sees when s/he enters the room. The doctor can easily make

eye contact and greet the patient before moving ahead with the interaction. This space is also large enough to easily accommodate at least the physician, the patient, and one other.

Furthermore, this location is the primary site of the EHR. Since the interaction between the doctor and patient sometimes requires communication to other sources of information, the proximity of the EHR allows the participants to easily access outside information without having to transfer to another location in the room. By locating the EHR in front of all participants it allows for joint attention to any information being displayed. This area would also provide the space for patients to take notes and engage with their EHR device, as I will discuss more later.

However, not all exams can be completed only within this area; sometimes a physical exam is needed. When participants transfer to another part of the room and phase of the exam they should still have all the benefits of the communication space including easy access to the EHR. Therefore, as I will discuss more below, part of the communication space is mobile to move with the participants.

(7) - The Physician's Stool

The physician's stool is another common piece of exam room furniture. It is often a stool instead of a chair to give physicians the most maneuverability around the exam room. I place it on the door side of the communication space to allow the physician to sit without having to walk past the patient. This also places the doctor's back towards the door and not the patients so the participants can easily greet when the doctor enters.

4.7 Notes on EHR Ideation

Having explained the optimal starting arrangement of the exam room. I now move to discuss changes to EHRs and how I imagine them being incorporated into the space and social interaction. My concept uses a three piece EHR system within the exam room. However, before I get into each component I first wish to address some of the thoughts that led to this final concept.

I started by expanding on segments of the functional definition of EHRs that I discussed earlier to try to push me beyond the typical constructions of current EHRs (Figure 14). I considered moving beyond the conceptions of a screen-based computer interaction, to potentially remove the doctor's need to physically interact with the computer at all. With the advent of the Kinect voice and motion detection system by Microsoft, and the virtual personal assistance like Apple's Siri, the concept of a virtual medical assistant to record the doctor's notes and present information is not necessarily one of sci-fi. It has also be discussed how the EHR already acts as a third person within the exam room (Heath and Luff, 2000; Ventres, 2006; Good, forthcoming). Furthermore, such technology is already finding uses within medical practices. For example, a research team at Microsoft Research Cambridge worked with the Kinect technology on a project that would allow surgeons to control medical imaging technology only with hand gestures (Gantenbein, 2012).

Although such technology shows some promising applications to the healthcare industry I decided it would not suit EHRs for a couple of reasons. First, motioned based or large touch interfaces can cause fatigue on users, and it is not easily used by people with

mobility issues (Saffer, 2010[25]; Lu, Chen, Fan, & Chen, 2012). Second, according to McCormack (2014) over one-third of patients expressed they would be bothered by the doctor audio recording interactions. I decided having an omnipresent EHR system would probably be beyond many patients' comfort level. Furthermore, for privacy reasons users would still have to use a screen and touch interface outside of the exam room to interact with the EHR system. Therefore, although, I stated towards the beginning of this chapter that I step back to avoid replacing screens with screens and interfaces with interfaces, my concepts still uses screens. I, however, will discuss what these screens could be like, and how they could be used.

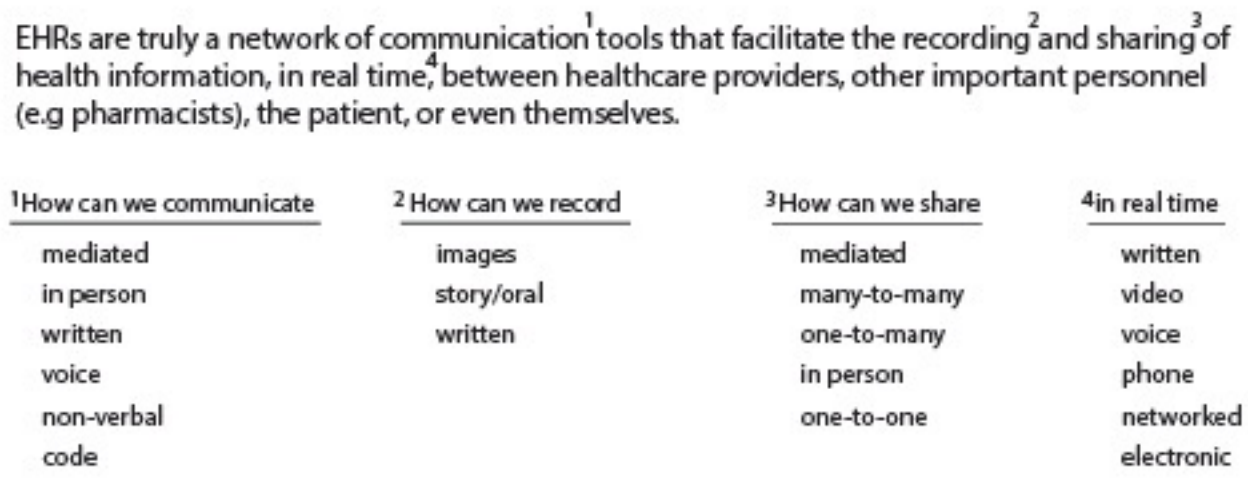

FIGURE 14 - EHR FUNCTIONAL DEFINITION EXPANSIONS

[25] Saffer discusses that while filming the *Minority Report* (2002), Tom Cruise had to take multiple breaks from fatigue because of the energy required interact with the large touch interface displayed in the movie.

4.8 EHRs Concepts

As mentioned in the last section, my EHR concept has three main components, the patient's device, the doctor's device, and the shared/mobile station. With each of these three items, specific parts of the form are not as important as others. I do not mean to devalue the importance of aesthetics, for aesthetics do serve an important role in design. Instead what I am proposing here primarily focuses on the affordances granted to, and the effects put on, the users through the objects' agency and form. Implications of these affordances and effects will be discussed in the final chapter. Furthermore, final forms of these devices would be developed through prototyping and testing. However, as I will discuss more in the final chapter, I do not perform these parts of the design process. In this section I will explain each piece and how they work together. In the following section I will provide a narrative to illustrate how the room and my EHR concepts could be put in use.

The Patient's Device

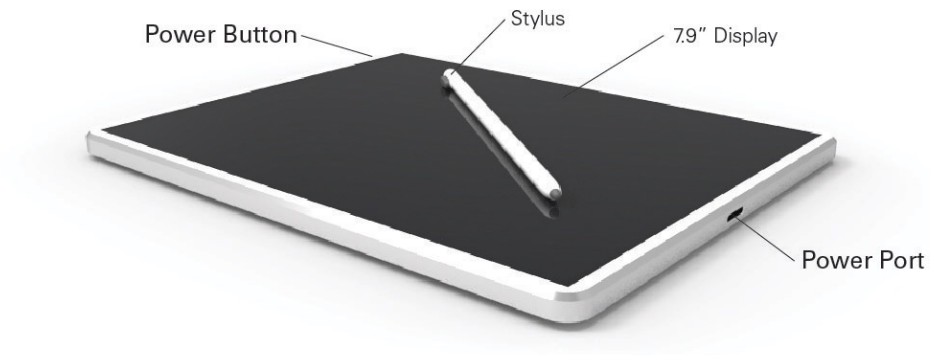

FIGURE 15

As discussed in the insights and opportunity section, I believe there could be great benefits gained in the interaction by giving the patient access to their EHR during their visit. Having access to their health record before and during the exam would allow them to verify information in their personal profile, express what their reason(s) for visiting is in their own words (Nusbaum, 2011), and even take notes during the exam. I imagine the patients using a device to be very similar to a simplified version of a commercial tablet, such as the iPad mini, and a stylus to carry out these actions. I use this basic form because the size (7.9" screen) is large enough for patients to easily view material yet small enough

to carry the device between the waiting room and exam room. Also its similarity to commercial tablets will make it easier to use by anyone who is familiar with those devices.

However, I describe my concept as a simplified version of a commercial tablet because patient's would not need all of the standard features of most commercial tablets. For privacy reasons patients will use a touch screen interface to type or write. Therefore, a microphone and speakers are not needed. The camera could also be removed, because although photos documenting the patient's condition would be useful to have in the EHR, they could be taken by the medical staff. Furthermore, the simplicity of the object serves two other purposes. First, simplifying the device reduces cost of each unit. Second, simplifying the device removes buttons and cracks where dirt and germs can hide. Because these devices will be used by multiple patients they need to be easily cleaned between use. The only exterior features on the device are a small charge port and a power button. I briefly considered providing a slot to store the stylus in the device but decided against it to prevent a cavity where dirt could collect. Like the device, the stylus would also be collected and cleaned after each use.

Although I do not devote major attention to the digital interface of the device I offer the following notes: To make up for the simplified exterior the digital interface will need a static menu bar on the screen containing: navigation and accessibility features, such as text size adjustment for the visually impaired. Furthermore navigation should be easy and guide the user through the needed steps. For example, after securely logging into their health record a patient could first be prompted to enter the reason(s) for their visit. Next, they could be presented with any forms the care staff has requested. Then, they could be directed to their basic profile information to confirm or make changes to personal

information such as address and insurance. Finally, patients would be able to freely view their record or switch to the note pad feature.

The Doctor's device

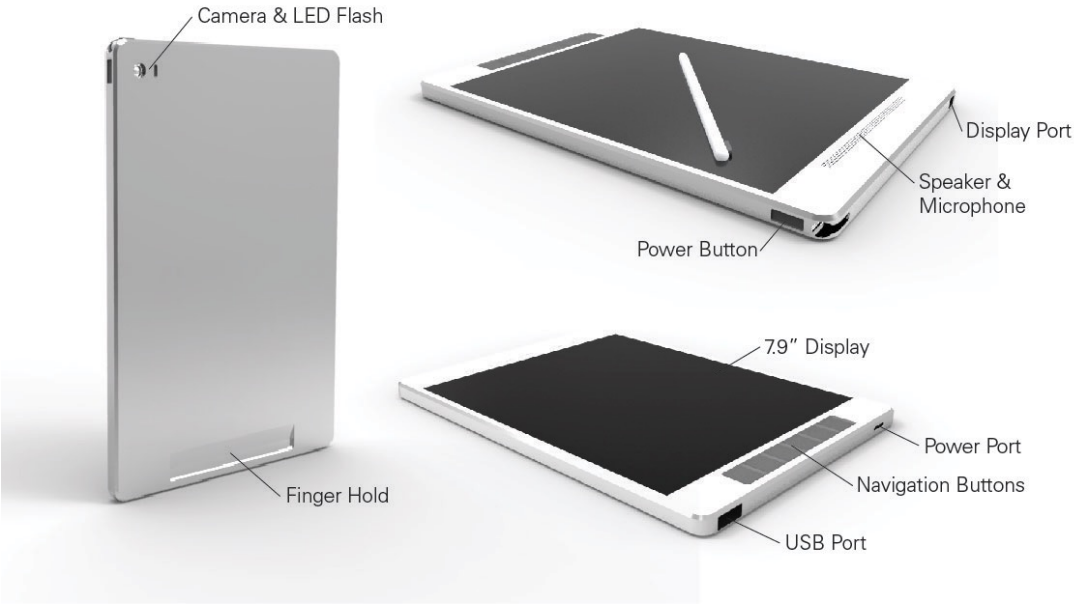

FIGURE 16

As discussed in the Section 4.7, I played with ideas that would not use a physical interface to directly interact with. However, I have decided to return to a physical screen like current EHR systems. Like the patient's devices, I also imagine a tablet like device for the doctor. Tablets are easily portable so doctors can carry them around the office to use whenever they are needed. According to a physician review of the iPad and Nexus 7 the ideal size of a tablet is about a 7-8" screen diagonal (Husain, 2012). This size allows a large enough screen to view information, but a small enough device to fit in and not weigh down

lab coats.[26] However, current tablet devices, like the iPad or Nexus 7, provide a major issue for using as EHRs in context of PCC best practices. As discussed, because of the size and touch screen interfaces physicians must keep tablets close and facing towards them. This makes it difficult for the doctor to share the screen with the patient, either to show charts or the work they are currently performing. Therefore I have designed this tablet to easily dock into a larger interface that allows for easier sharing. The dock and larger interface are explained below. To encourage the doctors to dock the device instead of keeping the EHR to themselves, as observed in Chapter Three, the device would not have a stand case and keyboard like the product in Figure 17.

FIGURE 17 - IPAD WITH LOGITECH'S KEYBOARD FOLIO (IMAGE CREDIT: MACWORLD.COM)

[26] Husain (2012) even notes some physicians weighing down the other side of their coats to balance the weight of tablets.

In addition to docking the doctor's device has a few other features. Along the edge is an USB port to attach other equipment like GE's VScan portable ultrasound device (GE Healthcare, 2014). Connecting other medical devices would allow physicians to automatically record data straight into the patient's health record. The port is located opposite of the docking port to allow the device to be docked yet still accessible to be connected to other devices. The doctor's device should also have a camera to take photos of patient's injuries and conditions. Furthermore, a microphone and speaker should be included for physicians that use dictation methods to record notes, in or outside of the exam room. Although an easily cleaned exterior is also important for the doctor's device it is not as necessary as the patient's device. Therefore, I have included a slot to store the physician's stylus, and physical navigation buttons. Physical navigation buttons will reduce clutter in the digital interface while also allowing doctors to quickly jump between sections of the EHR. Navigation buttons are counter-sunk into the surface to allow the device to easily slide into the dock.

The Shared/ Mobile Station

FIGURE 18

The main component of my EHR system is the shared/ mobile station. This station is part of the table in the communication area of the exam room. It is docked on the door end of the table with an equal surface height as the fixed table. The station is designed as part of the communication area table because it places the EHR within the communication space and it reduces the amount of used floor space if the mobile station was separate. On the top surface it features a large display on a pivoting arm, a docking port for the doctor's EHR device, a keyboard and mouse, and enough area for the patient to place their EHR device. When the physician wants to share information with the patient via their EHR device they can dock it in the station. When the device is docked its screen appears on the larger

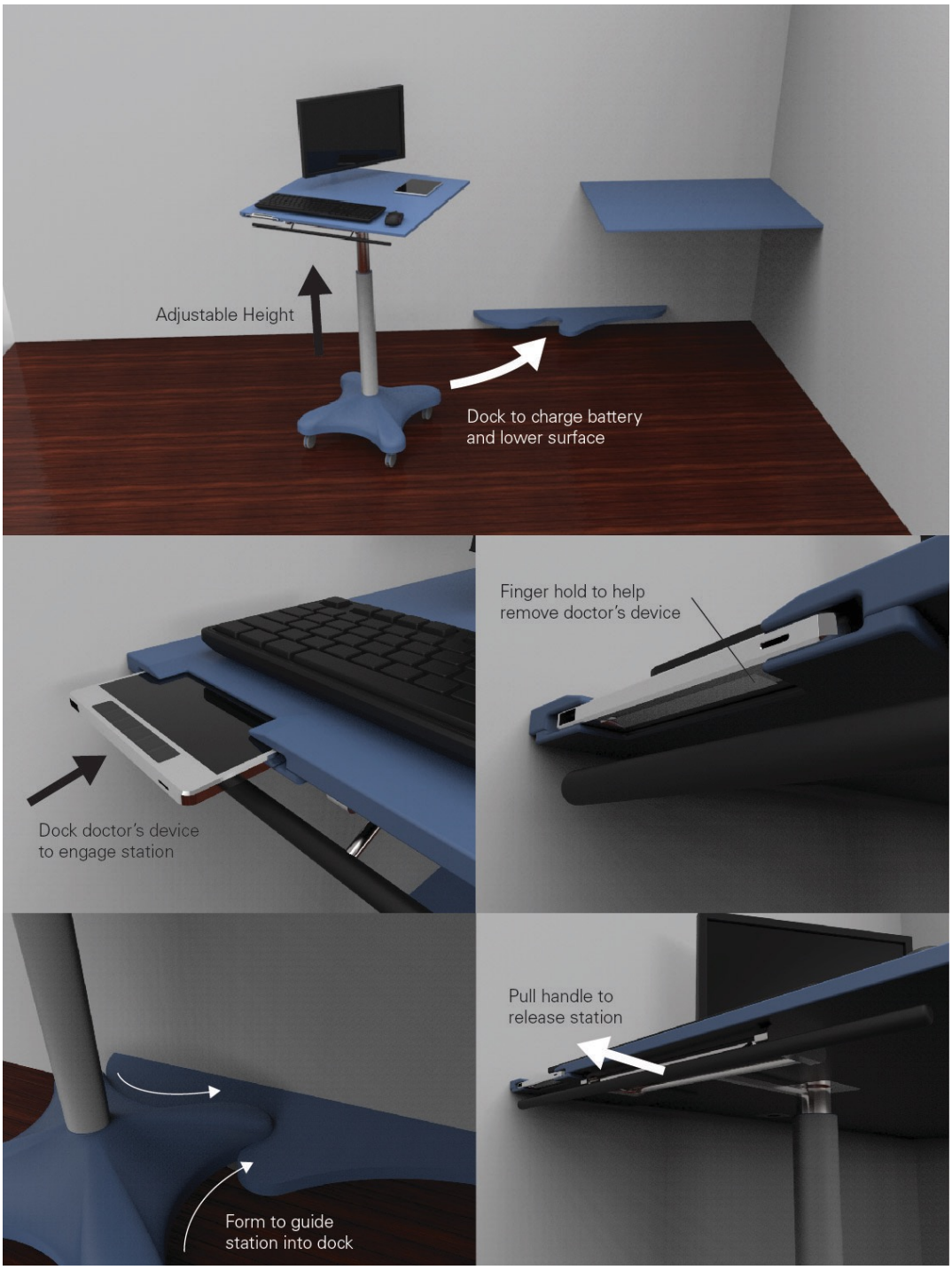

FIGURE 19

display, which can be easily angled and shared with the patient. Meanwhile the separate keyboard and mouse allows the physician to easily navigate the EHR system while sharing

the screen with the patient. The physician's EHR device is used as the computing source instead of an entirely separate unit to reduce costs of additional hardware and software, as well as improve the efficiency that would be lost if the doctor had to log in and navigate to the needed page. When the doctor docks his/her device the interface would open up to the current patient's profile.

In the event that the doctor and patient want to use the EHR system in another section of the room the station can be detached from its docked position next to the fix table and moved about the room. The station contains a small battery to power the different components while it is away from its docked position. If the physician and patient want to use it next to the exam table the station can be raised to a standing height. When the interaction is over the station can be easily moved back toward the fixed table where guides will direct the station back into the proper location as well as automatically release and lower the surface to once again be flush with the fixed table. While docked the station will recharge the battery for the next mobile use.

4.9 The New Experience

To illustrate how I imagine that everything could come together as one system I offer the following hypothetical narrative starting with the patient arriving at the doctor's office.

Richard Banks, 58, arrives at his doctor's office fifteen minutes before his appointment as requested. He enters the lobby and is greeted by the office staff. After Richard signs in, Trudy, one of the office staff, hands him a personal EHR (pEHR) device and informs him that someone will be with him shortly, and that he can have a seat and wait. Richard takes a seat and logs into the pEHR. A welcome screen appears with

announcements that flu shots are now available and that Dr. Jones will be away next week to attend her daughter's wedding. Richard closes the announcements and is prompted with a question about his reason for his visit. Richard types that he has been experiencing some back pain and also needs to schedule his yearly blood work. After submitting his answers, Richard's patient profile appears and he is prompted to review and make any changes to keep his profile current. Richard notices that his medicine list wasn't updated after he visited a specialist last week. He adds the new prescription to the list and confirms the rest of the profile.

Mean while, Nick, one of the clinic's nurses, receives word that Dr. Jones just finished with a patient, a that he can escort the next patient back. Nick checks the schedule on his EHR device, and sees that Richard is next. Nick clicks on Richard's profile and in addition to his health record, sees a photo of Richard, that he has recently added a new medicine to his list, and that he is visiting for back pain and needs to schedule blood work. Nick walks into the waiting room and approaches and greets Richard. The two then walk out of the waiting room and into the exam room. Upon entering Nick states, " I see you are visiting us today for some back pain you are having, and that you need to schedule your yearly blood work. Why don't you sit in one of those two chairs where you might be more comfortable, and I can take your blood pressure there."

Richard walks up to one of the chairs at a table towards the back of the room, places his pERH device on the table, and pulls out a chair which easily moves across the floor. Meanwhile, Nick sets down his ERH device on the table, grabs the sphygmomanometer (blood pressure monitor) from the cabinets across the room and finally sits down next to Richard on the stool. Richard and Nick converse about weekend plans as Nick takes

Richard's blood pressure. After completing the check, Nick informs Richard of the results as he enters them in Richard's profile on his EHR device. Nick then states, "That's all the checks I need to do now. Do you have any questions or want to discuss your health record before I go?" Richard tells Nick about the change to the medical list, which Nick then confirms that they received the change and thanks Richard for updating his profile. Lastly Nick says farewell to Richard and mentions Dr. Jones should be in soon. After Nick leaves, Richard turns to the notes section of his pEHR and writes a reminder that his blood pressure was a little high and that he should get the low sodium recipes from Allen.

Out in the hallway Dr. Jones finishes ordering x-rays for another patient in her EHR device, and then selects the next patient option. Richard's profile appears with his complete health record, recent changes to his profile, reason for current visit, and Nick's note on the blood pressure test. Dr. Jones enters the exam room Richard is waiting in and greets him before taking a seat on the stool and setting her EHR device on the table in front of her. Dr. Jones then says, "So Richard, I see you are having some pain in your back and we also need to schedule some blood work. Is there anything else you want to go over while you are here?"

Richard states that the back pain is the only main reason for his visit and then begins to tell Dr. Jones about his specific issues with his back and when they started. After Richard's description Dr. Jones expresses that she would like to take a look at his back and asks if he can move up to the exam table so they can have more room. Richard slides back his chair, gets up, walks across the room, and sits on the exam table. Using the foot pedal, Dr. Jones raises the height of the exam table so Richard is at a good height for her to examine his back. After finishing the exam, Dr. Jones informs Richard that she thinks he has strained

his back muscles and recommends resting for a few days to allow them to heal. She further states that she can write him a pain prescription if he wants something for the pain and that she also recommends some physical therapy after his back has healed to strengthen the muscles to help prevent future strains. Richard tells Dr. Jones that he is not interested in the pain medication but he would like recommendations to a physical therapist. Dr. Jones agrees with his decision and suggests that they look up a physical therapist on the EHR system. Before grabbing the EHR, Dr. Jones asks Richard if he would like to stay on the exam table or return to a chair. Richard states he is fine on the table.

Dr. Jones then walks over to the table picks up her EHR device and slides it into the dock on the mobile station. She then releases the station from the fixed table, brings it to standing height and positions it next to the exam table where she can jointly view it with Richard. Together they review and select potential physical therapists. Richard remarks that he much rather make a personal note of the therapist's contact information and leans forward and grabs his pEHR device from the mobile station and records the note. Next Dr. Jones suggests that they schedule Richard's blood work and review the results from last year.

After Richard and Dr. Jones have gone over the past year's results and scheduled this year's blood work, she asks if there is anything else he needs before they end the meeting. Richard says he is fine and thanks Dr. Jones for her help. Dr. Jones helps Richard off the table, and then pushes the mobile station back to its docked position. The mobile station slides into place and automatically lowers to the height of the adjacent table surface, ready for the next visit.

Dr. Jones and Richard leave the exam room and exchange goodbyes in the hallway. Richard returns to the waiting room to check out. At the reception desk, Richard gives Trudy back the pEHR device and pays his co-pay. Trudy hands Richard his receipt and a printout of his notes from the exam. Richard leaves the office and Trudy wipes down the pEHR device so it is ready for the next user.

As stated, this narrative is meant as an illustrative example of the doctor-patient interaction including the concepts I am proposing. The events of the narrative were influenced by observations of the data used in the analysis and interviews with participants. Of course there is an infinite potential of interactions, and this narrative is only one fictional example. Nevertheless, it is meant as a plausible interaction that could occur.

4.10 Implications towards the AMA's call

At the beginning of this chapter I stated that I align this work to the American Medical Association's (2014a) call for a design overhaul of EHRs. However, I further stated that it is not within my current scope and resources to respond to the entire call, but that I aim to address specific points. Furthermore, that I will address these points not through redesigning the digital user interface and architecture as the AMA's call discusses, but through conceptualizing how the exam room can be optimized for EHR use, and how an EHR system could be designed based on the interaction between physicians and patients. My move away from addressing the issues of the digital interface and architecture is not because I do not agree with the AMA, but that I believed there was an opportunity waiting to also rethink how EHRs were incorporated in the exam room and used by the

participants. Although my design direction differs from the AMA's call, I still believe it speaks to some of the issues they express.

First, to enhance physicians' ability to provide high-quality patient care the AMA (2014b) states that, "The EHR should fit seamlessly into the practice and not distract physicians from patients. The arrangement of electronic devices in the care setting should seek to limit distractions." (p.4). Taking insights from the analysis in Chapter Three, participant interviews, and additional observations, I rearranged the exam room to try to optimize participant interactions between each other and the EHR system. Now, participants sit side-by-side where they can easily jointly focus their attention to each other and the EHR instead of sitting awkwardly across the room.

Furthermore, to help offer product modularity and configurability, participants can easily move their seating and EHR system around the room to have the same access during all parts of the exam. Therefore, reducing the inefficiency of having to walk back and forth between the EHR and patient.

Next, to help facilitate digital and mobile patient engagement, I created a part of the EHR system to be used directly by the patient while they at the doctor's office. Providing patients the ability to interact with the EHR, beyond their at home web portal, could benefit the interaction and care in many ways. Patients would be encouraged to actively participate more in their care. Having patients fill out digital forms and verify their profile information can reduce the workload that is placed on office staff and nurses, thus allowing them to focus more on the patient's health. Patients could also help insure the accuracy of their records by catching mistakes by care providers.

Chapter 5 - Conclusion and Discussion

A person's health is a complicated thing, and is only made more complex by the system that is meant to care for it. Central to the healthcare system is the place of care, or the nexus where the doctor and the patient intersect. More often than not, this space is an exam room within a clinic or hospital. Here doctors and patients meet to discuss ailments, diagnose causes, and plan treatments. However, this interaction does not happen in isolation of environment factors. The environment provides for this interaction, and it is possible for the space and equipment contained within to affect the interaction in either positive or negative way.

Within this work I have analyzed some negative influences related to the arrangement of the room or use of electronic health records. It was the purpose of this work to propose possible changes to EHRs and exam rooms and how they are used to improve future interactions between physicians and patients, and thus the care of the patient's health. In an analysis of video recorded interactions between doctors and patients, I offered examples of how doctor's attention towards health records can cause the interaction to be marked as problematic by the patient. Additionally, I discussed how the orientation, or ecological huddle, between the doctor, health record, and patient can strain the interaction through inefficient and uncomfortable embodied actions, as well as privilege the physicians access to the health records.

From a synthesis of this analysis and additional research, including interviews with a doctor and three patients, I identified multiple opportunities to design interventions. While defining opportunities I tried to frame them in ways that would promote a patient-centered care approach to care practices. Specifically I tried to advocate for interactional

equality between the participants. As a response to the opportunities I identified, I offered changes to the layout and objects of the exam room, as well as three parts of a new EHR system that would be used in and out of the proposed exam room.

5.1 Theorized Implications for Doctors and Patients

First, I do not argue that what I conceptualize here is the perfect answer, but that it is a different answer, which questions the current norms of doctor-patient interactions. Additional research and testing is needed in order to claim that my proposed concepts are at least better than the current system. Therefore, the implications discussed here are theoretical until hypotheses have been tested. Opportunities for future research and development are discussed more below. Additionally, while some of my proposed design interventions, like adding wheels to the patient's chair, may seem simplistic and underwhelming, I believe even these subtle changes could have more profound impact on the interaction than some 'flashier' interventions. As the world famous designer Dieter Rams states in his 10 principles of good design, "Good design is as little design as possible." (Vitsoe, 2015,¶ 11).

The proposed exam room arrangement and changes to furniture have been conceptualized to de-emphasize the biomedical portion of the exam to ease patient's anxiety during the exam. Room and furniture changes are also meant to improve the space for better communicative and embodied interactions. Creating a flexible space where the physician and patient can easily and comfortably converse will ideally improve communication behaviors of the participants. Improved communication behaviors could potentially: build trust between the participants, encourage patients to share more

necessary and accurate information, which in turn allows the doctor to more accurately diagnose the patient (Frankel, 2001; Beach et al., 2004), encourage the doctor to discuss treatment options with the patient, and have the patient better adhere to co-decided treatment regiments (Roter & Hall, 2006).

Proposals to the EHR also carry great potential for both participants. For example, granting patients better access to their records could allow them to develop a better understanding of, take more responsibility in, stay current on their own health. This would further assist patients in following treatment regiments and improving/ living with their conditions. A patient's access to a device that gives them the ability to define their health as they experience it, directly into their health record could be very beneficial. Considering the interaction of the first extract, it can be surmised that if a physician does not take the time to at least acknowledge a concern during the exam that they will also not include it in the patient's health record. Leaving out details of the patient's health creates discrepancies between the inscribed on record and the embodied patient in the room. Returning to the interaction of Extract 1, the woman could have expressed in her record that she was dealing with some depression and that her bodily pain was causing some lifeworld issues. Although the physician may still ignore this expression of concern during the interaction, it would at least be on record that the patient has expressed a concern of depression. Unless the doctor responds to the concern it will also go on record that the patient still has outstanding concerns that have not been addressed.

Additionally, as I identified with opportunity 3b, giving patients access to their record would allow them to enter in and update basic information, therefore giving care providers more time to focus on care and not data entry into the system. Furthermore,

patients would be another set of eyes on their record to catch mistakes. This has the potential to further reduce the amount of medical errors, thus not only saving healthcare providers money and reputation in malpractice cases, but more importantly prevent events that could further threaten a patient's health or life. For example, later within the interaction of Extract 2 the patient informs the physician that the physician had recorded the wrong leg to be x-rayed. The patient had the radiologist x-ray the correct foot and tells the physician that it needs to be changed in the health record.[27]

Lastly, the combination of the doctor's device and mobile station could also create meaningful interventions within the interaction. By not having a keyboard attached to the doctors device (see Figure 17), the doctor would be encouraged to dock their device into the mobile station for easier access. The purpose of this action is three fold. First, to discourage the doctor from keeping their EHR to themselves, as was seen in the data of Chapter Three. Next, to allow the patient and doctor to jointly engage the EHR when it is necessary. Lastly, this could help the physician communicate what actions they are taking and how it relates to the interaction. In turn, this should help educate patients not only on their health but the process of the interaction, thus, reducing the knowledge divide that can cause a patient to mark an interaction as problematic as see in Extract 2.

5.2 Limitations

The sheer scale and complexity of electronic health records and doctor-patient interactions, yet alone the healthcare industry, brings both self-imposed and encountered limitations to this project. I acknowledge the narrowing of my focus of course excludes

[27]This section was not shown in Chapter Three.

important phenomena from both doctor-patient interactions and the healthcare system. Nevertheless, I limited my research to maintain a manageable scale of this study. I started by focusing on the interactions between primary care physicians and their patients within the exam room. However, doctor-patient interactions still provides too much to cover within a single project. Therefore, I limited my scope to the use of electronic health records. Yet still, as I discussed in regard to the AMA's call for a design overhaul of EHRs, even redesigning the entire EHR in the exam room would be too much and beyond my expertise. Therefore, I set aside the digital user interface and focused on how the physical components of the EHR could be used and incorporated within the exam room and interaction. I acknowledge that the digital user interface is the cause of many issues within the interaction. However, in Chapter Three I hopefully demonstrated that even the placement can be an issue, and therefore should be given attention.

Encountered limitations mainly arose due to availability of resources. Although I was able to speak with three patients, unfortunately the multiple attempts to interview physicians only resulted with one interview. Interviews are an essential part of research, especially to the design process. User interviews help build empathy for the users, identify issues, and give context to the designer. I self-identify the low number of physicians interviews as a limitation to this study, and in attempts to supplement the research gap I reviewed literature and case studies (such as Mayo 2006) to gather second hand insights.

Another limitation which is both self-imposed and encountered is my completion of the design practice. As discussed in Chapter One, a complete design practice goes through defining scope, research, ideation, prototyping, and production. Within this study I have only gone as far as the practice of ideating new concepts. My study ends at this practice due

to the resources that would be needed to complete the full practice. In addition to extra time and financing, I would need resources to prototype, access to doctors, patients, and exam rooms to test prototypes, and then final production resources including code developers and industrial manufacturing facilities to produce real practice ready designs.

5.3 Future research

The limitations of this study provide multiple opportunities for further research. One of the first points would be to continue the design practices to a more complete product. This process would begin with additional participant interviews with a focus on increasing the number of physicians participants. These interviews would provide beneficial insights directly from the people who would be using the EHR system. Following the interviews and additional design work, prototypes could be made to test how the proposed EHR system would influence the interaction. The use of time and efficiency is an important part of the interaction (Roter and Hall, 2006; IDC, 2013; AMA, 2014b, Physician 1, personal communication, 3.19.15). According to Mechanic et al. (2001), the average medical visit is only 17 minutes in the U.S., and the duration can have many effects on outcomes as well as perceived quality of the interaction (see Roter and Hall, 2006). Prototyping conceptual designs could test how they affect time and efficiency. For example, this thesis has discussed how the physician's use of EHRs can create issues within the interaction. However, even though other scholarship[28] discusses benefits from having patients participate in their record, it remains unknown how the patient's use of an EHR

[28] See Shenkin and Warner (1973), Westin (1977), Kirby (1991), Carter (1998), Ross & Lin (2003), Roter and Hall (2006), Bernabe-Ortiz et al. (2008), Ruland, Starren, & Vatne (2008).

device could problematize the interaction in a similar manner as the physician's use. Moreover, the prototype testing could be analyzed with LSI methodology to compare interactions between the new and old systems. Such analysis would be vital to future concept development.

Beyond continuing the design process there is ample opportunity to continue other parts of this study. First, most scholarship on EHRs have focused on negative effects on the interaction. Additional studies that empirically analyze the positive effects of EHR use could prove useful. Furthermore, desktop computers are the only EHR technology used in the video recorded data used in this analysis. Data of physicians using laptops and tablets could provide a chance to study any different effects the EHR technology may have on the interaction. Next, my analysis discussed interactions between a doctor and a patient, however, some patients are accompanied by care providers or family members. Additional research could provide insight on how other participants can interact with the EHR. This analysis could also benefit from an analysis examining how sexuality, age, illness, ability, and non-traditional Western medicine practices affect the interaction and use of EHRs. Lastly, the limitation defined by my scope leave opportunities for LSI and design to be combined to more directly respond to the AMA's call for a design overhaul, including the digital interface and network components of EHRs throughout the entire healthcare system.

5.4 LSI and Design

As a final set of remarks I would like speak on the multidisciplinary combination between language and social interaction and various practices of design. Through the experience of prior work and this study I strongly believe there could be, and should be, a

productive and mutually beneficial partnership between the two disciplines. Although each discipline is complete on its own, and with decades of success to show for it, the two fields have something to offer the other.

The theories and methodologies of LSI create some wonderfully insightful analysis of human communication and interaction, yet even its practical and action-implicative work can be limited in its means of producing interventions. Although journals and conferences are a great way to share ideas, they are not a direct means of manifesting insight into the built environment. Furthermore, there has been extensive discussions by design scholars on the issue of a lack of critical theory and methodology within design (Cross, 2001; Bayazit, 2004; Agid, 2012; Julier, 2013; Farrell & Hooker, 2014; van de Weiger, Vanl Cleempoel and Heynen, 2014).[29] Considering these two points, I see design as a means to help LSI scholars take their insights beyond the page, and I see LSI providing a critical lens that designers can use to study the interactions that they are designing for. Together the work that could come from this partnership has the potential to be ground breaking.

[29] Although not design scholars, Aakhus and Jackson (2005) express a similar disposition.

Appendix A - Gail Jefferson's Transcription Symbols

see (Atkinson & Heritage (Eds.), 1984, pp. ix-xvi)

: Colon(s): Extended or stretched sound, syllable, or word.

__ Underlining: Vocalic emphasis.

(.) Micropause: Brief pause of less than (0.2).

(1.2) Timed Pause: Intervals occurring within and between same or different speaker's utterance.

(( )) Double Parentheses: Scenic details.

( ) Single Parentheses: Transcriptionist doubt.

. Period: Falling vocal pitch.

? Question Marks: Rising vocal pitch.

↓ ↑ Arrows: Pitch resets; marked rising and falling shifts in intonation.

° ° Degree Signs: A passage of talk noticeably softer than surrounding talk.

= Equal Signs: Latching of contiguous utterances, with no interval or overlap.

[ ] Brackets: Indicates beginnings and endings of speech overlap.

[[Double Brackets: Simultaneous speech orientations to prior turn.

! Exclamation Points: Animated speech tone.

- Hyphens: Halting, abrupt cut off of sound or word.

> < Less Than/Greater Than Signs: Portions of an utterance delivered at a pace

< > noticeably quicker (> <) or slower (< >) than surrounding talk.

OKAY Caps: Extreme loudness compared with surrounding talk.

hhh .hhh H's: Audible outbreaths, possibly laughter. The more h's, the longer the aspiration.

ye(hh)s Aspirations with periods indicate audible inbreaths (e.g., .hhh). H's within (e.g., ye(hh)s) parentheses mark within-speech aspirations, possible laughter.

pt Lip Smack: Often preceding an inbreath.

hah Laugh Syllable: Relative closed or open position of laughter.

heh

hoh

$ Smile Voice: Words marked by chuckles and/or phrases hearable as laughed-through.

Appendix B - Karen Tracy's Transcription Symbols

See (Tracy, 1997, p. 180)

CAPS This indicates speech that is louder and more emphatic.

! This indicates that speaker is exclaiming.

- Hyphen indicates syllable that is abruptly cut off

" " in excerpts; quotation marks indicate reported speech

( ) Parentheses indicate transcription doubt. Length of parentheses offers rough indicator of length of undecipherable speech

(( )) Double parentheses are used to describe interactional style or nonsuch activity. For example ((group laughter)) or ((pause))

{ } Braces are used to indicate that a specific word has been replaced with a category term. For instance, if a speaker said "in the speech accommodation literature, it's been documented that," the transcript might read "in the {name of literature} it's been documented that."

[ ] Brackets are used to cue explanatory material added by the analyst.

. . . Three-dot ellipsis is used to indicate that a segment of text has be elided.

italics Italics are used to draw attention to a particular segment that is the focus of an analytic point

Appendix C - Chapter 3 Transcripts

MC 20-09

```
             ((Knock Knock))
01  PAT:     Hi.
02  DOC:     Good Mornin'.
03           3.0 ((Door Closes))
04  DOC:     Well what's up tihday?
05           (0.2)
06  PAT:     Well, I need somethin'=for that back and arm pain.
07  DOC:     Okay.
08           (0.7)
09  PAT:     And uh (that same-) my toes (are still dian) going numb on this
10           foot. Um, what that's from. But it th- this leg is partially (.)
11           numb anyway, remember from back surgery.=
12  DOC:     (Your) Back.
13  PAT:     So I don't know if that moved down there or not.=But sometimes
14           It's annoying.
15  DOC:     Okay. So you're having some problems with your back (0.2) your
16           arm, your le[g and where else,
17  PAT:                 [Well it's across here.=
18  DOC:     =(Ka[y.)
19  PAT:         [And down he:re. They took eh- x rays I think [uh Doctor
20  DOC:                                                      [Mm.
21  PAT:     Stout did.
22           (1.3)
23  PAT:     Sep- And somebody else (Del) Mark, he sent me for x-rays. But
24           She took- gave me the CAT scan.
25           (1.0) ((Doctor pulls out keyboard tray))
26  DOC:     O[kay.
27  PAT:      [And she said I evidently  had a mini stroke. Which (.) °I
28           Don't really remember havin[g.
29  DOC:                                [Grea:t. ((sniff)) Okay,=
30  PAT:     =Didn't know it.
31  DOC:     Did you have any other things that you need to talk about
32           today.before we get into that further?
33           (1.0)
34  DOC:     Cuz I'll be able to look in here and see (if you) have anything
35           in here on that mini stroke (.) question. (.) Anything else
36           goin' on?
37           (0.3)
38  PAT:     No.
39           (0.5)
40  PAT:     Miserable.
41           (0.6)
42  DOC:     Really,
43           (0.2)
44  DOC:     When'd you see Doctor Stout last.
45  PAT:     A:h, couple weeks ago.
46  DOC:     Mmkay.
47  DOC;     I'm going (get you something) from the Internet.
48  PAT:     (Maybe it was a week ago) It has not been long.
49           (1.0)
50  PAT:     Unhappy. (.) Just miserable.
51           (4.0) ((Doc typing on computer)) ((Typing Stops))…
52  PAT:     Course I guess there's a lot of that going around, huh?
53  DOC:     MYeah. Some people are starting to feel better because it's
```

DOC: spring.
(0.7)
PAT: I shou:ld, but I'm no:t.
(6.0)
DOC: Alright, yeah she did send me something.
(8.0)
DOC: ( )
(8.0)
DOC: Mild to moderate (illarg stinosis.)
(0.3)
PAT: What that mean?
(1.0)
DOC: Means you have very minimal ((sniff)) narrowing of your aortic valve.
(3.0)
DOC: You have mild LVH, left ventricular (perchaby) means the muscles in your ventricle are a little thick.
((Sniff))
The (ejection) fraction is normal.
(18.0)
DOC: She told you to stop the Zocor for a while?
PAT: Yeah.
(0.3)
DOC: And?
(0.5)
PAT: Same thing.
DOC: Still achy, An=
PAT: =Yeah.=
DOC: =Sore and everyth- So it's probably not the Zocor (huh).
((Sniff))
PAT: °(Nuh)°
(11.0)
PAT: (Figure that'll be it) for a while. An if it get- It gets worse some days.
(1.0)
DOC: °(Oh yeah/That's annoying)°=
PAT: =Need to have somebody ta hold my coat- well I still do to get it on.
(0.3)
PAT: It's $Mmhuh$ Get one arm in it- If I got the wrong arm in first then I'm out of luck.
DOC: Mm.
(1.1)
PAT: Good thing I've a lot of friends to hang around. Help the crippled (one.)
DOC: Mm hm.
(1.0)
DOC: °They're° good for something aren't they.
PAT: Yea::h.
(3.5)
PAT: Something you can't get along without in this world are friends huh? Not very easily anyway.=
DOC: It's tougher.
(6.0)
PAT: What am I a basket case? I need- put away, or.
(6.5)
DOC: (Did) she said she was going to check your corradates and a CAT Scan of your head, huh?

PAT: Mm hm. She did it.
(2.0)
DOC: °Okay.°
(5.0)
DOC: (Mm) ((Reading computer screen))
(9.0)
DOC: ((Sniff))
(17.0)
DOC: ((Begins typing)) (5.0)
(30.0)
DOC: °Why do they have to make this so difficult.°
PAT: (Not our hand, hm)
(57.0)
DOC: So you need something for pain more than anything else I guess.
(2.0)
DOC: This was the one that's bugging you more?
(0.2)
DOC: This one,
(0.3)
DOC: Okay. This is probably coming from your back.
PAT: I:- I I would think so.
(8.0)
DOC: When I touch down here can you feel that?

MC 6-10

((Knock Knock))
DOC: Al::right Janet ( ).=
PAT: =Huh huh=
DOC: How are you doing today?
PAT: W(h)ell Heh heh I hurt my foot $f(hh)or o(h)ne. Heh.
DOC: Okay, tell me a little bit about that.
PAT: Um, I was (.) getting into our- um our pool, (.) and I don't know I- I kinda miss stepped and when I went to f(h)all heh in,
DOC: Mm [hm.
PAT: [my foot kinda got twisted on the side of the pool, and it's been hurting-It's been about a week since I did it, but it's not feeling any b(hh)ett(h)er.=In fact it's been hurting worse.=So, I figured I should c(hh)ome i(hh heh)n and get it looked at.
DOC: Very good. And are there some other issues you'd like to discuss today?
PAT: Um I needed to get some um prescriptions for some of the medications that I already take with you. [Um
DOC: [Yes.
PAT: Ah cause I d(hh)on't h(h)ave an(h)y.
DOC: Alright.
(1.0)
PAT: It's with the u:m (0.7) the (0.2) Lipitor?
(0.2)
PAT: I don't have any and I haven't had it for a while.
(0.2)
PAT: So, .h um I do have some of the blood pressure one which is the Ri- Rithum
DOC: (Prosemithol)
PAT: Yeah.
DOC: (Okay.)
PAT; And- (.) the one- (.) I think it's (.) this one, the one that you had given me before for the itching a[nd stuff
DOC: [Mm hm
PAT: That <u>real</u>ly (hehh)[helps and I don't] h(hh)ave that a(h)ny
DOC: [(Oh you)]
PAT: m(hhh)ore, so .hh that would be heh
DOC: (Bet[ter.)
PAT: [The other one that I (really needed, so)
DOC: Okay, so I could write that up for you.
PAT: Okay. .hh Um I want to 'em with um the (mail in one for mine) So they do it three months [at a time.
DOC: [Excellent.
PAT: Oh, okay.
(0.6)((Doctor starts to examine patient's foot))
PAT: It's- the part that hurts the worst is right (.) on that Knuckle, and it hu- goes down into my foot, and you can see that °it's bruised in-between the toes and°
DOC: Show me how far you can move your foot.
PAT: I can move it up (.) But I can't point my to:es:=
DOC: =Right and what we're going to do is make sure there's not a compression fracture.=
PAT: =>Okay.<=
DOC: =So we will send you down for an x-ray.=
PAT: =Okay.

(2.0)
PAT: And I have a pinched nerve in my back so I don't know if that's what's did it. But since (.) I mean this last week since I've hurt my toes=
DOC: =Mmhmm.((Slides back towards desk))
PAT: Those toes have been tingling a lot more than:: than:: normal. I I mean [than usual.=Cause my feet go to sleep [anyways with my-=
DOC: [Well [Mmhmm
PAT: =the [pinch nerve in my back. [(.) But usually its only when-=
DOC: [Mmhmm [Yes
((Doctor starts writing in patient's file))
PAT: =when part of my foot is sitting on the ground. But- (.) its like I said the toes on that foot have been tingling a lot more this last week so:: (.) I didn't know if that had anything to do with my- twisting my foot or::=
DOC: =Well we'll see
PAT: hh. Ju(hh)st le(hh)tting you know.
(10.0)((Doctor writing in patient's file while patient watches))
PAT: I guess- I was telling your nurse that at least I fell in the [pool with the water so at least it was(hh)n't a h(hh)ard la(hh)nding. I didn't hurt my back or anything. That's good.
(1.0)
PAT: My foot just wanted to stay up on the side of the po(hh)ol. [hah= the re(hh)st of m(hh)e: went in ha [hh ha
DOC: [^Mmhmm [O::ka::y.
(14.0)((Doctor writing in patient's file while patient watches))
DOC: Al:ri:ght you get to take this [to the x-ray department
PAT: [Okay
((Hands patient a form))
PAT: Mmhmm
DOC: And when you come back I'll have your prescriptions written and we'll see ((drums hands on clipboard)) what we're gonna do.
PAT: Okay.

MC 17-2

DOC: Hello
PAT: Hello
DOC: How are you Tracy h
PAT: Oh not too good
DOC: Not too good havin' trouble with nausea
PAT: An' my knee I wanted to show you my knee
DOC: Okay (x) what's going on
PAT: Well (x) I been in an awful awful a lot o' pain with my left knee
DOC: Mm hm
PAT: A:n' it's causin' me to slip and fall my knee hyperextends it goes back too far .h you know an' this one is stronger but this one here I been having a lot of swelling an' a lot o' pain an' I just cannot walk
DOC: Hm okay
PAT: tch
DOC: And=when did this start
PAT: Oh it's been goin' on for a while but I tried to get into um university orthopedics
DOC: Mm hm
PAT: But they wouldn't
DOC: Okay
PAT: I I I [I just]
DOC: [so a] couple weeks it's been goin' on for
PAT: It's been goin' on for a couple months but lately it's just been super duper bad
DOC: What hurts
PAT: Eh thuh whole thuh whole knee an' sometimes it eff' see this happen one other time I don't know if you know Doctor (Yoder)
DOC: Mm hm
PAT: Well thuh last time this happened all thuh swelling went down in my leg an' I was laid up for a while with my leg out like this hh=oh
DOC: Did you hurt your knee
PAT: No
DOC: Do you 'member twisting it or bumping it
PAT: No
DOC: Okay
PAT: oh=h
DOC: What hurts hh
PAT: Thuh whole knee
DOC: What makes it worse

PAT: When I walk on it er
(x)
PAT: An' then- (x) I'm having all this pain and not bein' able to eat for like three or four weeks because o' my bowels .h I jus' am not feeling well and I don't know what else to do
DOC: Okay
PAT: I been drinkin' a lot o' water
(x)
DOC: So you've had pain in thuh knee off an' on for years
PAT: Yeah but lately it's been really bad it's swollen
DOC: What did Doctor (Yoder) have to say about it when you saw him
PAT: U:m he didn't say much he jus'- he used to drain it he used to drain it and then wrap it an' then put me on crutches
DOC: How would he drain it [put a needle in]
PAT: [some kind o'] needle
DOC: Uh huh
PAT: Yeah some kind o' needle
(x)
DOC: Did you ever have surgery on thuh knee
PAT: Um no
DOC: An' have you seen anyone else who's drained it or taken care of it that way (x) 'kay
PAT: I tried ta get in there but they won't take me
(x)
DOC: And you said you haven't been able ta eat for several weeks
PAT: Yeah every time I eat it goes right through me
(x)
DOC: Watery diarrhea
PAT: Yeah
(x)
DOC: S'it wake you up at night
PAT: No
DOC: Any blood in your stool
PAT: No
(x)
DOC: Okay
PAT: Also I wanted ta tell ya I don't know if I told ya but with my knee like this I been falling my legs were givin' out under me
DOC: Mm okay

(x)
DOC: .tch how often is that happening now
PAT: Oh it's happening a lot I almost slipped and fell in thuh tub several times
DOC: So it happens every day
PAT: Yeah about
(x)
DOC: How 'bout just walking along on thuh level will that do it too
PAT: This is (well) [jus']
DOC: [Well] le'me
PAT: Painful
DOC: Let=me check your knee first h can we slip your uh boot off
PAT: Yeah
(x)
DOC: You okay
PAT: (yeah ma socks) comin' off
DOC: That's okay (x) get it over your foot here why don't we take your other boot off so (where) I can check both knees
PAT: Oh=hh
DOC: Still raining out there
PAT: No=h
DOC: Oh it stopped
PAT: Yeah
(x)
DOC: Put this over here
(x)
DOC: Okay (I'm gonna) ask you to lay back here
PAT: Okay
DOC: Put your feet up on thuh ( ) like so you alright
PAT: Yeah
DOC: What's this scar on your leg [from]
PAT: [I had] a (bi palmer) tumor removed
DOC: Oh okay (x) I'll check your other knee it's always helpful to compare thuh two knees together
PAT: Yeah
DOC: 'Kay let's I wanna bend thuh good knee
PAT: Uh huh
DOC: I just wanna feel your knee as we move it
PAT: Oh wait 'til you feel thee other knee you'll
DOC: This one feels okay did you fall and hurt your

knee at some point
PAT: Nope
DOC: You don’t remember any kind o’
PAT: Huh uh
DOC: Injuries at all
PAT: No
DOC: Well Doctor (Yoder) hh passed away about s:ix years ago maybe seven
PAT: Yeah
DOC: So it’s been a while since you would have seen him (x) s’that bother you
PAT: An’ sometimes when I’m- walkin’ down steps I get this feeling like it’s gonna snap
DOC: Just let your leg relax (x) where do you live now
PAT: Uh: governors gave
DOC: Do you have uh a roommate
PAT: No
DOC: You live by yourself
PAT: Yeah
DOC: Does anyone come and check in on you
PAT: No
DOC: Are you working now
PAT: Oh no I couldn’t work in my condition
DOC: Okay so you don’t work through skills or anything like that anymore
PAT: No
DOC: Are you seeing any other doctors for any other problems
PAT: No
DOC: Okay you can sit back up
(x)
DOC: So you’re still on disability
PAT: Yea
(x)
DOC: See which (x) still take thuh (Lemactol)
PAT: Yeah
DOC: (Efexer)
PAT: (Efexer) [yep]
DOC: [(Tricor)]
PAT: Yep
DOC: Uh (Zanex)
PAT: Yep
DOC: (Darvaset)
PAT: No
DOC: You not taking (Darvaset) anymore

PAT: Well=I- (can) taking it but i'- hasn't been helping thuh pain
DOC: Okay (x) still taking (Rhemoran) h
PAT: Yes
DOC: (Zypracsea)
PAT: Yes
DOC: An' (Trasydone)
PAT: Yes
DOC: An' (Welbutron)
PAT: Yes
DOC: 'Kay .h who prescribes those medicines for you
PAT: Uh: Doctor (Navaby)
DOC: (Navaby) okay yes I do have his name here .h and you see Doctor Roy about your migraines and about thuh seizures
PAT: Yeah
DOC: 'Kay (x)
DOC: `Kay h well- h in regards to your knee hh you don't have any fluid in there right now from what I can tell .h um (x) I feel a little gritting as we move it [I think]
PAT: [Yeah:]
DOC: You probably have some arthritis in='ere I'm sure it's been goin' on for quite a while .h but there's no fluid in there that I think that would help to you know put a needle in 'n' take thuh fluid out
PAT: Oh
DOC: .h um we have a couple of options what I can do is um um ask you to get an x ray here an' see what they say about thuh bones and thuh joint an' how it all looks .h thee other option would be for me to arrange for you to go see an orthopedist I don't believe your knee has worn out enough that we're talking about surgery or we're talking about a knee replacement I think you just have some inflammation in thee tendons around thuh knee and that's what's causing your pain
PAT: Mm
DOC: You may have a little bit of cartilage inside an' that would make the knee joint feel like it might give out on occasion
PAT: Yeah .h ah:
DOC: Why don't we=a do this why don't we x ray thuh

knee here today
PAT: Okay
DOC: ‘Cause t for me ta get you into thee orthopedist
it may be awhile
PAT: I know
DOC: We’ll get some blood test done too an’ just make
sure everything else looks normal ( ) um (x)
DOC: .pt [A::nd hh
[((Doc turns towards computer))
(7.0)
DOC: Have you ever taken (3.5) any of thee
anti inflammatories.
(2.0)
PAT: Uh (x) I don’t think so
(x)
DOC: Like IB Profen or Naproxen
PAT: Oh yeah
DOC: Do they’s- those help at all (x) what would
prob’bly help you thuh most is some physical
therapy ta strengthen thuh muscles I have a
feeling you’ve been favoring thuh leg an’ that
uh you don’t have thuh same kinda strength there
an’=that’s because it hurts so
PAT: It’s jus’ th’ I’m in a lot o’ pain
DOC: Mm hm
PAT: I been doin’ a lot of physical therapy too
DOC: .tch oh you have
PAT: Ohho yeah
DOC: ‘Kay
(x)
DOC: Have you talked to Doctor (Nabavy) about thee
amount of pain an’ discomfort you’re having
PAT: No I don’t see him ‘til next week
DOC: Next week
PAT: He’s my psychiatrist I doubt he’ll
DOC: Yeah but thuh- any o’ thuh pain medicines I give
you I have to be aware of what in’eractions
there are with your other medicines (x) let’s
get thee x ray an’ thuh blood test done an’ see
what they show (x) an’ then I’ll see you back in
a few days an’ we can talk about what your
options are
PAT: Okay
DOC: I’m just gonna go ‘head an order a couple blood
tests an’ thee x ray then
PAT: hh

(x)
DOC: An’ (now) let me look here an’ see what kind of blood tests we’ve done in thuh past here
(xx)
DOC: An’ let me also order an x ray we can do all these today
PAT: Alright
(x)
DOC: I don’t see that you’ve had an x ray in quite a long time is that right
PAT: Yeah
(x)
DOC: Okay now tell me about your diarrhea
PAT: (Phewf) h
DOC: It’s all thuh time
PAT: Yeah
(x)
DOC: Everyday
PAT: Yeah
DOC: Do you get constipated at all
PAT: No hh
DOC: An’ how many times a day are you moving your bowels
PAT: (Sheew) h
(x)
PAT: h (ewf) h pretty much a lot like every time I eat
DOC: Three times four times a day
PAT: Four or five
DOC: S’it depend on what you eat
PAT: Nope I’ve been watching what I eat
DOC: An’ how long’s this been goin’ on for
PAT: ‘Bout three t’ four weeks
(x)
DOC: Any blood in thuh stool (x) and uh you’ve had- a history of an irritable bowel for some time
PAT: Yeah
DOC: An’ you’ve seen Doctor (Mendetta) for that
PAT: Yeah
DOC: (Gastroaneurologist) .h and uh (x) you had your gallbladder out five or six years ago still smoking
PAT: Yeah
DOC: Do you drink much coffee
PAT: No
(x)

DOC: Ever have a colonoscopy done
PAT: No I don't- well I don't know
DOC: Did Doctor (Mendetta) do a colonoscopy it would been done at thuh hospital
PAT: I don't I don't think I don't know
DOC: Can't remember h I don't have anything listed here so it hasn't been done in thuh last three years it might have been done before that maybe not you're fairly young so you may not have done
PAT: He doesn't think I need one because- him and Doctor (Heathcliff) said I have irritable bowel syndrome and something when my intestines tubes er is like
(x)
DOC: Narrowed
PAT: No it's (x) wide
DOC: Okay so you may never have had a colonoscopy done
PAT: Alright
DOC: Is there any particular food that seems to aggravate your diarrhea
PAT: hh
(x)
PAT: No
DOC: No matter what you eat that seems ta- .h so soon after you eat you feel thee urge you gotta go thuh bathroom
PAT: Mm hm
DOC: And you'll have a large watery stool
PAT: Yeah I've had an accident already
DOC: Oh okay (x) um you have to be careful then about leaving thee apartment
PAT: Yeah
DOC: You don't like eat out then
(x)
DOC: Okay
PAT: I don't have much of an appetite because of it
DOC: Really you've lost any weight
PAT: Yeah
(x)
DOC: Oh it's not been too bad your b you've been in within twenty pounds for thuh last three years here okay (x) do you take anything like Metamucil or Citrucel
(x)
PAT: I take Imodium

DOC: Just Imodium .h well you know one o' thuh classic treatments for irritable bowel is ta take um some fiber like Metamucil or Citrucel everyday thuh reason for that ma'y people take it because their constipated
PAT: Yeah see I don't wanna end up goin' any more than
DOC: But what Metamucil and Citrucel does is for people with irritable bowel it seems to even out thuh bowel movements you may still have two or three a day .h but they won't be as watery thee- Metamucil and Citrucel absorb water and give a little form to thuh stool so you may find out that it um it actually makes things better you'll still have frequent bowel movements [maybe even]
PAT: [yeah:]
DOC: Two or three a day .h but they'll be more normal (x)
DOC: Now it takes a while for that to happen an' thuh first few times you take Metamucil you may find that (it) may think it's making it worse but if you hang in there for a few weeks it'll I think make it much better for you
PAT: 'Kay
DOC: Let me write you a note about how I'd like you to take it what we'll do is we'll start real slow and just gradually work you up oh to a full dose over a few weeks
PAT: Alright
DOC: Okay .h thee other=thing is milk an' milk products do you notice if that makes- your diarrhea worse (x) glass o' milk
PAT: I drink lactate milk
DOC: Oh you do 'cause many people have lactose um or lactase deficiency they're intolerant of lactose (x)
DOC: Let me write down how I'd like you to start thuh Metamucil an' we'll have you take it just once a day
PAT: Okay
(xx)
DOC: Okay (x) how 'bout if I see you back in two weeks we'll talk about how your bowel movements are doing (x) in thuh meantime you'll- can get some blood tests an' x rays today (x) I'm

checking you for a var variety of uh kinds of arthritis that could be aggravating your knee gout an' rheumatoid an' lupus and all those things

PAT: Alright

(x)

PAT: So what=do I do about thuh pain in thuh mean time

DOC: Well

PAT: I been cryin' (x) [that's how]

DOC: [I need]

PAT: Bad it has

DOC: I need ta talk to (Navaby) (x) I know every time you've been in you've been asking me about pain pills thuh last few times (x) .tch and I'm a little reluctant ta get started down that route without talking to him first I can refill thuh (Darvaset) for you (x) or um d=you ever take (Altram) (Altraset)

PAT: (Altram)

(x)

DOC: That may give you some relieve

PAT: Yeah

DOC: You did take it

PAT: I think I've taken it b'fore

DOC: I didn't see it here

PAT: Not sure

(x)

DOC: No you haven't I don't see here oh you had (Altraset) .tch though that was a year ago you wanna try that again

PAT: (Altraset) yeah

(x)

DOC: I'll give you a refill on that then

(x)

DOC: Have you tried any o' thuh (Linaments) oh your knee

PAT: Fer huh uh

DOC: Like heat

PAT: Oh yeah

DOC: Or formula four fifty four you th (there) different kinds you can also try those

(x)

DOC: Okay

PAT: Alright

DOC: Let's get an x ray let's get blood tests done

make sure there's nothing more sever going on
let's have you start taking thuh Metamucil and I
wrote out how I'd like you to take it it's half
a teaspoon and a half glass a water for a week
an' then f level teaspoon for a week an' a glass
a water an' a heaping teaspoon and a glass a
water (x) so sl- kind of slowly work up ca- it
absorbs water it'll give some form to your stool
(x)
DOC: An then I'll see you back an' we'll go over your
blood tests and x rays (x) okay need some help
there
(x)
DOC: I'm gonna walk out an' get your prescription go
ahead and get your shoes on there and I'll be
right back
PAT: Alright
(x)
DOC: You okay there Tracy
(x)
DOC: This is thee (Altraset) hh
PAT: Alright
DOC: For thuh pain go head on out to check out an'
then they're gonna send you upstairs for thee
x rays and blood tests
PAT: Okay

Appendix D - Pre-interview Survey Questions

Patient Survey

1. What is your name? (This is only to identify the survey for the interview, all identifying information will be removed.)

2. What is your gender?
   Male
   Female
   Other [write in]

3. What is your age?

4. Do you have a primary care physician?
   No
   Yes (please specify how many years you have been with this physician)

5. On average how often do you visit a primary care physician?
   3-4 times a month
   1-2 times a month
   4-6 times a year
   0-3 times a year

6. How long has it been since your most recent visit with a primary care physician?
   Less than one month
   At least 1-3 months
   At least 4-6 months
   At least 7-9 months
   At least 10-12 months
   At least over a year

7. What are some of the characteristics or features you look for when choosing a new physician?

8. Overall, how satisfied or dissatisfied were you with your last visit to a primary care physician?
   Very satisfied
   Somewhat satisfied
   Neither satisfied nor dissatisfied
   Somewhat dissatisfied
   Very dissatisfied

9. Can you briefly explain why you were either satisfied or dissatisfied?

10. In your opinion, out of all of the personnel that you interact with during a visit, who do you believe has the most influence on the quality of your experience?

Receptionist
Nurses
Physician
Other [write in]

11. Out of all of the stages of your visit with your physician which is the least enjoyable?

Making the appointment
Signing in and filling out paper work
Time spent in the waiting room
The interaction with the nurse
The interaction with the physician

12. Using a scale from 1-7, where 1 is very unfriendly and 7 is very friendly, how friendly do you find your physician?

13. Using a scale from 1-7, where 1 is poorly and 7 is excellent, how well does your physician explain information to you?

14. Using a scale from 1-7, where 1 is not important and 7 is very important, how important is it to you that your physician consults you in treatment options and decisions?

Using a scale from 1-7, where 1 is never and 7 is always, please answer the following questions.

15. How often do you express additional concerns beyond the primary reason for the examination to your physician?

16. How often do you feel that your physician listens to all of your concerns?

17. How often do you feel that all of your concerns are resolved or addressed?

18. How often are you confused by your physician's actions during the examination?

19. How often does your physician keep you informed to what he/she is doing during the examination?

20. How often do you leave fully understanding your prescribed treatment plan?

Physician Survey

1. What is your name? (This is only to identify the survey for the interview, all identifying information will be removed.)

2. What is your primary medical specialty?
    Internal Medicine
    Family Medicine
    General Internal Medicine
    Other [write in]

3. How many years have your been practicing?

4. What is your primary practice setting?
    Solo practice or small group
    Large practice group
    University/ academic practice
    Other [write in]

5. Please list any fellowship training programs you have completed.

6. Do you follow a particular model of practice? (i.e. Evidence-based, Psychosocial/ Behavioral)
    No
    Yes (please specify)

7. Approximately how many patients do you see per week?

8. Does your practice use electronic health records?
    Yes
    No
    Working on implementing

9. If yes to question ^, what platform do you use to run the EHR?
    Desktop computer
    Laptop computer
    Tablet
    Other [write in]

10. In your opinion, what are a few of the most important influences on a positive patient experience during a visit?

Using a scale from 1-7, where 1 is strongly disagree and 7 is strong agree, please answer how you align with the following statements.

11. A patient's experience during a visit (positive or negative) can affect their dedication to the prescribed treatment?

12. A physician's role is primarily to treat disease and ailments, not to address psychosocial concerns of patients.

13. A strong relationship between patient and physician is an extremely valuable therapeutic intervention that leads to improved treatment outcomes.

14. Physicians should at least verbally address all voiced concerns from the patient.

15. Physicians should consult the patient when making decisions about treatment options.

16. Physicians should attempt to educate the patient about their condition, not just prescribe a treatment.

17. It is important for a patient to have access to their own health record?

18. Patients should be encouraged to participate in their own health record.

Appendix E - Follow-up Interview Questions

Patient Interview Questions

Hello, today I'll be interviewing you as a follow-up to your pre-interview survey that you filled out. In this interview, I'll be asking questions interactions between physicians and patients and how interactional aspects affect the patient's experience.

This research is for a chapter of my graduate thesis in communication studies.

If it's ok with you, I'll be audiorecording our conversation today. The recording will be transcribed and all names and identifying information will be removed.

Questions about self
To start off I would first like to ask you some questions about yourself and your past experience as a patient.

1. From the pre-interview survey, you said that you were [satisfied/dissatisfied] with your last visit, and you stated [answers] were some reasons why. Could you elaborate on your response?
2. From the pre-interview survey, you said the least enjoyable stage of the visit is [answer]. Why is that?
    1. What is your most enjoyable part of the visit?
3. From the pre-interview survey, you said that [answer: if positive 1, if negative 2]
    1. You feel like your physician listens to all of your concerns. How do you feel that affects your experience and health?
    2. You feel like your physician does not listen to all of your concerns. How do you feel that affects your experience and health?
4. From the pre-interview survey you report that you were [answer] confused by the actions of your doctor. Why is that?
5. You stated in the survey that your physician is [answer] at explaining information to you. Besides your physician what sources of information are made available to you?

Questions about doctor
I now have a few questions about physicians.

6. You indicated that you believe the [physician] has the most influence on the quality of your experience. Why is that?
7. In your opinion, what is the responsibilities of the doctor during the meeting?
8. What do you believe are the doctor's goals for the meeting?

Questions about space
I would now like to ask you a few questions about examination rooms.

9. Could you sketch the arrangement of a typical exam room?
10. In what ways could you imagine that the room affects the meeting?

11. Could you sketch your id`eal exam room? Can you tell me about it?

Discussion about clip MC-20-09-a (0:00-4:00) or MC-6-10 (0:00-3:40)
Lastly, I would like to hear some of your thoughts on a video clip of an actual interaction between a physician and his/her patient.
From what you saw:
12. How successful do you believe this exam was? Why?
13. In your opinion, what did you think of the physician?
14. What suggestions would you make to improve the exam?
15. If you were the patient how satisfied would you believe with this meeting?

Thank you for your time, before we end this interview do you have some other comments you would like to make about any previous experience?

Physician Interview Questions

Hello, today I'll be interviewing you as a follow-up to your pre-interview survey that you filled out. In this interview, I'll be asking questions interactions between physicians and patients and how interactional aspects affect the patient's experience.

This research is for a chapter of my graduate thesis in communication studies.

If it's ok with you, I'll be audiorecording our conversation today. The recording will be transcribed and all names and identifying information will be removed.

Questions for Physicians

To start off I would first like to ask you some questions about yourself and your practice.

1. How would you describe your responsibilities while meeting with a patient?
2. How would you describe the patient's role during the meeting?
3. From the pre-interview survey, you [survey answer] with the statement that a physician's role is primarily to treat disease and ailments, not to address psychosocial concerns of patients. Could you expand on your answer?
    1. How often do patients express non-biomedical concerns?
    2. How do you typically respond to these?
    3. How do you believe this affect a patient's overall health?
    4. Do you record psychosocial concerns in the patient's file?
4. What is your understanding of patient-centered care strategies, and how are they used in your practice?
    1. What difficulties, if any, result from patient-centered care strategies?
5. In the survey you said it is (answer) for a physician to attempt to educate a patient on their conditions. Could you elaborate on how you do this?

Questions about EHR
If yes to survey question.
6. When did you practice switch to EHRs?
7. What were your reasons for switching?
8. Why does your practice use (answer from survey) as the EHR platform?
9. Can you tell me about any training for using EHRs that you received?
10. How do you use the EHR while with a patient during an exam?
    1. Do you share information with the patient?
    2. What other sources of information are made available to the patient?

11. How do you take your notes? (during the exam, after, end of day)
12. Does the patient have access to their EHR? If so in what form/how?
    1. If yes, how have you seen patients using their records?
13. What issues have you experienced with EHRs?
14. What changes would you like to see made to your current EHR system?
15. What other equipment do you use in the exam room, and for what purpose do you use it?

If no to survey question.
6. Is there a reason why your practice doesn't use EHR?
7. Do you think your practice will implement EHR in the future?

Questions about space
I would now like to ask you a few questions about your work space, specifically the examination room.
16. Could you sketch the arrangement of a typical exam room you work in?
17. In what ways could you imagine that the room affects the meeting?
28. Could you sketch your ideal exam room? Can you tell me about it?

Thank you for your time, before we end this interview do you have some other comments you would like to make about any previous experience?

Appendix F - Interview Transcripts

Patient 1

This interviewee is a 23 year-old female college student. She has been with her primary care physician for one year and visits the physician 1-2 times a month. She last visited her doctor less than a month before the interview and reports that she was very satisfied with the visit.

QF: Quinton Fletchall
P1: Patient

QF So, um today I'm just going to be asking you a few questions about your previous experiences with um interactions with your doctors prima- primarily your [primary physician. um and um kind of touch up=

P1 [primary ((laughs)) Okay

QF =on some of the things and elaborate on your pre-interview survey. So first I would just like to ask you some questions um reflecting on yourself. So from your interview, um your pre-interview survey, you said you that you were very satisfied with your last visit, and stated that um it was great communication, and professional relationship, that he listened to you, he answer a lot of your questions if not all, and he was not condescending or patronizing in any way, um besides those could you elaborate more on how that was a positive experience for you?

P1 Ah you mean like specifically with the last visit or like overall?

QF Or in general [with that doctor.

P1 [in general

P1 Okay so {Doctor Smith} is super cool I guess he has like a smaller practice out in {Dansville}. And he has actually said to me a couple of times that like we are a family or that we are a team. Um and so he's very interested in making sure that I feel like I have agency within like what's going on medically, Um so he make sure to explain things throughly and you like he- a- a couple of times I have been super upset um and he always make sure to like give me hugs and stuff. And he- he's just a really sweet like man. I think he invited me over for like Easter one time because he found out I wasn't going home for Easter like he jus- ((pause))

QF So you would say that he is very atuned to your not only your biomedical needs but your ((pause))

P1 Emotion needs [too mhmm

QF [Emotions needs and that he catches on to that and addresses it.
P1 Yup, definitely.
QF Okay.
QF So also from your interview you said that your least enjoyable stage of the visit is booking the appointment. Now could yo- why is that?
P1 That's just because it's a pain in the ass. Like you have to call and then try to fit it in with your schedule [and its <u>not</u> because of the personnel. The
QF [mhmm
P1 personnel at {Doctor Smith's} office [are fantastic, unlike some other offices
QF [mhmm
P1 I have been to. But um its just like the most boring time consumming part.
QF mhmm
P1 And the wait is never really bad there either.
QF Could you walk me through what a typical experience is like going to that office?
P1 Like calling to make the appointment?
QF Yeah so kind of start with you calling to making the [appointment=
P1 [Yeah wel-
QF =and then when you arrive on that day.
P1 So when I call to make an appointment like you get the standard like oh "welcome to {Smith Medical}" whatever whatever. And then usually once they hear my voice or my name the front women recognize me. We have a good rapport and then so like book an appointment and kind of chat and joke around. Um and then when I show up like I don't usually need to sign in because they recognize me um they'll- like they will ask me how I'm doing. And so we will make small talk and talk about places to get our hair done and stuff you know. Um. And then you just sit in the waiting room and I really interact with the other patients so much. Um. And the wait is never usually that bad. If it- if it is bad- its never really been that bad. Um. Its a pretty small waiting room. Ah sometimes you know the- one of the nurse will take you and like weigh you do all basic, take your blood pressure and your temperature and stuff in like a different room. And then you wait there for a while by yourself. Which that bit kind of sucks because you're just waiting in this room by yourself. Um.
QF Waiting in an exam room [for either the [nurse to come back or the doctor
P1 [Yeah [for the doct- for the doctor to come see you and then tha- that's when can be lik- sometimes he's there real quick

and sometimes it takes a while depending how he is finishing up with another patient.

P1 So.

QF So from that experience what is the most enjoyable? You kind of pointed out that the booking of and then waiting [can be the [least enjoyable.

P1 [Yeah [Yeah

P1 Uh I really like interaction with everybody in the office like um I'm on a first name basis with most of them because I'm there so often ((laughing)) Um. So it's just fun. Um. They do feel like a- like a sort of family or like a team um because there is that familiarity. Um. And I really enjoy my interactions with {Smith} he's phenomenal, he's great. He is- You feel shitty going because you feel sick or whatever or your like worried about something and you always come out feeling a lot better about it and a lot more assured.

QF So from your- what you're telling me now and your survey you have said that the staff and especially your doctor have been very open listening to you [and personable to your needs. How do you see that relates into your=

P1 [mhmm

QF =larger health concerns and your- and how does that affect your health?

P1 Well I think ((pause)) Um. I think there is very strong correlation between mental health and physical health. Um. And I know specifically to Crohn's um stress can be a real big trigger for flare ups. So having them also address lik- treat you like a human being. Um. Instead of just another patient or another subject or whatever. I think that really helps. Um. And that sense of empowerment and agency and teamwork and collaboration. Um. Also makes you feel like you have more control over something that you're never going to be cured of. So it gives more hope and calms you down. And ((pause)) I feel it helps you get through it because you're not alone and that you do have the power to- get- to make the most of it cit- a shitty ((pause)) pun intended situation. Does- does that answer your question?

QF Yeah.

P1 Yeah.

QF Yeah.

P1 Okay cool.

QF So let's move on to the next part, um, so to speak more about the communication between you and your doctor. [You indicated in the survey=

P1 [mhmm

QF =that for the most part you- you're never really confused by any- what he's [describing to you or his action within the exam room. Have you ever=

P1 [mn nm
QF =experienced moments where you weren't sure what he was doing? Or-
P1 No, not with hi- like there's neve- if- ((pause)) he's really cool in that he- mmm So I have had experience with doctors in the past where they treat you like a child or something like they try to dumb things down for you too much or they will use a bunch of medical aum- jargon and kind of expect you to take and do whatever and they get pissy when you ask them questions. Um. But {Smith} he- ((pause)) always talk- talks me through why we're doing stuff and what we're going to do. Um. And he manages to strike this- this good balance between um using the medical terms but then explaining them in lay terms. Um. But it- it doesn't- it does help that I was pre-med for a while so I know quite a bit like I retained quite a bit so we can talk more on like on a medical level about things. Um. But he also- because I know he's so open to conversation to like to questions I never feel ((pause)) like I can't ask a question if I didn't understand something that's going on. I know he wouldn't get shitty with me or upset he's open to conversation and open to questions and actually encourages questions and talking in depth about things and always mak- like tries to jus- to make sure that I understand. So he's great with following up. Mhmm.
QF So in these moments of discussion um what sources of information are made available to you?
P1 Ahh printouts. He- He will print things out for me if I want them. Um. It's cool now because a lot of- like all of my doctors now they're are staring to do this online portals as well so you can actually check your blood results or test results online. Um. Which can be difficult to decipher without a medical degree. Um. ((pause)) But ((pause)) when you go to see them they- like he'll pr- print them out and he'll go though them and like explain and if you have questions about whether or not this being a high or low thing is a good or bad thing or relates to something else. Like he's really willing to break it down for you. Um. What else has he-? Oh! He's given me ((pause)) so after my surgery last year ((pause)) which this isn't technically information but its kind of cool and I think you'd appreciate it. Um. After my surgery last year it got- like my incision got infected pretty badly and ah he ((pause)) was worried about it ((pasuse)) obviously after I got out of the hospital we needed it to heal properly and so he would have me come to his office everyday for free and he would change- like do the dressing and change the dressing for free and he would give me a lot of sample of like Bacitracin which is I guess like one of the main ingredients in Neosporin but it's a little bit better than Neosporin.

Um. And when I developed like an allergy to regular tape um he would give me rolls of paper tape so I didn't have to go spend money on things at Walgreens. So that's not technically information but um it's mostly oral or- or print outs.

QF So even when that stuff is made available to you is it mostly medi- mediated through him, chosen by him give to you but then also explain through him.

P1 Yeah all of it is through him.

QF Is there information that is presented to you not through him?

P1 What do you mean? Like pamphlets?

QF Yeah.

P1 Ah I mean in his waiting room I don't think there are any pamphlets. I know in like my gastroenteritis's ((pause)) place. Um. And then in my ((pause)) my colorectal surgeon's waiting rooms there's a bunch of um ((pause)) pamphlets and stuff. But usually I don't like them so much because ((pause)) they're alwa- they seem like they are purposely left there for drug reps and there has been a few times when I have been in waiting rooms and drug reps have come in and sat down and waited. I don't know I'm just not crazy about the pharmaceutical whatever. So it feels like more of an advertising space than an information space like a "Choose Cimzia" or like "Choose Humira" which are two different biologics for Crohn's. Um.

((pause))

QF So there is a certain level of trust in the material [coming from him versus=

P1 [Yeah well yeah like=

QF =just the generic.

P1 =the generic- the generic stuff- like and the generic stuff too doesn't go into much depth like cause it is just an advertisement for like "use our medication." Um. Th- the doctor's offices I have been in haven't had their- like they haven't produced their own ((pause)) literature you know. Even when he does give me print outs its usually from like um journals or you know like his- his sources not ((pause)) like pre-made things. Like he'll print it out specifically [for me.

QF [So then he is need to- you kind of need him to decipher certain parts of it if it's coming from m- medical background or

P1 Um not really just because I- I do have like a little bit of a background in stuff and I mean if- if I didn't have a background then maybe but also I mean I Google things or ask him questions and he's also um ((pause)) {Doctor Smith} is pretty rad in the sense that if I have a question I can call him and because I have a good rapport with everybody he'll call me back

between patients and I can ask him questions over the phone about something he has given me or about something I'm experiencing and whether or not I should come in. Ah and sometimes if I'm not sure if I need to make an appointment he'll say just "come in anyways and I'll check you over" and it's like free like "don't worry about making an actual appointment like I'll just fit you in around everyone else." So that's usually when its a longer wait is if I have to go and I don't actually have an appointment. Um. But even then it's not usually a long wait.

QF Um. I would like to move on [to some new questions. So these kind of=

P1 [yeah yea- yeah

QF =relate to your doctor. Um.

P1 Mhmm

QF So the first one is in your opinion what are the responsibilities of your doctor in the interaction.

P1 In the interaction?

QF Mhmm

P1 Um. ((pasuse)) I think that ((pause)) this this is difficult. Um. ((pause)) Having experienced doctors that ar- are really shitty at interaction and doctors that are good at interaction I think that interaction is huge a part of a doctor's responsibility because they are a mediator between the wealth of medical knowledge and what's going on with your body and a lay person so I think there needs to be that translation. You know? And not just see a problem ((pause)) Not to treat a patient as like an object or a problem that needs solving and then they just solve it by theirselves. But I think it should be a more collaborative empowering kind of ((pause)) like "I'll explain to you what's going on and then we can troubleshoot this together, like here are your options" you know like does that make sense lik- like a translator kind of ((pause))

QF Mhmm

P1 Team role I don't ((pause)) I think it should be a humanizing experience I don't think it should be a de-humanizing experience because it's not just ((pause)) the physical that's wrong with people you know usually if you're sick like there's a huge- especially like ((pause)) some kind of chronic illness it- its not ((pause)) just like it's going to go away right its something and so its got a very huge mental aspect to it too and you're going to be seeing these people and working with these people like for the rest of you life so you need to have a good relationship with them. ((pause))

P1 Communication wise

QF So what do you think he's goals are coming into the meeting?
P1 His goals? Um. Figure out ((pasuse)) symptoms. Um so that he can try to figure out what's going on. Um. For him to ((pause)) him and I have had a couple of conversation because like I- I'll overhear other patients in the waiting room talking about their interactions with him and how they love him and stuff. And so he's actually said to me that he ((pause)) does view his patients as family and so he does like he views his responsibility and on- part of his goals is to get to know them personally an- and relate to them and um ((pause)) And just like talk about life things as well like not too invasive not too personal. ((pause)) But just let them know he's there for them and um that he's willing to facilitate and help an- and adapt in any way that he can t- to make their experience and their lives easier. Um. An- i- he jus- I think primarily just to help. ((pause)) To help I don- like fix you
QF Mhmm
P1 But not in a ((pause)) creepy like you're an object way
QF ((laughter))
P1 ((laughter)) Sorry
QF Um. So a let's go ahead and move on to the third part. Um. Little different um but ((pause)) I would like [talk about
P1 [I like your transitions your transitions are great.
QF Thanks. Ah to talk a little bit more about the physical space. [So um=
P1 [Okay. Yup.
QF =first I would like to ask could you sketch a typical arrangement of one of your exam rooms.
P1 Mhmm.
QF Um.
P1 Do you want me to sketch it next to yours or do you want me to sketch it on mine?
QF On your paper is fine. And just as an example ((shows example)) you know the sketch does not have to be pretty by any means.
P1 ((laughing))
QF Um. To whatever your artist ability and label it how you would want to.
P1 ((Drawing)) Okay so usually I'm going to draw mine bigger than yours. ((Pause))
P1 Because
((Pause))
P1 And oh like there's the door.
((Pause))

P1 Um. And then usually its pretty similar to what you have with like ((Pause)) and then like the sink and there be like a sharps container and like other things for like cotton swabs and stuff and then there be like you know ((Pause)) drawers- like cabinets on top of that.
((Pause))
P1 Um. And then his. He usually has the bed ((pause)) thing actually sticking out and then he has like little side tables ((pause)) and a little chair.
((pause))
P1 Are you going to keep this?
QF Mhmm
P1 Okay. So I'll actually like label things. Um and then he has a chair here.
((pause))
P1 Um- and then usually he actually has um ((pause)) This is where it's interesting because a lot of other ((pause)) pretty much all my other ah doctors offices have their decorations will be like um anatomical you know like posters like labeling different things like"and this what prostate cancer looks like"
((pause))
P1 Um where's {Doctor Smith} his um ((pause)) office is like actually in a- like a house like the bottom floor of a house so it has a very homey feel to it and instead he has like um paintings up um and then he has a bunch of his like his certificates up as well so you know he's qualified and like building ethos and stuff. So that's what his office looks like. Um.
((pause))
P1 I just want to draw you a different office as well because I think the layouts here are important.
QF Yeah absolutely. Thank you.
P1 So this is {Doctor Smith's} and he has pretty pictures up on the wall.
((drawing))
P1 This is my gastroenteritis's office ((drawing))
Oh actually {Smith} doesn't have those shelves. But this- {Smith}- uh but- ((drawing)) he does and then he has his chair here.
((drawing))
P1 He has- which way does his tab- his table thing go? His goes here against the wall like yours ((drawing)) and then he'll have a couple of chairs like here. Um and one of the interesting things that I think is relevant to your study is that okay so- ((pause)) verbally I'm going to speak so it- okay so he has not only the chair next to the like sink and the side where the doctor usually sits

and then you're like usually supposed sit on th- the bed thing weirdly. Um so the first time I ever went to {Doctor Jones}'s office he also has a couple of chairs across from the chair that the doctor usually sits at. ((pause)) and out of habit I went ahead and sat on the bed ((pause)) and when he comes in um he has his laptop cause now the doctors all take their notes on the laptop and pull all your information there. And he put that down on the side next to him and he told um a that I could get off the be- the bed and sit in one of the chairs because he wants to treat me like a human and not like a thing. ((pause))

QF hmm ((pause))

P1 And so now whenever I go see him I sit in the chairs and I found that I'm more comfortable sitting in the chairs now and then like moving to the table if we do have to have an examination because it does feel like you are only like this weird pedestal kind of like

QF An object to be examined.

P1 Right right. So that was a very interesting ((pause)) thing. ((pause))

QF So um from these sketches

P1 mhmm

QF A- as you were just talking here about the chairs and your experienc- your interaction with your doctor. [In what other was could you imagine how=

P1 [mhmm

QF =these rooms inter- affect your interaction of the meeting

P1 Um. Well okay so {Doctor Smith's} room like I mentioned is already um the furniture he has in there is pretty nice the bed is a pretty standard bed ((pause)) but the fact that he has the side tables on either side of the bed kind of makes it feel more like a ((pause)) like a- like a place to hangout almost. And then=

QF =A

P1 Hmm?

QF Are these medical looking side tables or [they kind of fit the home experience?

P1 [No no they lo- they look like a home [and then in like in his ah his waiting room as well its like carpeted=

QF [Okay.

P1 =and like the what is it? I think its like a nice like yellow color in there too and he has some bright colorful like artworks up in there um so its really he's

trying to make it seem like a home or lik- like more relaxing place to be less like sterile and cold and more like warm and welcoming and the same with like the artwork in his like individual rooms as well as having his certificates up and framed so you can know you know like he knows his shit. Um so its a interesting mix of an ethos and pathos thing going on ah.
((pause))

QF How- How ((pause)) in between the two rooms um the different aesthetics of the space how does that kind of relate to you? Do you feel one is more [homey but do you question cleanliness? Do[es-

P1 [Mhmm [No.

P1 I don't question cleanliness at all with {Doctor Smith} um but I think thats part of ((pause)) because I trust him so much. Um and its even though it looks more homey everything is still like- its like these desks in here where its like you can tell they've been cleaned down. Um its not like raggedy homey stuff you know it has a home appeal- like aesthetic but you can tell it's still designed to be maintained. Where in {Doctor Jones's} office it's a lot more of the typical white lino floors like, white walls, like tacky ((pause)) not tacky but I mean like th- the medical posters but they're not even framed they're just kind of like tacked up. Um and then bunch of terrible like "Please wash your hands" or like "Have your medical list like your list of medications ready for your doctor" in like really terrible type and it just looks god awful. And I don't like that office as much as I like {Doctor Smith's} office.

QF Is there any other thing you would like to add about the space and how you imagine it affects the interaction?

P1 Mmmmm
((pause))

P1 Only that it- are we running out of time?

QF ((grabbing something to the side)) No just-

P1 Just keep going? Oh okay ((laughs and coughs))
Only that I- I think that um ((pause)) the cold and sterile ((pause) the cold and sterile look it- li- ((pause)) it makes ya- it makes ya more conscience at the fact that something's wrong with you otherwise why would you be in this doctor's office.
((pause))

P1 You know like its ((pause)) very stereotypical like "oh this is great it looks like a hospital" like it's kind of depressing um.
((pause))

But in {Smith's} because it has that more homey vibe and you know its more warm and welcoming and like I think he actually got like some picture of like his previous patients have painted him or like his kids have painted him whatever hanging up in the rooms as well. You feel more relaxed instantly in there and more at ease and so you're more willing to open up and talk about your experiences and talk about your- your symptoms and- and what's going and how you're feeling. Where in that cl- like cold sterile you kind of clam up because hospitals you know its kind of intimidating and depressing. So.

QF So if you could have the opportunity to customize=

P1 =Do I get to design one now!

QF How would you design your ideal exam room?

P1 Oh my god.

P1 You want me to draw it?

QF However you would like to represent it.

P1 Okay ((drawing)) I think it would be cool ((drawing)) To have your room ((drawing)) and you have your door and I realize my door is going out the wrong way from yours. But obviously the sink is still very important. ((drawing))

P1 I don't mind about that I think that's fine. Actually I kind of prefer that it doesn't have- when it doesn't have the big
((pause))

QF Cabi[nets

P1 [Drawers. Cabi- Yeah cabinets on top I don't know why. ((pause)) I think it looks cluttered an- and it's too much. I like the minimalist but like homey thing. Um.
((pause))

P1 I would like if the chairs were not like that plastic crappy office looking chair thing like if they were ((drawing)) not necessarily like Lazyboys but if they were a little more comfortable I think everyone would be happy.
((pause))

P1 The beds always look ((pause)) just the way the beds look they just ((pause)) look real plastic and I don't like the paper they put over it I feel like they think I'm going to like an incontinent old woman or something=I realize its for sanitary reasons and I realize why its there. But its just really uncomfortable and rustily th- the beds themselves look kind of intimidating like dentist chairs. So like if you could redesign the bed that would be awesome. Um. ((drawing))

P1 And the bed I don't really mind if it's like in the middle of the ro- like not in the middle of room but I mea- you'll be able to see with this painting or this drawing.
((drawing))
P1 Like I don't care so much about that I think this is kind of nice um because its- you don't feel like you're being pushed to the side. Um and I do like having the option to have the little side tables just because I go in with a purse and its nice to actually have somewhere- like I feel like I'm accommodated to put my stuff down somewhere or like when you have to take of your clothes off to put a gown on um because you are having a exam that requires you to be in a gown like you have somewhere to fold up your clothes and put them instead of just dumping them on the ground. Um
((pause))
P1 But then I do really like- something I would prefer if {Smith} did would be to have more chairs maybe.
((drawing))
P1 In his thing. Maybe some plants cause plants are happy.
((drawing))
QF Are these chairs set up a certain way for a certain part of the exam?
((pause))
P1 Ah I think=
QF =Or is it just chairs for you to sit in so you're not on the table
P1 I think a bit of both chairs so you're not on the table um and also chairs so ((pause)) I think they should be f- facing=instead of having like the rea- the reason why I put them kind of in the corner like this its supposed by kind of angled to be like matching so you can like actually have eye contact. Um.
QF Eye contact across the room to the doctor's chair?
P1 Right. Um maybe this is like too big.
P1 Instead of having- cause you know sometimes when you go with a visitor lik- like your parents or something you know the wall- the chairs are right next to each other so you can't even like see the other person. I think it would be nice to have more of a circl- not necessarily a circle but be able to see everybody while you're talking. Um.
((pause))
P1 And I think it would be weird to sit next to the doctor I don't know why ((pause)) that just makes me feel weird.
((pause))
P1 Um.

((pause))
P1 But I also think it's important too, that's another thing I should bring up is non-verbal communication. Um
((pause))
The way {Smith} uses his chair is he'll sit down and he'll put his laptop down and then he'll actually look at you and have a conversation with you for the most part. And he actually has one of his nurses sit in and type the notes while he's interacting with you. And sometimes I- I think he only has female nurses or I've only had female nurses with him. Um sometimes they'll join in with the jokes and the banter and like sometimes he'll teach them stuff but for the most part they are just sitting there but because you know them its fine like it- it's whatever. Um but that allows him to interact with you more instead of focusing on trying to type of everything and look up everything. Where's when I go see {Doctor Jones} he's in there by himself and he- even though he says "I want to treat you as human" like not as whatever he's doesn- he's not as good with non-verbals he'll sit there and like sit there and stair at his computer and type the whole time. ((pause)) which is kind of off putting also. ((pause)) So I think having the chairs to facilitate that but then actually following with [it would be great.
QF [So one thing I haven't noticed then is we'll you said they kind of- {Jones} is it brings in a computer? Um
P1 Yeah they both do.
QF They both do. So ((pause)) where would you place the computer in that if the doctor has to intera- interact with it. Um ideally for you what is that interaction like?
P1 Um ((pause)) I think it would be
((pause))
P1 It makes sense where they put it and they put it on the counter next to them so that you know {Smith} well he doesn't sit down usually cause I'm usually on the table for him so he stands so we're like face-to-face. As- we- he's really tall so he's still above me but its not as you know whatever. Um then if he needs to refer to it he'll go back and do it but like I said there is usually someone else there taking the notes so he can focus on the patient. Um where as with {Jones} ((pause)) it would be nice if he would just like leave it in the background sometimes or even there have been a couple of times were he's trying to look something up and I feel like I can help him look it up and so it would be nice to be able to like share the screen you know ((pause)) like that would be ((pause)) cool ((pause)) to be actually able to see what they are

looking at too
((pause))
QF Excellent. Um so=
P1 =I don't know where that would be like putting the computer
though.
QF Um so the last part of this I would like to share with you um a brief kind of
four minute video [of an interaction. And
P1 [Oh Is this with her big leg
((pause))
QF And then afterwards we'll have a brief discussion.
((start video))
P1 Okay.
P1 I hate this one.

((The following section marks the area within the video's transcript where the interviewee had reactions while watching the video))

26 DOC: O[kay.
P1 ((Laugh))
27 PAT: [And she said I evidently had a mini stroke. Which (.) °I
28 Don't really remember havin[g.
29 DOC: [Grea:t. ((sniff)) Okay,= (
P1 ("Great!" Laugh))
30 PAT: =Didn't know it.
31 DOC: Did you have any other things that you need to talk about
32 today.before we get into that further?
33 (1.0)
34 DOC: Cuz I'll be able to look in here and see (if you) have anything
35 in here on that mini stroke (.) question. (.) Anything else
36 goin' on?
37 (0.3)
38 PAT: No.
39 (0.5)
40 PAT: Miserable.
41 (0.6)
42 DOC: Really,
43 (0.2)
P1 (Laugh)

44 DOC: When'd you see Doctor Stout last.
45 PAT: A:h, couple weeks ago.
46 DOC: Mmkay.
47 DOC; I'm going (get you something) from the Internet.
48 PAT: (Maybe it was a week ago) It has not been long.
49 (1.0)
50 PAT: Unhappy. (.) Just miserable.
51 (4.0) ((Doc typing on computer)) ((Typing Stops))…
52 PAT: Course I guess there's a lot of that going around, huh?
53 DOC: MYeah. Some people are starting to feel better because it's
54 DOC: spring.
55 (0.7)
P1 (She's fishing real hard)
56 PAT: I shou:ld, but I'm no:t.
((Video continues to four minute mark and stops around line 110))
QF All right we'll stop there.
P1 All right that was four minutes and two seconds.
QF So um from that brief clip um first I would like to ask you ah how successful do you believe this exam was[and why?
P1 [Aaaaaah I'm not crazy about that exam for man- ca- can I kind of look at the screen again?
QF Yeah.
P1 So.
((pause))
P1 First of all his body language at the beginning ca- can we can we get like a stil- still of the beginning
QF ((rewinds video))
P1 It's like he's not even facing her like he- his toes he- you can tell he's itching to get to the computer to get this interaction done and he doesn't really look her in the face and the way her chair is set up too its like she's not facing him she's facing straight ahead instead of like at an angle so there's that lack of like- you know if- ((moves chair towards QF)) you know if I'm having conv- that's not how you have a conversation with somebody you have a conversation facing somebody.
((pause))
P1 Also he seemed very disinterested like his feedback signals you know like the "un hm, the right, whatever" like they didn't seem inter- like genuine at all.
P1 Um.

((pause))

P1 And then there was the whole depression thing and maybe she's a basket case and obviously she is struggling emotional and he's just completely ignoring that. Um and then two when he and I- I don't know her familiarity with medical terms I mean if- if she I don't know. But it sounded like when he said "something something something" and she said "what does that mean" and he was like "Oh well it means you'r- you got a- dilation or a constriction in your carotid blah blah blah" he was still using pretty ((pause)) like ((pause)) almost like medical jargon almost so it- so like explain- well your ventricle is ((pause)) um thickening and like does she know what a ventricle is she seemed hesitant like she didn't- she didn't respond back in a way that I felt convinced that she understood really what was going on but I don't think she felt comfortable following up with that question like I feel like he was kind of brushing her off.

((pause))

P1 Um and then when he was just staring at the computer it was a very like hunched over. Like he had blocked off all ((pause)) bodily communication with her and had that very disinterested feedback. Um completely ignored her at some points and just brought the conversation back to "what the other doctor say" or "here it shows this."

((pause))

P1 And like if that was {Smith} like I have brough- like I did- like {Smith} always asks how you're doing ((pause)) but not only like physically but a like mentally as well and when I did tell him that I was like dealing with some depression but I wasn't sure if it was like blah blah blah blah we- he made sure to follow up on that and subsequent whatever an- I and he ended up prescribing me anti-depression and anti-anxiety medication which has help enormously ((pause)) but that just seems very irresponsible on his behalf.

QF So as we started the video you also mentioned that you hate the room could you speak a little about that?

P1 Yeah well white is the worst color ever ((pause)) for a wall ((pause)) it just looks so sterile and like a hospital. Um the bed looks real makeshift and kind of shady. That chest of drawers is like super crammed with a bunch of crap on top. The floor looks of- like it's that weird off white so it looks dirty even though you know its probably not dirty but ((pause)) it just looks like it's too- too much sterilize. The ((pause)) none of the colors go together its terrible and there's like this tacky painting of a hot air balloon which maybe could be nice if it like fit into the room more but it seems like its a cop-out like "oh well

here's our" like shitty cop-out trying to make you feel less depressed about being here while staring at all of this medical equipment right here and this terrible sign that what the hell does that even say.
((pause))

P1 I don't know.
((pause))

P1 And its very cramped too. And that computer is ridiculous. I don't like how that table is out that little- um ((pause)) metal tray.

QF Equipment tray.

P1 Yeah that they wheel in and out.
Um I think having a laptop like my doctors do is a lot better than having a desktop in there because having a laptop enables them to turn the laptop around to show you. Um
((pause))

P1 Like ther- like- there's more flexibility and like you can move it around more than you can with a desktop. And there is no way she could've gotten in there to look at the screen if she wanted to.
((pause))

P1 Um and then like sticking that table out at like that crappy angle makes the room look even smaller.
((pause))

P1 Um
((pause))

P1 And then the weird curtain things I don't know what those are.
((pause))

QF So in- in your opinion um ((pause)) what do you think of the physician as-?

P1 I wouldn't like him.

QF No?

P1 No.

QF So wha- what suggestions would you ((pause)) to- make to improve the meeting and the interaction.

P1 Be more personable, less cold, less sterile, like at least pretend you're interested in ((pause)) hearing about how she's doing. I mean I know that's no- your not- not a councilor ((pause)) but you can at least appeal to humanity some how. Um. ((pause)) Make eye when she asks questions.
((pause))

P1 I felt like when this was- he was like "do you have any more questions- do you have any more que- do you have anymore- is that it- do you have-" like he was

very pushy. Like he was trying to speed through. So like slow down a little like I realize you have a stressful job but its also stressful being a patient ((pause)) its- ((pause)) you're a healthcare giver right. Care is a huge part of that. So fucking show some care.
((pause))

P1 Don't get so absorbed in the computer as well.

QF Um so this sounds like if you were the patient you would not be too satisfied with that interaction.

P1 No. Don't- Also don't ignore symptoms! Like she's trying- is there anything else, well I've been kind of depressed. "Oh well you know it's like spring time and it might be getting better" Well if she having chronic pain ((pause)) like its probably not, I'm sorry now I'm like getting to be a doctor and like whatever but that- that doesn't seem lik- and she's like "oh its been a while and" Did she say something about like her friends dying or being crippled or something? Like and he's just like "Oh yeah that's tough, anyways" Like ((pause)) that just seems kind of shitty to me.

QF ((laughs)) All right. Um well before we wrap this up is there anything else you would like to add, any other experiences you would like to mention?

P1 Umm I feel like I've already taken too long with this interview. ((laughs)) Like I'm taking up too much of your time.

P1 Um ((pause)) not necessarily I think I think got more. Um if I think of anything else do you want me to let you know?

QF Definitely that would be awesome [and if I have any follow up questions=

P1 [Okay.

P1 Oh yeah feel free.

QF Thank you.

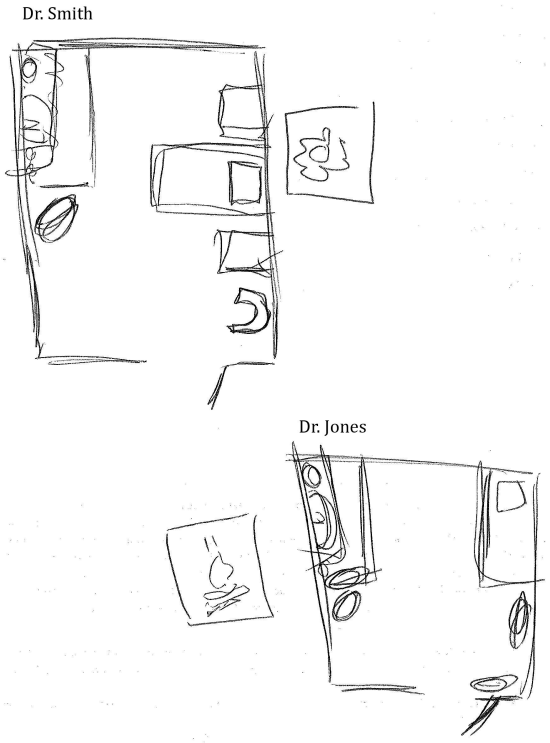

FIGURE 20 - PATIENT 1'S CURRENT EXAM ROOMS DRAWINGS

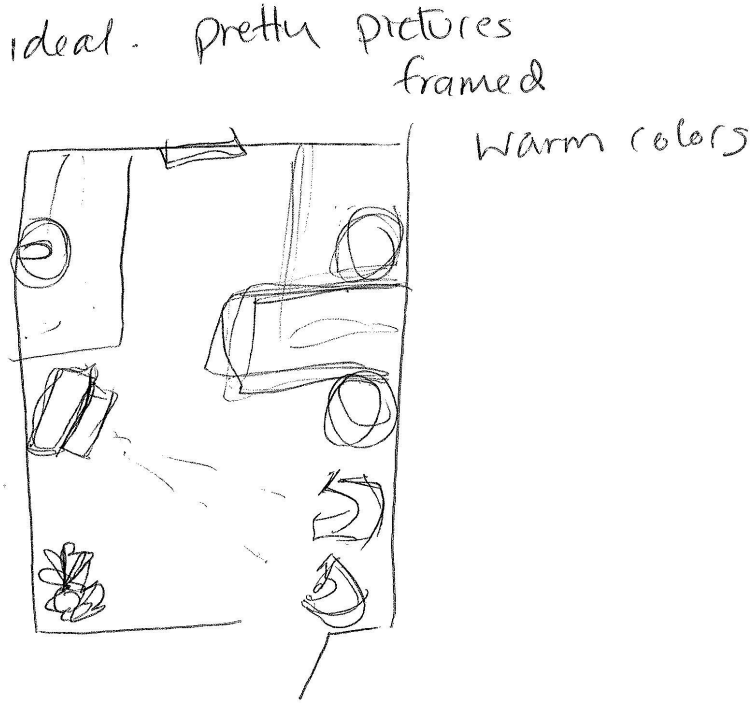

FIGURE 21 - PATIENT'S 1 IDEAL ROOM DRAWING

Patient 2

This interviewee is a 30 year-old male college professor. He has been with his primary care physician for two years and visits 0-3 times a year. He last visited less than one month before the interview, and reports being very satisfied with the last visit.

Interview not transcribed.

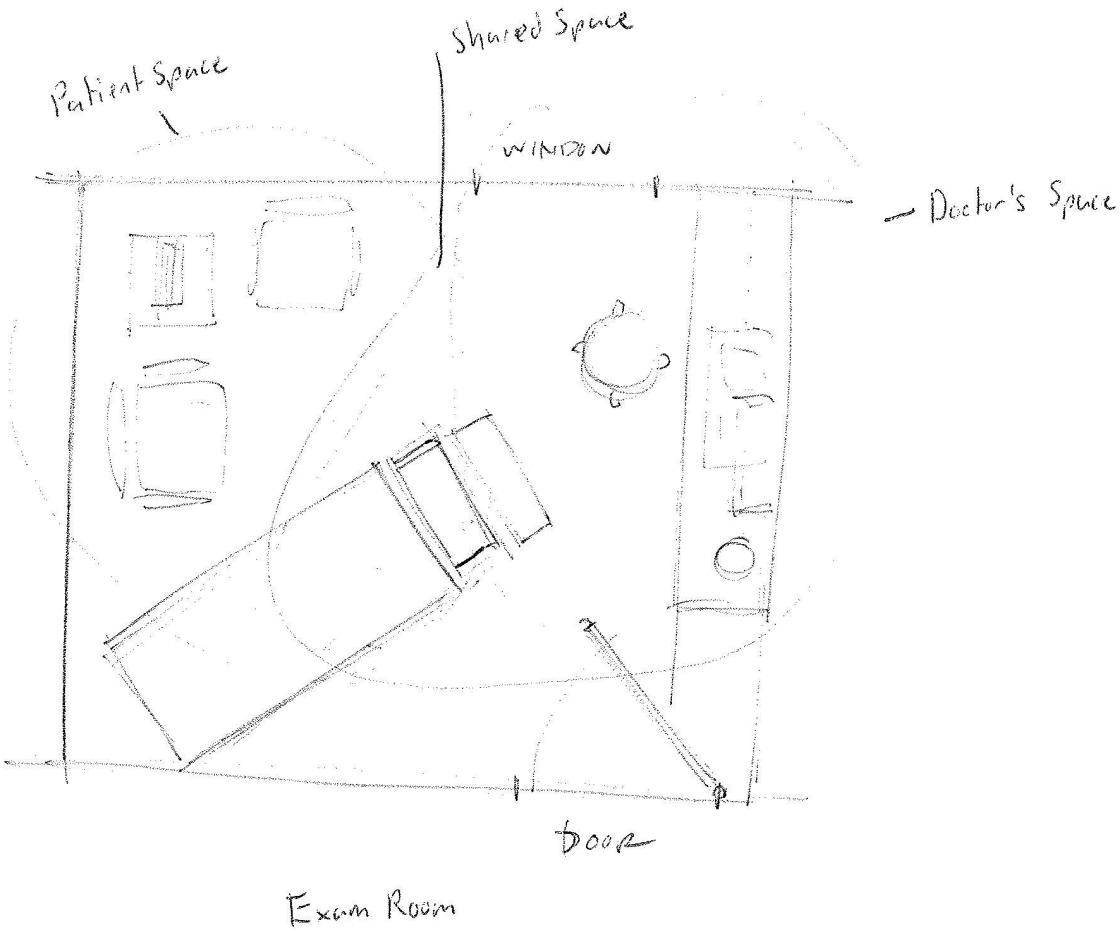

FIGURE 22 - PATIENT 2'S CURRENT EXAM ROOM

See Figure 13 (p.69) for Patient 2's drawing of ideal exam room.

Patient 3

This interviewee is a 58 year-old female office worker. She has been with her primary physician for 12 years and visits 0-3 times a year. She last visited at least 4-6 months before the interview, and reports that she was somewhat satisfied with the last visit.

Interview not transcribed

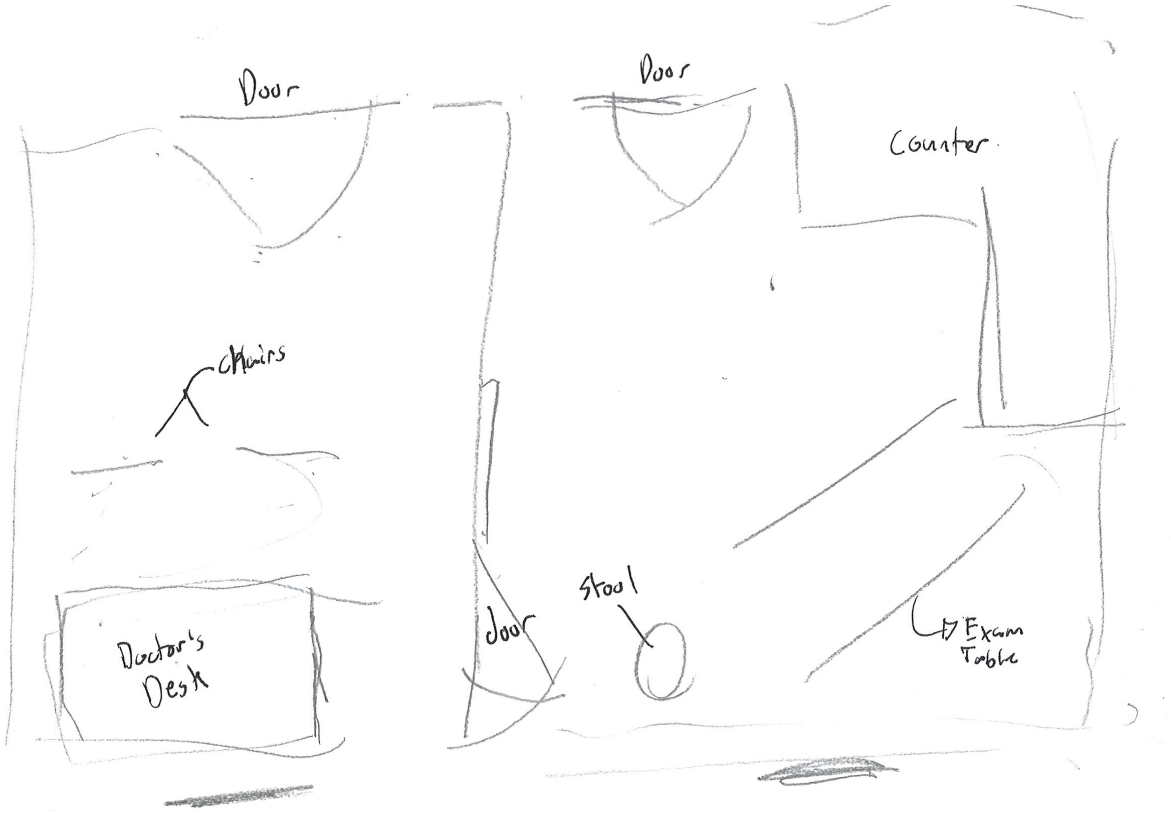

FIGURE 23 - PATIENT 3'S CURRENT EXAM ROOM DRAWING

Physician 1

Physician 1 is female physician who has practiced family medicine for 19 years. She currently works in a solo/ small practice where she sees about 60 patients per week. Her practice currently uses electronic health records via a desktop computer in the exam room.

Interview not transcribed.

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